Crime Prevention Through **Environmental Design** Principles

2006

Peel CPTED Advisory Committee

"The first thing to understand is that the public peace… is not kept primarily by the police, necessary as police are. It is kept by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves… No amount of police can enforce civilization where the normal, casual enforcement of it has broken down."

Jane Jacobs, *Death and Life of Great American Cities*

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Crime Prevention Through Environmental Design Principles

Preface

Since January of 1992, the Region of Peel has examined all site plan applications from a Crime Prevention Through Environmental Design or CPTED (pronounced sep-ted) perspective.

The purpose of this document is to encourage the adoption and application of CPTED principles and strategies by setting out the CPTED criteria by which all applications will be judged.

Acknowledgement

The Peel CPTED Advisory Committee wishes to acknowledge Timothy D. Crowe, Criminologist, whose book *Crime Prevention Through Environmental Design* made this document possible.

The Advisory Committee wishes to acknowledge the work of past members and also the members of the Parking Structures and Schools sub-committees for their work in creating the two new chapters of the Principles document. A list of current and past committee members and sub-committee members can be found on page 62.

Introduction

Background

Since the 1970s, the name Crime Prevention Through Environmental Design has been attributed to the concept that is based on:

- The proper design and effective use of a built environment can lead to a reduction in the fear and incidence of crime as well as an improvement in the quality of life; and
- Its success and popularity can be measured, in part, by its global acceptance and world-wide institutionalization.

Context

This document was produced for the benefit of all non-law enforcement personnel. It is intended to provide the applicant and others with all the information that is required to understand and apply this concept.

The Principles document was never intended, nor could it be expected, to make the applicant an instant expert on “crime” (see glossary). This is very understandable given that few persons have a clear understanding about the true nature and scope of crime and criminal behaviour.

The Need for CPTED in the Urban Design Process

The need for CPTED in the urban design process can be found in the following two statements:

- Crime and loss prevention are inherent to human functions and activities, not just something that police or security people do.
- What we do right or wrong with our human and physical resources produces a lasting legacy.

The Value of CPTED

The value of CPTED is twofold:

- It provides a conceptual framework that helps to support the human activity.
- It provides for ways to reduce our exposure to crime and loss by offering principles that were developed to better design and manage our physical and human resource.

Through the development of this design, crime and loss is kept to a minimum. That is because CPTED believes that crime and loss are by-products of human functions that are not working properly.

CPTED and the Planning Process

The Region of Peel and its municipalities recognize the value of CPTED principles and encourage its integration into the formal planning process in a number of important ways.

- Formal adoption of CPTED principles into the Region's Official Plan and those of the municipalities.
- Establishment of a policy that encourages area municipalities to formally adopt CPTED principles in their urban design guidelines.
- Establishment of the Peel CPTED Advisory Committee.
- Production of a "Principles" document by the CPTED Committee.

The Peel CPTED Advisory Committee

The Peel CPTED Advisory Committee was formed in the summer of 1994 as a result of a Recommendation of Regional Council.

Its mandate is to:

- Develop an awareness, understanding and appreciation of CPTED concepts and principles leading to their adoption and application throughout the Region of Peel.

To provide a forum for the identification and resolution of CPTED-related issues and problems using an interdisciplinary approach to problem solving.

The Committee was formed in co-operation with the Peel Regional Police, the Caledon O.P.P., the Cities of Brampton, Mississauga and the Town of Caledon. Initial Committee membership included Regional Councillors, Regional and municipal staff and police officers. Membership has been expanded to include representatives from boards of education and local crime prevention associations.

As part of its mandate, the Committee developed this document and conducts Crime Prevention Through Environmental Design workshops.

How this document works

This document is composed of both a theoretical overview and a practical concept guide. In order to most effectively incorporate this concept, it must always be remembered that CPTED is but one of the many design objectives that planners and designers must continuously balance.

1. CPTED Emphasis

The underlying objective of CPTED is to help a variety of disciplines, such as residential, recreational, institutional and retail do a better job of achieving its primary objective, with the added by product of improved security and loss prevention. In this regard, it is vital that the intended human activity be allowed to function well. This is best achieved by assigning the human activity a space that can support it, then developing a design that not only contributes to its functional well-being, but supports the control of human behaviour as well.

Emphasis: To develop a design that functions well and supports the intended human behaviour.	
CPTED Objectives	**CPTED Concerns**
Match intended human functions with spaces that can support them (Refer to Section 3 – Space Assessment).	Lands and/or spaces that do not support its intended function.
Designs should ensure that the intended activity has the opportunity to function well and directly support the control of human behaviour (Refer to Section 3.3 – Design Strategies).	Designs that make it difficult for an intended function to work well.

2. Design Strategies

The conceptual thrust of the CPTED program is that the physical environment can be manipulated to produce behavioural effects that will reduce the fear and incidence of crime and improve the quality of life. CPTED strategies that can be used to manipulate the physical environment for the purpose of influencing certain desired, human behaviours include the three overlapping CPTED design strategies of:

- Natural surveillance
- Natural access control
- Territorial reinforcement

Natural surveillance is a design strategy that is directed at keeping intruders under observation.

Natural access control is a design strategy that is directed at decreasing crime opportunity. The primary thrust of an access control strategy is to deny access to a crime target and to create a perception of risk in offenders.

Territorial reinforcement is an "umbrella" design strategy that realizes that physical design can create or extend a sphere of influence so that users of a property develop a sense of proprietorship over it. Territorial strategies will often embody natural surveillance and natural access control strategies.

The conceptual thrust of the CPTED program is towards the exploitation of "natural" forms of surveillance and access control. The term "natural" when referring to natural surveillance and access control, refers to deriving surveillance and access control as a result of the routine use and enjoyment of the property.

Examples of "natural" forms of surveillance include the strategic use and placement of park benches, windows and lobbies. Examples of "natural" forms of access control include the strategic use of distance (e.g. lawns, flooring) and/or topographical features (e.g. creeks, sidewalks) to direct activity or create a buffer between potentially conflicting activities.

Mechanical Forms of Surveillance & Access Control

Other forms of surveillance and access control often used by designers include mechanical forms such as lighting, fencing or gating.

Territorial Reinforcement

Territorial reinforcement is an expression of proprietorship. For example, a clean, well-lit attractive store will present behavioural and environmental cues that tell the "normal user" that they are safe and only accepted behaviours will be tolerated. The same cues have an adverse effect on "abnormal users." The design of space and the way in which people are behaving will give the impression that the abnormal user will be observed, stopped or apprehended.

Territorial reinforcement, together with natural surveillance and access control, promotes more responsiveness by users in protecting their territory.

Section 2.1 Natural Surveillance	
Issues	Design Directive
Does the design allow us to observe?	(a) Design space to facilitate observation by increasing "visual permeability," i.e. the ability to see what is ahead and around. Measure the need for privacy and/or limited sightlines against the need for personal safety. **See Photos 1 and 2.**
Is this level responsive to the needs for observation?	(b) Place vulnerable activities, such as cash handling/child care, in places that can be naturally well-monitored. Develop potential for "eyes on the street" by strategically aligning windows, work stations and other activity generators towards these areas of "vulnerable activity." **See Photo 3**.
Has the need for observation been carried consistently throughout the project?	(c) Take special care to ensure that each phase of the project enhances and complements natural surveillance opportunities created in the design phase. This is particularly critical with respect to the landscaping and lighting phases.

Photo 1: These houses have been strategically designed and placed to maximize observation to the entrance of the streets and the neighbouring homes.

Photo 2: Windows have been incorporated into the interior of the parking garage electrical room. This lessens criminal opportunity by providing for natural surveillance.

Photo 3: Windows have been strategically added to this school stairwell to provide for monitoring from the hallway.

Section 2.2 Natural Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	(a) Provide for "eyes on the street" through the strategic placement of entrances, windows, etc. Direct normal access to observable areas and prevent access to unobservable areas. Design space to provide people with a sense of direction while giving them some natural indication as to where they are and are not allowed (refer to Section 3.2 – Definition) **See Photo 4**.
Will safety be compromised by limiting access?	(b) Provide a limited number of access routes while allowing users some flexibility in movement.
Does the design develop natural access control opportunities without considering their impact on natural surveillance?	(c) Take special care to ensure that natural access control opportunities enhance and complement natural surveillance objectives.

Photo 4: Multiple entrances into this parking lot were replaced by a single, well observed entrance that includes a fence and control gate.

Section 2.3 Territorial Reinforcement	
Issues	**Design Directive**
Does the design act as a catalyst for natural surveillance and access control opportunities?	(a) Enhance the feeling of legitimate ownership by reinforcing existing natural surveillance and natural access control strategies with symbolic or psychological barriers. Accomplish this by demonstrating the transition between public, semi-public and private space so that unwanted intrusion elicits a protective response for offenders. This is often easily accomplished with the strategic use of bollards and signs. **See Photo 5**.
Does the design create ambiguous spaces?	(b) Minimize the creation of ambiguous spaces (a space is ambiguous when it lacks any sort of clue as to what it is for, and who it is for). Accomplish this by identifying potential "leftover spaces", for instance the area between the aboveground portion of a building's underground parking lot and its property line. Then take some positive action to develop this space so that users of the property take responsibility for it.
Will the design create heavy or unreasonable maintenance demands?	(c) Design space to allow for its continued use and intended purpose. Create durable environments that limit the need for maintenance, especially where it affects natural surveillance and access control.

Photo 5: Concrete bollards have been used to define the transition from public to private space.

3. Space Assessment

The CPTED approach to space assessment provides a simple guide for the layperson to use in determining the appropriateness of how a space is designed and used. This approach is based on three functions or dimensions of human space:

- All human space has some designated purpose.
- All human space has social, cultural, legal or physical definitions that prescribe the desired and acceptable behaviours.
- All human space is designed to support and control the desired behaviour.

