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A Master’s Report submitted to the School of Urban and Regional Planning in partial fulfillment of the requirements for the degree of Master of Urban and Regional Planning

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Kingston, Ontario
June 2017

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EXECUTIVE SUMMARY


In a post 9/11 world, fear of crime and terrorism in the West has become increasingly high, especially in important areas or pedestrian-heavy environments. As a result, planning of public spaces has started to shift towards more preventative measures of urban design to protect the public realm in some of the most vulnerable areas to these attacks. On the other hand, important buildings have also started to implement similar hardening and security features through environmental design. In response to these implementations, buildings of importance have been using a physical-structure based approach at planning urban spaces through Crime Prevention through Environmental Design (CPTED) and Anti-Terrorism (AT) planning.

This research project examined the links between Crime Prevention through Environmental Design (CPTED), Antiterrorism planning (AT) and its integration into the urban environment of two embassies on the ceremonial Confederation Boulevard in the downtown core of Ottawa, ON. The two embassies include the British High Commission and the US Embassy, both located near Parliament Hill. The objective of the study was to examine each embassy’s use of security and CPTED, identify the embassy that better integrates security and CPTED with the surrounding urban environment and create a set of recommendations based on these findings. The research used evaluation criteria established through CPTED principles and Anti-Terrorism literature and government reports.
A site audit of the integrated security features of both sites was conducted in the Fall of 2016 and the Spring of 2017. The findings from the audit revealed some of the security features and integration issues on both sites. Some negative findings included:

- An abundance of security cameras
- Poor use of fences
- Obvious anti-terrorism features that attract attention
- Inconsistent use of security features
- Too much strengthening of the building (also known as target hardening)
- Not enough delineation of space

However, it is of some importance to note that there were some positive elements of the integration into the urban environment such as:

- The British High commission’s security retrofit
- The use of natural features for target hardening at the pedestrian scale
- The use of security features to deter the opportunity for crime.
Here’s how the embassies performed in the study of anti-terrorism principles and CPTED:

**EVALUATION SCHEME**

<table>
<thead>
<tr>
<th>Does not fulfill</th>
<th>Minimal fulfillment</th>
<th>Somewhat fulfills</th>
<th>Almost fulfills</th>
<th>Fulfills criterion</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Table A: Evaluation of Embassies</th>
<th>US EMBASSY</th>
<th>BRITISH HIGH COMMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anti-Terrorism</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deter: Deter terrorists from attacking the building through its design</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Detect: Detect and monitor potential threats</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Deny: Minimize or delay loss of life or building damage</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Devalue: Make the building appear to be of little or no value or consequence</td>
<td>[ ], [ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td><strong>CPTED</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Hardening: A hierarchy of power through the visible defense of the building</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Access Control: Deter crime through the delineation of boundaries and establishment of space</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Environmental Support: A design that takes into account the surrounding environment</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Real/Symbolic Boundaries: Identifying ownership of the space</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
<tr>
<td>Surveillance: Maximizing ability to spot suspicious people or activities</td>
<td>[ ], [ ]</td>
<td>[ ], [ ]</td>
</tr>
</tbody>
</table>

The previous table represents a summary of the evaluation of the criteria illustrated in chapter 4. The explanation of the criteria above is a summary and will be fully detailed in chapter 3, as well as in chapter 4 of this report.
Table B: Criteria-Specific Recommendations

<table>
<thead>
<tr>
<th>Criteria</th>
<th>US Embassy</th>
<th>British High Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deter</td>
<td>No recommendation</td>
<td>Reinforce the sides of the building to establish a clearer boundary.</td>
</tr>
<tr>
<td>Detect</td>
<td>Revisit the use of highly visible security features.</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Deny</td>
<td>No recommendation</td>
<td>Establish a larger security network along the building</td>
</tr>
<tr>
<td>Devalue</td>
<td>- Create a more uniform and unobtrusive building.</td>
<td>No recommendation</td>
</tr>
<tr>
<td></td>
<td>- Revisit the use of visible security features.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Extend the bicycle lanes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Work at creating a building environment that blends in with the surrounding urban fabric.</td>
<td></td>
</tr>
<tr>
<td>Target Hardening</td>
<td>No recommendation</td>
<td>Implement more natural target hardening features