By emphasizing designation, definition and design, space may be evaluated by asking the following types of questions:

Designation

What is the designated purpose of this space?
What was it originally intended for?

Definition

How is the space defined?
Where are its borders?
Are there social or cultural definitions that affect how that space is used?
Are legal or administrative rules clearly set-out and reinforced in policy?
Are there signs?

Design

What physical design will best support the intended use of space?
What physical design will best provide the means to influence behaviour?

Once a basic self-assessment has been conducted, the "Three Ds" can be examined to help guide the decisions about what to do with human space. These guidelines are presented in the accompanying table.

Section 3.1 Designation	
Objective: Match the intended human functions with spaces that can support them.	
Issues	Guidelines
How well does the space support its intended use?	(a) Assign space according to its ability to support an intended function. **See Photo 6**.
Is there conflict?	(b) Use natural barriers, such as terrain or distance, to physically separate conflicting activities.

Notes on Section 3.1

(a) Assign space according to its ability to support an intended function.

The purpose of this guideline is to match a function's need for natural surveillance, natural access control and territorial reinforcement with a space that can support it.

Photo 6: The interior of this school creates an active, well-overlooked space where students can meet safely.

(b) Use natural barriers such as terrain or distance to physically separate conflicting activities.

The purpose of this guideline is to reduce fear-producing conflict by effectively separating conflicting activities. Effective barriers to conflict include distance, terrain and activities that can be described as neutral or complementary.

An example of a conflicting activity is a basketball court next to a senior's centre. The sounds and action produced from the court can be disruptive and fear producing to seniors.

Section 3.2 Definition	
Issues	Guidelines
Is it clear who owns the space?	(a) Provide clear border definitions of controlled space.
Is there conflict or confusion between the designated purpose of the space and its definition?	(b) Provide clearly marked transitional zones that indicate movement from public to semi-public to private spaces. **See Photo 7**.

Notes on Section 3.2 - Definition

(a) Provide clear border definitions of controlled space.
The origin of this guideline can be found in the common law requirement that space be defined to preserve property rights. Its underlying principle is that a "reasonable person" must be able to recognize that he or she is moving from public to private space.

Fences, certain types of shrubs or signs are examples of acceptable border definition. Border definition can be physical or symbolic.

(b) Provide clearly marked transitional zones that indicate movement from public to semi-public to private spaces.

The importance of this guideline is that users of a property must be made to acknowledge movement into a controlled space. The rationale behind this is that as transitional definition increases, the range of excuses for improper behaviour is reduced.

Photo 7: These townhouse condominiums have used a variety of fence forms to define the transition between public, semi-private and private space.

Objective: Ensure that the intended activity has the opportunity to function well and directly support the control of human behaviour.	
Section 3.3 Design	
Issues	Guidelines
Does the physical design match its intended use?	(a) Ensure that physical space is designed in the context of the needs of the bona fide users of the space.
Does the physical design impede or conflict with the productive use of space?	(b) Design and organize space to allow for its effective use and safe critical intensity of people.
Does the physical design impede or conflict with the proper functioning of the intended human activity?	(c) Identify vulnerable areas, including those with limited natural surveillance, natural access control and territoriality, such as parks or parking areas, and then reduce its risk by improving the distribution of safe activities near them. **See Photo 8.**
Does the physical design provide the means for normal users to naturally influence the activities of others?	(d) Design space to increase the perception or reality of natural surveillance, natural access control and territoriality.
Is there conflict or confusion in the manner in which the physical design is intended to influence human behaviour?	(e) Identify vulnerable activities, such as cash handling and child care centres, then reduce risk by placing them inside areas of strong natural surveillance, natural access control and territoriality. **See Photos 9 and 10**.

Notes on Section 3.3 - Design

(a) Ensure that physical space is designed in the context of the needs of bona fide users of the space.

The purpose of this guideline is to properly match a space's physical design with its intended use. This can best be accomplished by matching the physical design of the space with the physical, social and psychological needs of the space's bona fide users.

(b) Design and organize space to allow for its effective use and a safe critical intensity of people.

It has generally been found that the effective and productive use of space will generate a safe and critical intensity of people that will not only cause "abnormal users" to feel at greater risk (due to greater risk of surveillance and intervention), but will also result in "normal users" feeling and experiencing reduced risk.

(c) Design space to increase the perception or reality of natural surveillance, natural access control and territoriality.

The purpose of this guideline is to emphasize "user friendly" natural forms of surveillance and access control such as windows, clear lines of sight and spatial definition. The reason for this emphasis is to minimize the constraints on the routine use and enjoyment of the property as is often the case when traditional forms of target hardening are used.

(d) Identify vulnerable areas, including those with limited natural surveillance, natural access control and territoriality such as parks or parking areas, and then reduce their risk by improving the distribution of safe activities through them.

This guideline is to be used within reason to strategically distribute "safe" activities through what would otherwise be "unsafe" areas. The benefits associated with this guideline include increased witness potential and challenging or controlling behaviour (e.g. staring). The net impact of these benefits is a greater feeling of safety for "normal" users of the property and a greater sense of risk, scrutiny and intervention amongst most "abnormal users".

Photo 8: A vacant field was replaced by a community garden. This resulted in a significant increase in activity and decrease in crime.

(e) Identify vulnerable activities, such as cash handling or child care centres, then reduce risk by placing them inside areas of strong natural surveillance, natural access control and territoriality.

The purpose of this guideline is to proactively distribute vulnerable activities in the safest possible places. The positioning of vulnerable activities near windows of occupied space or within tightly controlled areas will help to overcome risk and make the users of these areas feel safer.

Photo 9 These photos show a kindergarten play area designed within an unheated interior courtyard of the school. It also serves as a gathering place.

Photo 10

4. Parking Structures

Statement of Purpose

This section is intended to provide a direction for the design and development of new parking structures that are consistent with the best applications of CPTED principles. It is not intended to serve as a checklist or an exhaustive resource.

4.1 Parking Garages

Introduction

Parking structures, whether above or below ground, are often perceived as dark, isolated, confined and confusing places with little protection. As such, they are often regarded as one of the most feared places in urban developments.

As the emphasis is on physical design, non-design elements such as maintenance issues or the use of attendants are not included in the design directives but are presented below.

Mixed Uses

The development of more than one use, or an adjacent mixed use, has the potential of maintaining a critical intensity of witnesses necessary to keep the garage safe.

Wherever appropriate and possible, consider developing complementary safe activities, such as bicycle parking, retail at grade or car washing that will effectively maintain levels of activity while increasing witness potential.

Photo 11: A walkway was developed through this parking structure.

Attendants

Attendants provide natural surveillance, bolster access control and result in a proprietary presence. Attendants themselves may be robbery targets or the victims of disputes. Attendant booths should be visible from the street and have enough glass so that passers-by can see the attendant. They should also be equipped with drop-safes and conduit for closed circuit television.

Reserved Parking Areas

Reserved parking areas should be considered for public buildings where staff members regularly work late. This will reduce the potential for after hours criminal opportunity by minimizing the walking distance and providing superior surveillance opportunities.

Overall Maintenance

Physical changes often precede crime changes. All areas of the parking garage should be kept clean and clear of debris, unsightly material and abandoned cars. Provide for regular maintenance and immediate graffiti removal. Where graffiti is a problem, consider an anti-graffiti coating.

Communication/Alarm System

A properly designed garage will greatly diminish the need for most technology-based security systems that are often irresistible to pranksters. If a communication/alarm system is desired, however, consider developing a series of duress stations no more than 36 metres apart. The duress stations should feature a panic button that is identified by the installation of a constant blue light that changes to strobe when it is depressed or, in the case of a column mounted station, a colour-coded, wraparound ban at the top of the column that includes a reference number. Wherever possible, support the development of the stations with a closed circuit television camera system that is capable of capturing images. The cameras should be motion activated for maximum effectiveness.

Closed Circuit Television Cameras

The decision as to whether to install a closed circuit television system (CCTV) will be dependant upon the ability to monitor the system. Building managers and others often hold an unrealistic expectation as to the effectiveness of CCTV. CCTV should be considered as a complement to security, not as a surrogate for it. Closed circuit television is often hampered by poor quality pictures, improper lighting and a mesmerizing number of mounts. Closed circuit television is most effectively monitored when it results from a motion activated image.

Other Safety Measures

Parking garages bring cars and pedestrians into close proximity. Minimize the potential for conflicts by highlighting pedestrian cross-walks, posting speed limit signs, utilizing traffic calming measures such as speed bumps or ripple strips and warning pedestrians of driveways in proximity to pedestrian exits.

Reconciling Conflicts between Aesthetics, Costs or Security

An absence of CPTED design features will generally result in the need for a more active security system. As the costs of maintaining these systems or retrofitting a property to CPTED standards can be high, CPTED should be considered a priority in design.

In the event of a conflict between aesthetics, costs or security, the level of risk will determine whether the balance shifts towards CPTED.

Signage

Signage required by the building code must be maintained and installed properly. Where supplemental signage is desired, refer to Section 4.1.3 (b) – Territorial Reinforcement.

Photo 12: Design parking structures to maximize visibility and limit hiding spots.

Section 4.1 Parking Garages

Emphasis: Design parking structures to maximize visibility and limit hiding spots. **See Photo 12.**

Section 4.1.1 Surveillance

Issues	Design Directive
Does the design allow us to observe?	
(a) Layout	(a) Design parking areas with clear lines of sight. Layout parking spaces perpendicular to driveways. Avoid angular parking designs that limit the ability of drivers to see into parking areas. Avoid nooks and crannies.
(b) Walls	(b) Avoid surrounding parking stalls with walls. Where shear walls are required, develop openings in the walls to improve natural surveillance. Paint walls white with a reflective paint.
(c) Columns	(c) Utilize round columns to minimize hiding opportunities. Be aware that parking/manoeuvring may become more difficult as the diameter of round columns exceeds the width of rectangular columns.
(d) Ceiling Height	(d) Where possible, maximize ceiling height to create openness and aid in lighting the facility.
(e) Natural Light	(e) Where possible, maximize the introduction of natural light.
(f) Overhead Door	(f) Consider wire mesh or honeycomb, polycarbonate (opaque) doors that allow for natural light and reveal the presence of loiterers.
(g) Utility Rooms	(g) Maximize the use of glass in common walls of utility rooms overlooking the parking area to increase the perception of natural surveillance. The introduction of a glass wall will also facilitate natural surveillance while the room is in use, and limit entrapment and hiding potential.

Lighting Factors	
Issues	Design Directive
Has the need for observation been carried consistently throughout the project?	
(h) Ceiling and Wall Colour	(h) Paint ceilings and walls white and with reflective paint to maximize light output. Consider a white concrete stain for reduced maintenance.
(i) Colour Rendering Ability	(i) Use white light sources to provide reliable colour rendering ability and assist with witness identification. Note: white light sources are generally favoured by members of the public and are CCTV friendly. Fluorescent light fixture efficiency will diminish in cold climates.
(j) Intensity	(j) Ensure the average light level is at least 50 lux with a minimum standard of not less than 11 lux.
(k) Placement	(k) Position lights to principally illuminate parking spaces and pedestrian walkways. Be careful to avoid glare.
(l) Uniformity	(l) Provide sufficient light fixtures to uniformly distribute light throughout the garage, paying special attention to the edges of parking stalls. Good, even distribution can best be achieved by having more fixtures at a lower wattage and using supplemental wall lighting in the areas behind the cars.
(m) Floors	(m) Where possible, retain concrete floors. Use pavement sealer to reflect light output if asphalt is applied.

Cameras and Mirrors	
Is the natural surveillance level responsive to the needs for observation?	
(n) Cameras	(n) Provide for the installation of CCTV at vehicle and pedestrian entrances, attendant booths and longitudinally along key aisles.
(o) Mirrors	(o) Install vandal resistant convex mirrors where blind corners exist and cannot be avoided.

Section 4.1.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	
(a) Logical Design	(a) Create a logical design that will assist first time users in finding their way about.
(b) Compression Techniques	(b) Install control arms at the driveways to strategic levels of public garages to enable sections of the garage to be closed down during prolonged lulls in activity.
(c) Above-Ground Barriers	(c) Screen the first two levels of above ground openings with a climb resistant material that provides for natural surveillance.
(d) Nooks and Crannies	(d) Where nooks and crannies cannot be avoided, screen these areas with a heavy chain link.
(e) Pedestrian Entrance/Exit	(e) Equip perimeter entrance doors, where access is required, with an access control device. Remove exterior hardware for exit only doors. If door designated for emergency use, consider wiring to an alarm.
(f) Protection of Lighting Fixtures	(f) Use lexan covers or wire screens to protect light fixtures against vandalism or theft.
(g) Vehicle Entrance	(g) Concentrate the vehicle entry/exits in a minimum number of locations. Equip the vehicular entrances at private facilities with a card reader. Consider developing a vehicle trap by installing a pre-entry control gate that will physically limit the space between the control gate and the overhead door to a single vehicle. Minimize the amount of time the door needs to safely stay open.
(h) Visitor Parking Area	(h) Physically separate the visitor and employee/tenant parking. Under no circumstances allow uncontrolled access between the two areas.

Section 4.1.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	
(a) Orientation	(a) Colour code multi-level structures with distinctive colours and prominent numbers to aid in orientation and assist in depth of field.
(b) Supplemental Signage	(b) Post all pedestrian and vehicular entrances with trespass notices. **Alert** - regularly post Alert Signs **(See Appendix 1)** throughout the garage. **Exit** - define the path of travel to the nearest exit using Exit Signage I **(See Appendix 2)**. Paint exit doors, frames and sections of the adjacent wall green. Post Exit Signage II on all exit doors **(See Appendix 3)**. Provide information indicating where exits lead, for example, posting maps near elevators. Maintenance - regularly post a phone number to encourage report of maintenance problems or inappropriate behaviour.

Section 4.2 Elevator Vestibules and Stairwells

Elevator vestibules and stairwells are natural extensions of parking garages and must be developed with safety in mind. A properly designed lobby or stairwell will enhance garage safety.

Maintenance

As with parking garages, a physical change can often precede a crime change. Provide for regular maintenance of the stairwell and immediate graffiti removal.

Mechanical Rooms

Mechanical rooms should be designed with full glazing to increase the perception of natural surveillance and eliminate a potential entrapment spot.

Emphasis: Design elevator vestibules and stairwells to provide for the safe movement into, through and away from these structures.	
Section 4.2.1 Surveillance	
Issues	Design Directive
Does the design allow us to observe?	
(a) Doors	(a) Install fire rated doors with glass vision panels, wherever possible.
(b) Elevator	(b) Equip the backs of standard elevators with wall-to-wall mirrors.
(c) Elevator Vestibule	(c) Prominently locate the elevator vestibule so that it is visible to and overlooks the parking garage and, where above ground, can be seen from the public street. Avoid nooks, crannies and jogs near the vestibule. **See Photo 13.**
(d) Stairwells	(d) Develop glass enclosed stair towers. Specify open riser stairwells and balustrades, so that people can see ahead or behind. Avoid open, below-grade stairwells. **See Photos 14 and 15.**
Cameras and Mirrors	
Is natural surveillance level responsive to the needs for observation?	
(e) Cameras	(e) Provide room for the installation of CCTV.
(f) Mirrors	(f) Where jogs or blind spots cannot be avoided, install an angled mirror wall or aluminium convex mirror.

Photo 13: An example of the placement of the elevator vestibule where it is visible from within the parking garage and from the street.

Photo 14: This parking garage was designed with a glass enclosed stair tower.

Photo 15: An example of an open riser stairwell and balustrades allowing for a clear line of vision.

Section 4.2.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	
(a) Stairwell Bottom	(a) Enclose or preclude access to the dead space located at the bottom of the stairs.
(b) Residential Buildings	(b) Control access into the vestibule from the garage. Segregate garage and building stairwells to exit garage stairs directly outside and maximize access control to the remainder of the building.
(c) At-Grade Enclosures	(c) Design at-grade enclosures to protect and give visual prominence to exit stairwells. Avoid placement of these enclosures in isolated areas.
(d) Protection of Lighting	(d) Place lighting fixtures, wherever possible, out of people's reach. Protect lighting fixtures with a vandal resistant wire screen or lexan panel.

Section 4.2.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	
(a) Orientation	(a) Use numbers, symbols and/or a layered, colour-coded technique to assist pedestrians finding their parking level.
(b) Signs	(b) Regularly post a phone number to encourage report of maintenance problems or inappropriate behaviour.

5. Schools

Statement of Purpose

This chapter is intended to provide a direction for the design and development of new schools that is consistent with the best application of CPTED principles. It is not intended to serve as a checklist or an exhaustive resource.

Introduction

Schools have traditionally provided an effective and safe learning environment for our children while anchoring our neighbourhoods as a common meeting place. With ever decreasing resources, schools are expected to satisfy these traditional roles while dealing with such non-traditional problems as irregular shaped lots, increased security demands and parent generated traffic overload.

The development of a new site should begin by completing the space assessment in Section 3. This will assist in locating driveways, parking lots, drop-offs, buildings and playing fields in the spaces that can best support it. Once this is accomplished, the design of the property may begin in earnest. Begin by developing a school design that meets the primary objectives. Support these objectives by designing the building's facade, grounds and future portable placement to meet the intended use.

Developing Designs that Support the Intended Use

While it is now standard school board policy that all visitors must report to the main office, few school designs have evolved sufficiently to support this intended use. To date, this has resulted in a multitude of conventionally designed schools, many of which have poorly overlooked entrances that are potential entry points. In order to resolve this issue, it is critical that school designers pay more attention to the context, function and design of entrances as well as the interior spaces located next to it.

Entry Context

The context of the entrance can be critical to the way it is perceived. A secondary entrance next to a parking lot, will, in the absence of a properly sized and located visitor parking area, draw the attention of visitors and will invite use. The same can be said for secondary entrances next to walkways or desire lines. The closest, most convenient entrance is the entrance that gets used.

In order to guard against this potential, it is critical that the entrances respond to the larger environment. Where walkways or staff parking lots invite use of secondary entrances, the convenience or prominence of these entrances can be negated in a number of ways. These include developing the connection between the main entrance and the walkway, developing the semi-private nature of the staff entrance and its parking lot and/or developing sufficient visitor parking to satisfy visitor demand.

Function and Design of Entrances

Many entrances have a standard presentation that does little to differentiate it from others. If the desired function is egress and the doorway is normally locked, the purpose of the doorway can be communicated by removing exterior hardware. If the desired function includes a limited amount of keyholder access, such as the daily arrival of teachers, consider developing a dedicated teacher entrance directly into the staff-room.

Strategic Development of Adjoining Spaces and facades

Careful planning and design will ensure that activities, windows and school staff are strategically distributed throughout the school next to building entrances. This will increase the perception of risk to offenders by developing witness potential and providing for strong feelings of ownership.

Washrooms for Portable and After-hours Use

Over time, the need for portable and after-hours washrooms accessible to the greater community has resulted in the strategic placement of washrooms next to what would otherwise be remote back entrances. This invariably compromises access control, as these doors must remain open throughout the school day and sometimes throughout the evening. In recognition of this problem, some schools have been designed with a dedicated washroom corridor that can be physically locked after hours to limit access to the remainder of the school. While effective for this purpose, the development of an interior hallway threshold often results in the further isolation of what is already a limited use hallway. As this may have the unintended effect of attracting malfeasance, special care must be taken to design a lockable interior threshold that is normally held in the open position during the school day.

Main Hallway

For the purpose of a school environment, any visitor who fails to conform to the rules should be considered a trespasser. As all visitors are expected to report to the main office and trespassers are expected to avoid this, front office staff must be provided with a design that allows them to routinely overlook the main hallway area even when engaged in their normal duties.

Signage

Signage can play a critical role in highlighting aberrant behaviour. An unsigned secondary entrance that is intended only for egress will often be challenged or circumvented by trespassers because the intended use is not obvious and the rules are not prominently posted. This often results in limited staff challenges as the acceptance of improper behaviour creates its own excuse.

In order to address this problem, the intended purpose of this entrance should be prominently, permanently and clearly marked. This will reduce the incidence of inappropriate visitor behaviour and eliminate an excuse. The wording of washroom signs can be of particular significance. In the situation where an adult offender enters a boys or girls washroom, the addition of the word “only” creates a condition that highlights the impropriety of this behaviour and limits potential excuses.

Risk Management

The proliferation of computers in schools has resulted in a significantly increased risk of break-ins. This has shifted the risk/reward ratio in favour of the thief, which in turn influences the thief's decision to commit a break-in. In response to this increased threat of break-in, schools must decide how to best control their risk.

One of the best ways to manage risk is to extend the offender's escape time by strategically locating high concentrations of computer equipment or other valuable and frequent stolen items, such as musical instruments, away from exterior ground floor walls. This can be best accomplished by selectively locating these items in interior or second floor spaces. Where this is not an option or further security is advised, the development of a target hardened safe room will substantially increase the risk while significantly reducing the reward.

Photo 16: This photo is an example of a property designed to effectively deal with the movement of people onto and through the property.

Section 5.1 School Grounds

Emphasis: Design a property that will effectively deal with the movement of people onto and through the property. **See Photo 16.**	
Section 5.1.1. Surveillance	
Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunities for legitimate users, engaged in their normal activities, to observe the space around them.
(a) Parking	(a) Place visitor parking in an area that can be observed from the main office or other staffed area. Provide direct overlook of staff and, where applicable, student parking from the interior of the school and a public roadway.
Is the natural surveillance level responsive to the needs of observation?	
(b) Kindergarten Play Areas	(b) Locate play areas away from areas that offer concealment.
(c) Play Equipment	(c) Ensure that play equipment can be well observed from the interior of the school and the surrounding neighbourhood both day and night.
Has the need for observation been carried consistently throughout the project?	
(d) Landscaping	(d) Where landscaping is required around the perimeter of the property, select plant materials that do not create a screen. Take special care when planting next to parking lots and the top of berms.
(e) Parking Lot Lighting	(e) Ensure uniform lighting throughout the light. Minimize glare and light trespass by lighting from the perimeter of the property inwards.

Section 5.1.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to unobservable areas.
(a) Visitor Parking	(a) Orient the visitor parking towards the main entrance and away from all secondary entrances. If the visitor parking is not separate, develop a transition between the visitor, staff, and where applicable, student parking.
(b) Staff Parking	(b) Minimize traffic through staff parking areas by locating it on a dedicated parking lot or designated section of a shared facility.
(c) Student Parking	(c) Where student parking is required, designate and define an area and minimize the number of vehicular entry points and escape routes. Develop a parking permit system to provide for the easy identification of visiting vehicles.
(d) Primary Student Drop-Off	(d) Wherever possible, develop drop-off points (e.g. lay-bys) for private vehicles along the main road allowance. Where Kiss n' Ride features are desired interior to the property, consult the City of Mississauga's *Urban Design Guidelines for School Sites* reference notes.
(e) Kindergarten Play Area	(e) Where exterior kindergarten play areas are required, surround the area with a fence and gate. Where possible, use interior courtyards to develop kindergarten play areas.
(f) Rear of School	(f) Limit vehicular access to asphalt areas around the perimeter of the school. Accomplish this by developing pinch points and using retractable barriers such as swing gates or bollards with chains.

Section 5.1.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Develop a transition that indicates the movement from public to semi-private space. Accomplish this with signage and the use of symbolic barriers at property lines or transitional zones. Post easy to read signs at all pedestrian and vehicular entry points. Identify the owner of the property and include a brief trespassing message such as, NO TRESPASSING; TRESPASSERS WILL BE PROSECUTED; PARKING PERMIT REQUIRED; VISITORS REPORT TO MAIN OFFICE. Symbolic barriers can include changes to walkway or driveway textures or the development of islands, raised walkways or bollards.

Section 5.2 School Building Exterior

Emphasis: Design a facade that will effectively deal with the movement of people into and around the building.

Section 5.2.1 Surveillance

Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunities for legitimate users, engaged in their normal activities, to observe the space around them. School buildings should be located close to the street, and the grounds between the school and the street should be clear to give an unobstructed view of the school, both from the street and any nearby houses. Facilitate observation around the perimeter of the building by minimizing alcoves and hiding spots, especially next to doors and windows. Always be cognizant of the main sources of natural surveillance when locating and designing entry points.
Is the natural surveillance level responsive to the needs for observation?	Attempt to match the need for natural surveillance with the available witness potential. Emphasize natural surveillance in vulnerable areas such as secondary entrances.
Has the need for observation been carried consistently throughout the design?	
(a) Landscaping	(a) Where planting is used next to windows or doors, limit the use of plant material to low growing varieties or high branching deciduous trees at a distance that will not allow roof access.
(b) Lighting	(b) Provide consistent, glare-free lighting where the opportunity for witness potential exists. Consider the use of a motion activated, “high/low” (high intensity discharge compatible) lighting system. Avoid installing lights that result in light trespass to surrounding neighbourhoods.
(c) Portable Placement	(c) Consider the impact on natural surveillance when assigning space for portable classrooms (see 5.4).

Section 5.2.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to unobservable areas. Accomplish this by emphasizing elements of logical design and reducing roof access opportunities.
(a) Logical Design	(a) (i) Develop an exterior that naturally queues visitors towards the main entry point and away from secondary entrances. Accomplish this by developing a prominent entrance that's convenient to use in relation to the visitor parking. Limit the obvious presentation of secondary entrances as it relates to visitors arriving by car (see 5.1.2). (ii) Queue secondary "entrance" use by removing all non-essential exterior entry hardware.
(b) Roof Access	(b) Within code requirements, eliminate all methods of access from grade to the first floor roof. Pay special attention to the impact of out buildings and fencing around exterior equipment.

Section 5.2.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Develop a transition that indicates the movement of people from semi-public to private space. Accomplish this with effective signage located adjacent to entrances on the exterior of the building.

Section 5.3 School Building Interior

Emphasis: Design an effective learning environment.

Section 5.3.1 Surveillance

Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunity for legitimate users, engaged in their normal activities, to observe the space around them. Accomplish this by strategically matching areas that require natural surveillance with areas that naturally provide it. Where appropriate, develop and orient counters, doorways, windows and sidelights between those areas offering and requiring natural surveillance.
Is the natural surveillance level responsive to the needs for observation?	
(a) Main Entrance	(a) Create a dynamic entry area that maximizes overlook opportunities from a variety of active sources. This generally includes, but is not limited to, office, library and staff facilities.
(b) Secondary Entrance	(b) Strategically locate safe activities next to secondary entrances. These generally include, but are not limited to, active staff and custodian facilities.
(c) Hallways	(c) Facilitate surveillance opportunities at corridor intersections. Wherever possible, minimize the number of secondary corridors and, where required, provide space for flush mounted perimeter lockers. Develop hallways leading to washrooms so that they are not audio or visually isolated during regular school-time use.
(d) Stairwells	(d) Eliminate or minimize stairwell blind spots that are not visible from main corridors.
(e) Washrooms	(e) Strategically locate a safe activity directly overlooking this entrance. Wherever possible, eliminate the need for entry doors. Where privacy is an issue, consider the development of a screen wall at a height to allow surveillance by staff.
(f) General Purpose Lockers	(f) In the absence of superior overlook opportunities from above, avoid the development of locker bays or alcoves that cannot be viewed from the main corridors.

Has the need for observation been carried consistently throughout the project?	
(g) Doorways/Doors	(g) Where doorways have been strategically located to enhance natural surveillance, specify doors or doorways that offer natural surveillance even while the door is closed, i.e. a window in the door or sidelight.
(h) Window Coverings	(h) Limit window coverings where privacy is not required. When privacy is desired such as a staff room, consider perforated roller blinds.

Section 5.3.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to less observable areas. Accomplish this by developing a movement predictor from the main entrance that passes the office area without offering a choice to visitors. Strategically develop an office reception space that provides a natural destination for visitors. Consider the use of a door enunciator.

Section 5.3.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Provide for the development of territorial influence around entry points. Clearly delineate the movement from semi-public to private space. Reinforce the movement with the strategic posting of easy to see and read signs such as REPORT TO THE MAIN OFFICE or in the case of student washrooms BOYS/GIRLS ONLY. Wherever possible, incorporate universally recognized symbols, such as STOP, into the signage.

Section 5.4 Portables

Emphasis: Develop an effective learning environment that will effectively deal with the movement of people onto and through the property.

Section 5.4.1 Surveillance

Issues	Design Directive
Does the placement allow us to observe?	Provide ample opportunity for legitimate users, engaged in their normal activities, to observe the space around them both day and night. Strategically orient portables to minimize disruption of existing sightlines; maximize observation of entry points (doors and windows) and loitering spots (steps) from surrounding neighbourhoods and, where appropriate, streets; and limit the development of unobserved alcoves where witness potential exists.
Is the natural surveillance level responsive to the needs for observation?	Wherever possible, orient the portables so that a teacher can continually follow the progress of a child travelling between the portable and the designated school entrance.
Has the need for observation been carried consistently throughout the project?	Provide uniform lighting around observable entry points. Consider turning off the lights where witness potential does not regularly exist so as not to aid in socialization, vandalism/graffiti and break and enters. Where lighting is desired in areas with poor or limited natural surveillance, consider wire screened motion-activated lights that leave a light trail beyond the perimeter of the portable area, signalling the presence of people. Where multiple portables have been laid out in a grid pattern, consider the deployment of wire screened motion-activated lights at all entry points to interior alleys.

Section 5.4.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to unobservable areas. Accomplish this by training (placing portables end-to-end with a covered fire separation) portables according to fire fighting specifications and limiting the development of internal grid style alleys. Where internal alleyways exist, limit vehicular access using curb stones, swing gates or bollards. Limit seating areas around deck areas by avoiding flat railings and replacing them with hip or picket style railings. Supplement natural forms of access control with effective target hardening techniques including strategically placed alarm boxes with siren and flashing strobe.

Section 5.4.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Strategically post NO LOITERING and NO UNAUTHORIZED VEHICLE signs around the perimeter of the portable or where more than one portable exists.

6. Automated Bank Machines

Statement of Purpose

This section is intended to promote the safe and consistent deployment of automated bank machines (ABMs) resulting in its safe and convenient use by ABM customers. This section is not intended to serve as a checklist or an exhaustive resource, as CPTED principles should be applied on a situational basis. ABMs are any electronic money dispensing device.

Introduction

The development of a safe and convenient ABM environment is dependent upon many factors including site, neighbourhood context, design, landscaping, physical security and the need to work with other site requirements. The application of CPTED principles will help banks achieve its objectives while minimizing crime and loss. A discussion on the maintenance of a safe environment is presented below.

Context

These principles are best applied to stand-alone buildings or kiosks.

Maintenance

Maintenance is critical to the ongoing perception of safety as it relates to the ABM environment. A lack of timely or proper maintenance can result in chronically defective card readers, litter, graffiti and even sanitary issues. Over time, these and other factors, if left unchecked.

- Influence the real and perceived safety of ABM customers
- Result in further problems
- Ultimately, result in decreased use

In order to promote safety and activity, it is important to regularly monitor and deal with maintenance problems and, where it is persistent, take proactive steps to prevent a recurrence.

Section 6.1 Drive-thru

Emphasis: Develop a safe and convenient drive-thru ABM environment for the ABM user.

Section 6.1.1 Natural Surveillance

Issues	Design Directive
Does the design allow us to observe?	Locate ABMs in bright, open, highly visible locations. This location should provide ample opportunities for passers-by to casually observe the surroundings from the closest public street **(See Appendix 4)**. Avoid creating an environment that directs the user away from natural surveillance by passers-by over an extended distance, such as the rear of a long linear building where natural surveillance from active areas is degraded **(See Appendix 5)**.
Is this level responsive to the needs for observation?	Avoid placing ABMs in locations that cannot be monitored by passers-by or are dependent upon a single or predictably limited source of natural surveillance depending upon the time of day.
Has the need for observation been carried consistently throughout the banking environment?	
(a) Approach	(a) Develop an approach that provides ample opportunity for the driver to assess the safety of the bank machine environment. Install a parabolic mirror where a corner limits the driver's sight lines.
(b) Egress	(b) Create an egress route, which is open and observable for both the driver and passers-by on the street.
(c) Lighting	(c) Ensure uniform lighting of all paved surfaces using a white light source. Minimize glare and light trespass by lighting from the perimeter of the property inwards.
(d) Closed Circuit Television (CCTV)	(d) Locate cameras and provide suitable lenses to view areas adjacent to ABMs and the approach lanes. Keep the angle of the rising and setting sun in mind when selecting camera locations. License plates of the vehicle at the ABM should be legible on the recorded image. Consider using a dome housing to disguise a fixed camera mount. Strategically post signs around the perimeter of your property advising visitors to your property that they will be videotaped to deter criminal activity.
(e) Landscaping	(e) Select and arrange landscaping so that important sight lines are not compromised. Consider high branching deciduous trees and low ground cover when choosing landscape material.

Section 6.1.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	
(a) Ingress Route	(a) Develop a straightforward approach with a clear separation between pedestrians and vehicles.
(b) Egress Route	(b) Develop an exit route that directly returns the driver to a public street or a common area that is familiar to the user.
(c) Escape Lane	(c) Reduce entrapment potential by developing an easy to access escape lane for every side of the building with a stacking lane. Avoid the use of physical structures that may be seen as barriers.

Section 6.1.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Develop the distinction between pedestrian and car by demarcating the drive thru area from the pedestrian area. Accomplish this by minimizing the potential for desire lines through the area and the strategic application of pavement markings and changes in pavement materials.

Section 6.2 Walk-up

Emphasis: Develop a safe and convenient walk-up ABM environment for the ABM user.

Section 6.2.1 Natural Surveillance

Issues	Design Directive
Does the design allow us to observe?	Prominently locate ABMs in active, highly visible areas that provide an opportunity to observe the entire vestibule from the exterior. Avoid creating an ABM vestibule with corners that cannot be seen around before entering the structure or knee walls, which are capable of hiding a prone person from passers-by on the street.
Is this level responsive to the needs for observation?	Strategically position the entrance door so that it is oriented towards the main source of natural surveillance and the parking area used by ABM users if one is provided.
Has the need for observation been carried consistently throughout the project?	
(a) Glazing	(a) Maximize the glazing and limit the amount of glass reflection by using clear glass and avoiding window tints.
(b) Window Treatments	(b) Avoid window treatments including films, blinds or window covers whenever possible. In cases of extreme sun exposure resulting in heat build-up or glare, consider window awnings. Where window awnings do not address the problem, consider the application of a window film to the upper portion as required. The strength of the tint should be limited to the minimum that is required.
(c) Marketing Materials and Signs	(c) Provide for the maintenance of the vestibule's visual integrity. Accomplish this by developing a formal location for the safe display of marketing material and the placement of signs that does not interfere with sight lines.
(d) Lighting	(d) Provide uniform lighting both inside and out including the parking area most likely to be used by the ABM night-time users. Install lights that provide a white light source.
(e) Landscaping	(e) Limit landscaping along the approach to high branching deciduous or low ground cover. Avoid the use of fencing that impedes critical sight lines from a public street.
(f) Mechanical Forms of Surveillance	(f) Provide CCTV coverage of the inside of the vestibule. Consider the use of motion-activated technology to support effective monitoring. Prominently post signs advising of the presence of video taping for the purpose of deterring criminal activity.

Section 6.2.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	
(a) Ingress/Egress Routes	(a) Create as direct a route as possible for persons approaching and leaving the ABM. Avoid the development of blind corners, which are not oriented towards the main source of natural surveillance.
(b) Parking	(b) Locate parking spaces so as to minimize distance and maximize natural surveillance to the ABM vestibule.
(c) Physical Security	(c) Provide a mechanical form of access control on the entry doors and consider a door enunciator. Ensure that the mechanism and door are kept in good working order and consider installing an escape paddle.
(d) Places Where People Can Sit	(d) Avoid the development of formal or informal seating areas, such as substantial window ledges or benches, so as not to encourage loitering that may result in customer intimidation or attack.
(e) Places Where People Can Loiter	(e) Avoid the placement of a telephone booth in the vicinity of an ABM.

Section 6.2.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Install tamper resistant trash receptacles in the vestibule. Maintain a clean, sterile environment that is business like and free from potential sources of litter, such as newspaper stands.

7. Multi-storey Residential Buildings

Statement of Purpose

This section is intended to provide a direction for the design and development of safe and comfortable multi-storey residential developments that are consistent with the best applications of CPTED principles. It is not intended to serve as a checklist or an exhaustive resource, as CPTED principles should be applied on a situational basis.

Introduction

The development of safe and secure housing is more than just achieving good site layout, building design, landscaping, physical security, etc. It also requires the development of an environment whereby residents are given ample opportunity to see each other, interact with each other and build a sense of community. This commonly occurs through the provision of formal and informal facilities that serve to bring the residents together. This can include recreational/meeting spaces, community gardens**,** mail boxes, bulletin boards, etc.

Development of the site should begin by completing the space assessment found in Section 3. This will assist in locating driveways, parking lots, drop-offs, buildings, amenity spaces, etc. in the spaces that can best support them.

Once this is accomplished, the design of the property may begin in earnest. Begin by developing a building design that meets primary objectives and is legible to a first time visitor. Support these objectives by designing the building's facade, grounds and amenity spaces to meet the intended use and minimize leftover space. Consider other ideas to improve wayfinding, particularly as it relates to large or similar looking spaces.

Legible Design

Legible designs assist first time visitors in finding their way about a property by organizing the space in such a way that entrances and other key features are located where people would naturally expect them, drawing from their experience with other similar properties. Designs that lack legibility can create confusion and should be avoided wherever possible.

Desire Lines

Desire lines represent natural shortcuts through a property by residents and outsiders. In order to minimize the potential for externally generated desire lines, be extremely cognizant of the context of the development with existing and proposed neighbours. Where the development is physically situated between an outside development and retail plaza or a school, for example, desire lines should be anticipated for the purpose of developing the property in such a way that the desire line is precluded. This will require the development of a strong transition between public, semi-public and private space featuring symbolic and physical barriers that may include fences and built form.

Siting of Building(s)

The siting of the building can play a critical role in the development of desire lines, leftover spaces and opportunities for adjacencies. It can also have a major impact on "eyes on the street" and the site itself.

Structures can be used to reinforce boundaries or transitions between public, semi-public and private space.

Leftover/Remnants of Space

Leftover or ambiguous spaces generally lack any clue as to what it is for and who it is for, and as a result, are commonly used by loiterers. Leftover spaces can be created by the void between a property line and the above-grade projection of an underground parking structure. All space should be assigned a purpose. Dead, unobservable spaces should be avoided.

Layout of Building(s)

Configure the corridors so that it facilitates natural surveillance from within the corridor and waiting areas such as the elevator lobby. Minimize alcoves and hiding spots, especially around suite entry doors.

Provide for a clear and direct corridor(s), especially from transitional areas of the building. Limit the need for changes in direction and multiple corridor doors.

Adjacencies

Take advantage of opportunities for direct relationships that maximize natural surveillance, access control and territoriality and improve the functioning of the property. Common examples of areas that benefit from direct relationships include the visitor parking lot, main entrance, laundry room, outdoor area, lobby and mail box spaces and recreation rooms with direct access to the exterior.

Storage

Consider providing in suite storage as opposed to a common storage facility. Where common storage is provided, develop the access point from within the interior of the building in proximity to an activity generator, such as an elevator lobby. Wherever possible, separate the storage area from other common areas, such as laundry rooms.

Wayfinding

Wayfinding includes a variety of techniques directed at orienting people as they move about a space. Wayfinding techniques are meant to complement legible design and should not be a substitute for it, and can include signage, colour symbols, site maps, etc. Site maps should be used where there is more than one municipal address.

Street Numbering

Street numbers should be prominently located in a highly visible area using contrasting surfaces, clear writing and night-time illumination.

Maintenance

Maintenance is critical to the ongoing perception of safety as it relates to the environment. In order to promote safety and activity, it is important to regularly monitor and deal with maintenance problems, and where it is persistent, take proactive steps to prevent a recurrence.

Section 7.1 Grounds

Emphasis: Design a legible, attractive development that will effectively guide and influence the movement of people through areas of high natural surveillance and defensible space.

Section 7.1.1 Natural Surveillance

Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunities for residents and visitors to casually observe all areas of the grounds from within the site.
Is the natural surveillance level responsive to the needs for observation?	Strategically locate driveways, driveway entrances, sidewalks, surface parking lots, parking garage ramps and entrances, parking garage stairwells/outbuildings and outdoor amenity spaces including tot lots, children's playgrounds, tennis and basketball courts, pools and gazebos in areas of high natural surveillance.
Has the need for observation been carried consistently throughout the property?	
(a) Landscaping	(a) Select and arrange landscaping so that important sightlines are not compromised now or in the future as a result of growth. Consider high branching deciduous trees and low shrubs or ground cover when choosing landscape material. Where coniferous trees are used, be cognizant of the potential screen effect and allow for view corridors (gaps between plantings) to maintain critical lines of sight. Be cognizant of the rate of growth and its impact on a maintenance schedule. Co-ordinate planting with the lighting plan. Allow sufficient spacing around light fixtures to provide for the unfettered distribution of light. Promote natural surveillance opportunities with the strategic deployment of outdoor furniture.
(b) Lighting	(b) Ensure uniform lighting of vehicle and pedestrian areas using a white light source. Minimize glare and light trespass by lighting from the perimeter of the property inwards. Provide for the strategic, after hours lighting of play areas, including pools, playground equipment, gazebos, etc. so that residents can monitor the use of these facilities outside of normal operating hours by trespassers, loiterers and other abnormal users. Consider motion-activated lighting for these facilities where feasible. Be careful to avoid lighting facilities such as basketball courts. This may promote and extend the use of these facilities beyond normal operating hours.
(c) CCTV	(c) Strategically locate CCTVs in areas of high visibility, such as the ramp leading to the entrance of an

	underground parking garage to maximize deterrence. Consider motion-activated technology, a dome housing to disguise a fixed camera mount, providing residents**/**staff with the ability to monitor the CCTV feed through the building's cable television network. Post signs at strategic entry points to your property and building advising visitors to your property that they will be videotaped. Never use a dummy camera, as this can give people a false sense of security and can become a liability issue.
d) Signage	(d) Locate large scale signage/site maps so that important sightlines are not compromised.

Section 7.1.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to unobservable areas.
(a) Outdoor Amenity Space	(a) Fence and gate outdoor amenity areas where appropriate. Reinforce the perimeter at strategic points where a desire line may develop using "hostile" landscape material, such as rose bushes or species with thorns. Consider limiting the trespass potential of basketball facilities by providing for removable basketball nets/collapsible standards.
(b) Skateboard Friendly Surfaces	(b) Limit unauthorized skateboarding by paying careful attention to the development of extensive curbs, concrete planters and other bench-like surfaces, particularly where they are juxtaposed next to smooth, flat surfaces that have a gentle grade. Consider creating regular breaks in the continuity of the edge by developing a notched surface and/or recesses.
(c) Parking Structure Ramp	(c) Consider strategically locating the ramp to a below grade parking structure to reinforce boundaries and serve as a transition between public and private space. **See Photo 17**.
(d) Parking Structure Stairwells	(d) Refer to Section 4.2.2 – At-Grade Enclosure.

Photo 17: This ramp creates a natural barrier between the building's amenity space and the rear alley of a shopping plaza.

Section 7.1.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Develop a transition that indicates the movement from public to semi-public then private spaces. Accomplish this with signage and the use of symbolic and/or physical barriers at property lines and transitional zones. Transitional zones may be defined by fences, changes to walkway or driveway materials and structures including buildings. Identify the owner of the property and include a brief trespassing message such as NO TRESPASSING or TRESPASSERS WILL BE PROSECUTED.
(a) Outdoor Amenity Spaces	(a) Locate outdoor amenity spaces away from publicly accessible space, ensuring an adequate transition so that normal users of the space develop territorial feelings.
(b) Surface Parking Lots	(b) Physically separate visitor and tenant parking. Create a direct and convenient relationship between the visitor parking area and main entrances. Reinforce the intended use by posting signs.

Section 7.2 Building Exterior

Emphasis: Design an exterior that effectively deals with the movement of people into and around the building.

Section 7.2.1 Surveillance

Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunities for legitimate users, engaged in their normal activities, to observe the publicly accessible space around them from both inside and outside the building. Facilitate observation by varying the built form while minimizing alcoves and hiding spots, especially next to accessible windows and doors.
Is this natural surveillance level responsive to the needs for observation?	Attempt to match the need for natural surveillance with the available witness potential. Be cognizant of the main sources of natural surveillance. Emphasize natural surveillance of vulnerable areas.
Has the need for observation been carried consistently throughout the project?	
(a) Glazing	(a) Maximize opportunities for natural surveillance around the property and at strategic locations such as lobbies and recreational areas. Avoid large expanses of blank walls on any one side of the building.
b) Lighting	(b) Install lights that provide a white light source.
c) Landscaping	(c) Strategically locate landscaping along an approach using landscape materials such as high branching deciduous and/or low shrubs/ground cover. Avoid the use of solid fencing that impedes critical sightlines from a public street.
(d) Mechanical Forms of Surveillance	(d) Provide CCTV coverage of the inside of the vestibule. Prominently post signs advising of the presence of video taping for the purpose of deterring criminal activity.

Section 7.2.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	Direct normal access to observable areas and prevent access to unobservable areas.
a) Building Entrances	(a) Develop an exterior that naturally draws visitors to the main entrance while deemphasizing secondary access points. Avoid providing sitable surfaces that can provide impromptu seating next to the main entrance.
b) Parking Garage Entrance	(b) Refer to Section 4.1.2(g) – Access Control.
c) Physical Security	(c) Provide a mechanical form of access control on the entry doors and consider a door enunciator. Ensure that the mechanism and door are kept in good working order.

Section 7.2.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Create a building design that promotes pride of ownership by residents.

Section 7.3 Building Interior

Emphasis: Develop a safe and pleasant communal living space.	
Section 7.3.1 Surveillance	
Issues	Design Directive
Does the design allow us to observe?	Provide ample opportunity for legitimate users, engaged in their normal activities, to observe the space around them. Accomplish this by strategically matching areas that require natural surveillance with areas that naturally provide it.
Is the natural surveillance level responsive to the needs for observation?	
(a) Entry Vestibule	(a) Maximize glazing in and around the entry vestibule. **See Photo 18**
(b) Lobby	(b) Create a dynamic lobby that maximizes opportunities for natural surveillance from a variety of sources such as a management office, mail room, elevator waiting area, corridors. Maximize these opportunities by minimizing visual obstructions between these points.
(c) Mail Room/Pick-up Area	(c) Consider developing an exterior service access to the mail room. Configure the area to avoid large hidden spaces and/or corners.

(d) Main Floor Elevator Waiting Area	(d) Prominently locate the elevator waiting area so that it is visible to and overlooks the lobby.
(e) Management Office	(e) Where a management office is located adjacent to the lobby, provide for natural surveillance by introducing a window that allows staff, to see and be seen by visitors.
(f) Main Floor Corridors	(f) Strategically locate the corridor entry points so that they offer some natural surveillance to the lobbies. Where the corridor is separated by a doorway (see Stairwell/Corridor Doors) introduce glazing to maximize natural surveillance opportunities. **See Photo 19.**
(g) Laundry Room/Equipment	(g) Locate laundry rooms adjacent to active areas such as main floor corridors. Develop a strategic relationship between the laundry room and exterior play areas. Maximize surveillance opportunities by introducing glazing. Design the interior to minimize obstructions and hidden corners from within. **See Photo 20.**
(h) Cash Reload Machines	(h) Locate cash reload machines in active corridors opposite a potential source of natural surveillance such as a management office or mail box area.
(i) Fitness Area	(i) Locate fitness rooms in active areas. Maximize natural surveillance by introducing windows.
(j) Parking	(j) Refer to Sections 4.1.1 and 4.2.1.
Has the need for observation been carried consistently throughout the project?	
(k) Suite Doors	(k) Install a door scope or a good quality peephole viewer that affords a wide angle view. Install a second peephole where required for persons with disabilities.
(l) Stairwell/Corridor Doors	(l) Install a fire rated vision panel in all stairwell doors.
(m) CCTV	(m) Invest in good quality closed circuit television equipment and provide coverage of the front lobby, entry/exit points and other vulnerable areas such as storage and laundry rooms and unavoidable hidden areas. Provide residents with the ability to monitor these systems with their cable TV. Prominently house the cameras in visible areas utilizing a speed dome. Record the feed and conduct regular maintenance on the equipment and/or tapes. Prominently post signs advising of the presence of video taping for the purpose of deterring criminal activity.
(n) Common Area Window Coverings	(n) Limit window coverings where privacy is not required. When privacy is desired, consider a type of blind that can provide a partial privacy option.

(o) Mirrors	(o) Consider the strategic use of large, conventional mirrors in lobbies, elevators and any other location that facilitates natural surveillance within a vulnerable area. Limit the use of parabolic (security) mirrors to areas where natural surveillance is limited and conventional mirrors are not a suitable option.

Photo 18: This entry vestibule is glazed on three sides maximizing natural surveillance and limiting hiding opportunities.

Photo 19: Windows in and around the hallway door provide for natural surveillance and make users feel more comfortable.

Photo 20: This laundry room has been strategically located to maximize natural surveillance of the nearby tot lot.

Section 7.3.2 Access Control	
Issues	Design Directive
Does the design decrease criminal opportunity by effectively guiding and influencing movement?	
(a) Ingress/Egress Routes	(a) Provide a mechanical form of access control on the entry doors. Ensure that the mechanism, door and door closer are kept in good working order.
(b) Parking	(b) Refer to Sections 4.1.2 and 4.2.2.
(c) Roof Access	(c) Consider precluding the development of an infrequently used and poorly observed landing and stairwell to the roof by constructing a permanent ladder with a hinged metal sheet that can be secured by a padlock. **See Photo 21**.
(d) Corridor Ceilings	(d) Avoid using suspended ceilings to limit hiding spots within the corridor.
(e) Recreation Room	(e) Provide direct access to the rec room from the exterior. Discreetly design and locate the entrance so that it is not confused with the main entrance of the building.
(f) Fire Alarm Pull Station	(f) Protect the fire alarm pull station with an approved plastic cover.

Section 7.3.3 Territorial Reinforcement	
Issues	Design Directive
Does the design act as a catalyst for natural surveillance and access control opportunities?	Develop inviting, comfortable and respectful common spaces such as lobbies and hallways that promote use and/or pride of ownership. Wherever possible avoid the development of seldom used or leftover spaces that lack an assigned purpose.

Photo 21: This fixed ladder eliminates the need for a seldom used and often problematic stairwell and landing.

Glossary

Abnormal User: Person whom you do not desire to be in a certain space.

Crime: An act or commission of an act that is forbidden or the omission of a duty that is commanded by a public law and that makes the offender liable to punishment by that law. Crime can be divided into four main categories:

- Reported
- Unreported
- Unacknowledged (store shrinkage)
- Undetected

The majority of crime is represented by the last three categories. For CPTED purposes, crime is simply the by-product of a human function that is not working properly.

Crime Prevention:
The anticipation, recognition and appraisal of a crime risk and the initiation of some action to remove or reduce it. For crime prevention to work, it must effectively remove or reduce one (or more) of the three essential components found in the "crime triangle."

Crime Triangle: The crime triangle is a graphic representation of the link between "crime" and its three essential components. The three components essential for a crime to occur are:

- Criminal desire
- Opportunity
- Victim

By removing or effectively reducing any one of these components, you can effectively prevent crime.

Defensible Space:
A term used to describe a residential environment whose physical characteristics – building layout and site plan – function to allow inhabitants themselves to become key agents in ensuring their own security.

Design: A term which, within the CPTED context, encompasses people and their physical and social surroundings.

Environmental Design: A term which, within the CPTED context, is rooted in the design of the man/environment relation.

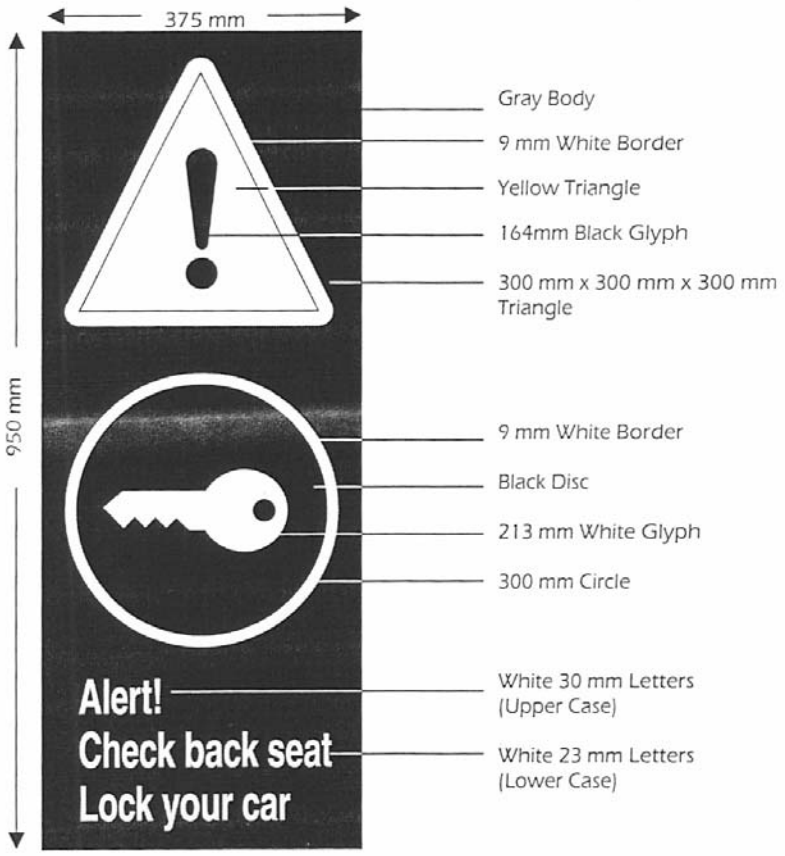
Natural: A term which refers to deriving access control and surveillance as a by-product of the normal and routine use of the environment.

Normal User: Person you desire to be in a certain space.

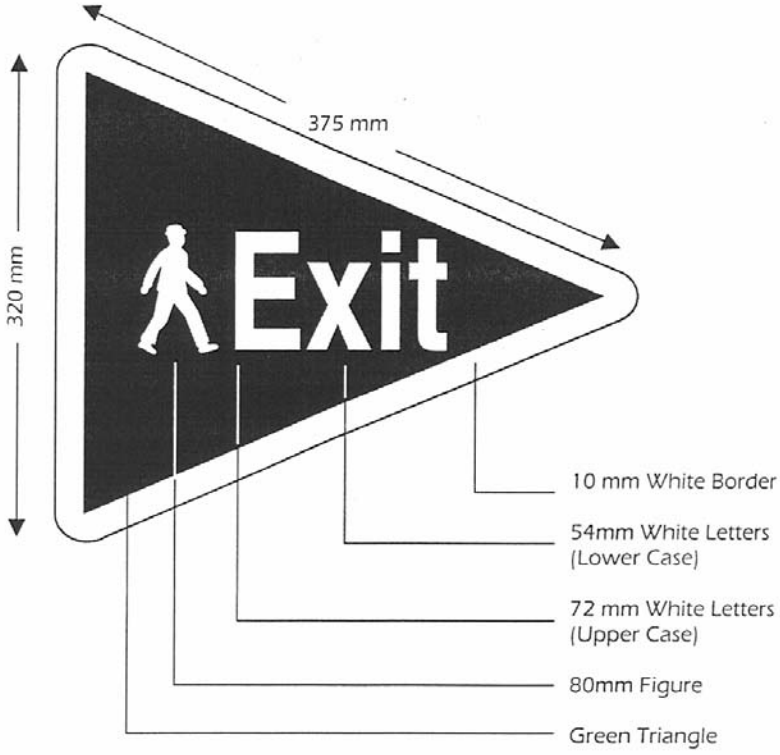
Safe Activity: A target neutral activity that results in increased natural surveillance.

Spatial Definition: A natural form of access control that relies on space to control access to property.

Appendix 1 - Alert Signs



Appendix 2 – Exit Signage I



Appendix 3 – Exit Signage II

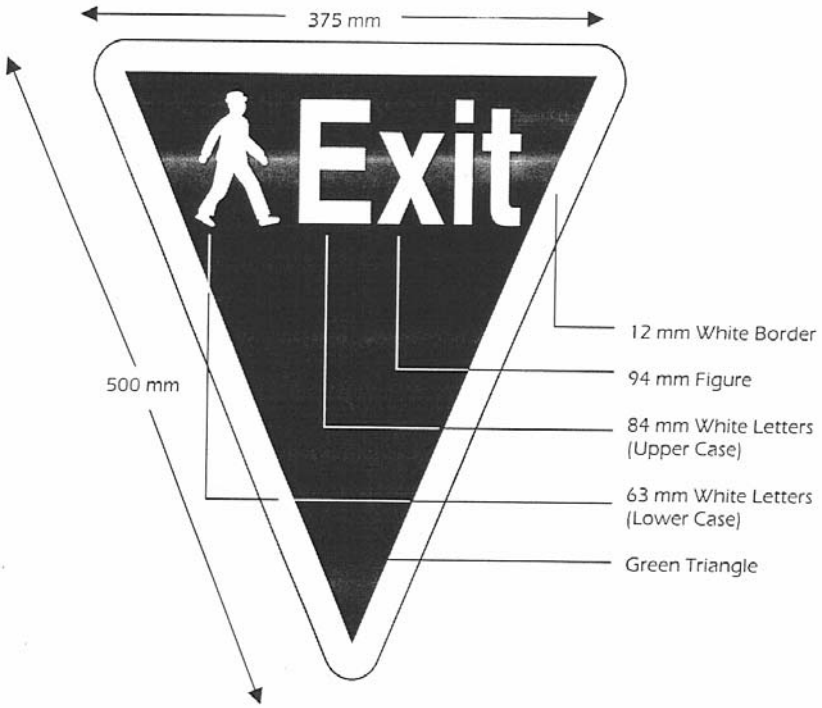
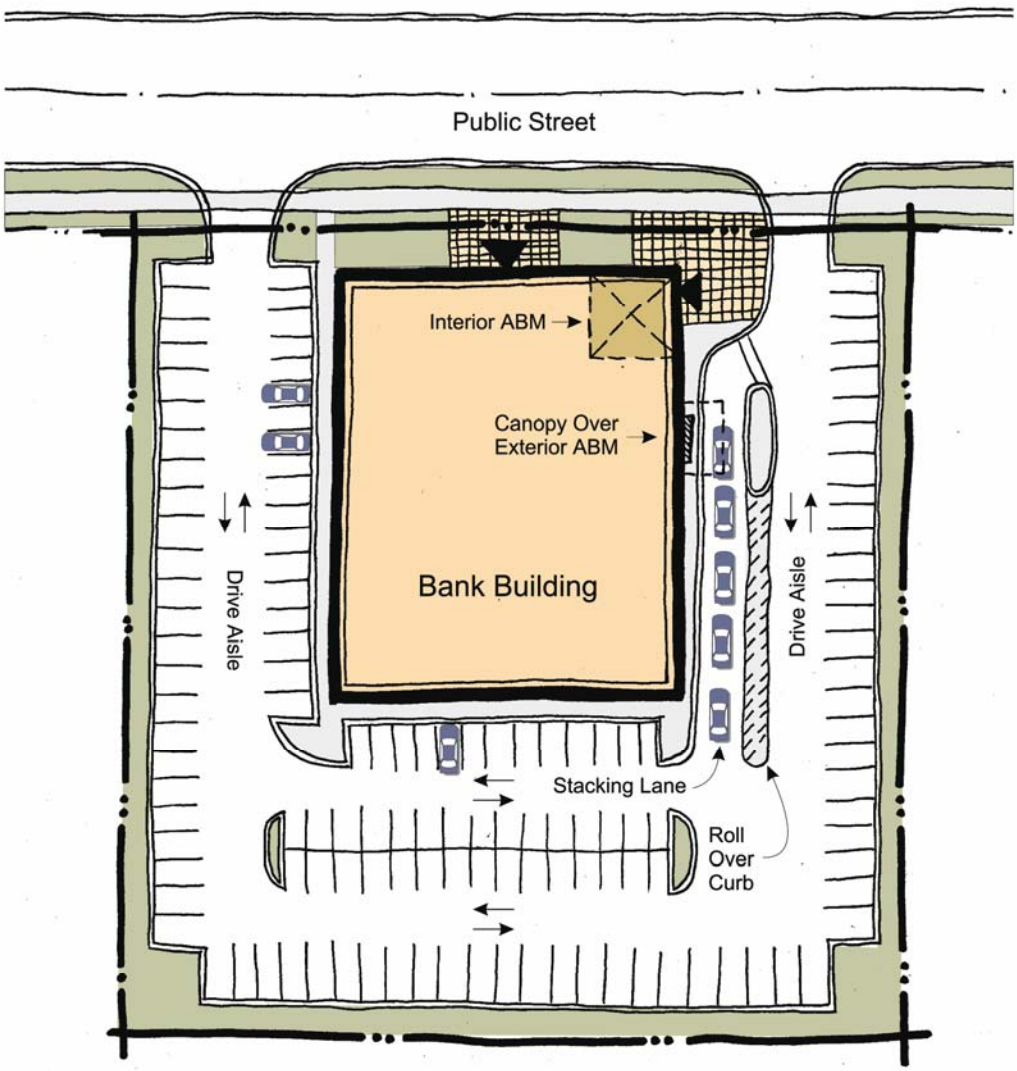


Exhibit 1-1



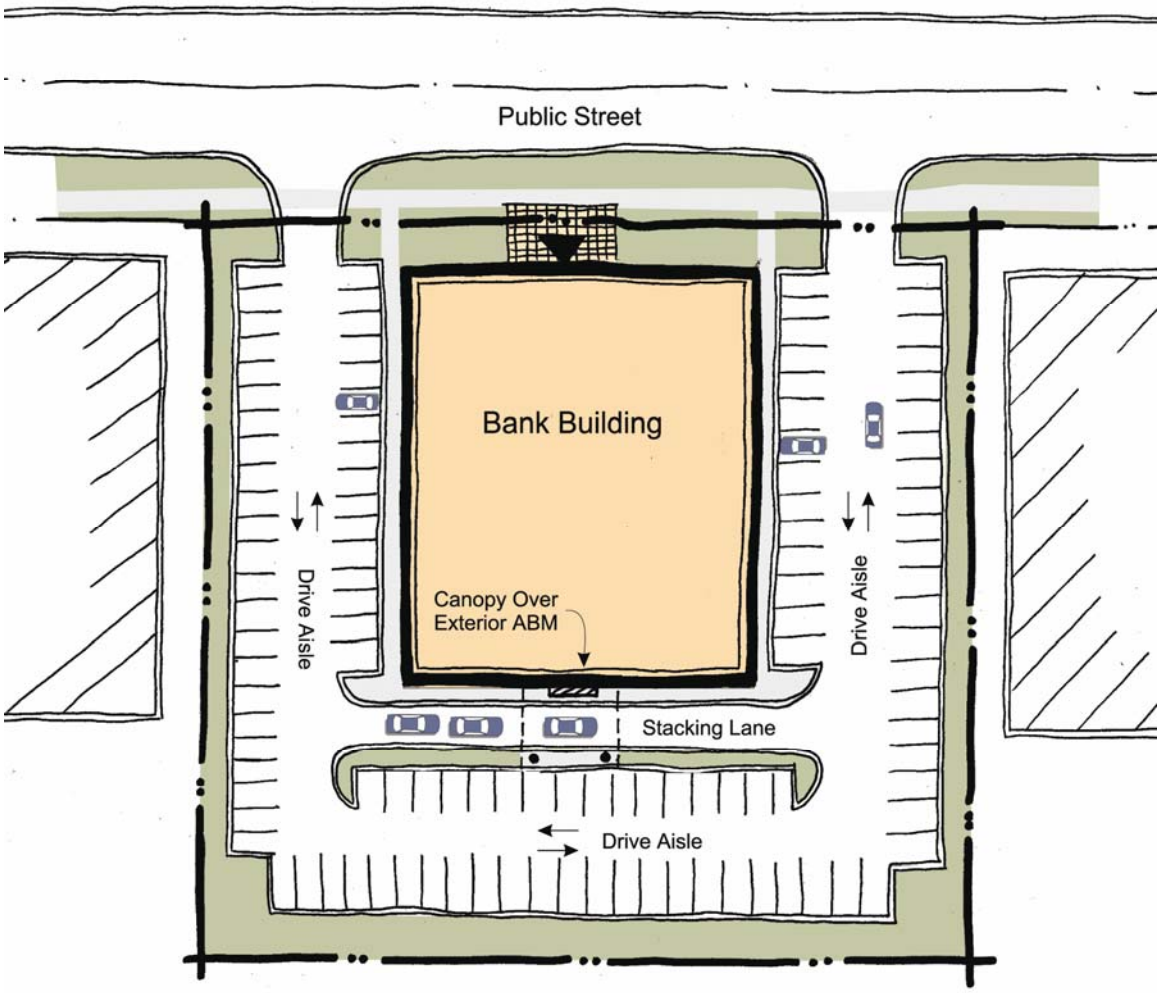
*Note: Drive-thru automated banking machine (ABM), is located to the side of the building to allow for natural surveillance from the public street

MISSISSAUGA
Planning and Building

Bank Drive-Thru ABM
Preferred Location

September 2001

Exhibit 1-2



*Note: Drive-thru automated banking machine (ABM), is located behind the building. This situation should be avoided, as the area is not able to be observed from the public street.

MISSISSAUGA
Planning and Building

Bank Drive-Thru ABM
Location to be Avoided

September 2001

Councillor Pat Saito	City of Mississauga
Cst. Tom McKay	Peel Regional Police
Wayne Nishihama	City of Mississauga
Dan Kraszewski	City of Brampton
Ian Cunningham	Mississauga Crime Prevention Association (MCPA)
Regional Chair Emil Kolb	Region of Peel
Councillor Susan DiMarco	City of Brampton
Councillor Nancy Stewart	Town of Caledon
Councillor Paul Palleschi	City of Brampton
Dave Dumas	Peel District School Board
Robert Paterson	Ontario Provincial Police
Brian Keel	Town of Caledon
Larry Zacher	Brampton Safe City Association

Past Members

Mayor Marolyn Morrison	Town of Caledon
Mayor Carol Seglins	Town of Caledon
Councillor Gael Miles	City of Brampton
Virginia Debris	Region of Peel
Frances Fernandez	Region of Peel
Paul Mountford	Region of Peel
Bill Poole	Peel District School Board
Dorothy Thompson	Peel District School Board
Paul Damaso	Brampton Safe City Association

Parking Structures Sub-Committee

William Lee, Chair	City of Brampton
Cst. Tom McKay	Peel Regional Police
David Glover	City of Brampton
Dave King	City of Mississauga
Al Rezoski	City of Brampton
Derrick Thomson	City of Brampton
Shayne Turner	City of Mississauga

Schools Sub-Committee

Cst. Tom McKay, Chair	Peel Regional Police
Warren Harris	City of Mississauga
Daniel Kraszewski	City of Brampton
Ken MacSporran	Moffet & Duncan Architects Inc.
Maureen O'Shaughnessy	Carruthers Shaw and Partners Ltd, Architects
Dana Saccoccio	Saccoccio Weppler Architects Inc.

Automated Bank Machine Sub-Committee

Cst. Tom McKay, Chair	Peel Regional Police
Ed Nicolucci	City of Mississauga
Glen Vey	Scotiabank
Martin Alborough	Scotiabank

Multi-storey Residential Sub-Committee

Cst. Tom McKay, Chair	Peel Regional Police
Bruce McLean	Region of Peel
Par Rengasami	Peel Living
John Gwozdowski	Peel Living
Bernie Steiger	City of Brampton
Ed Nicolucci	City of Mississauga

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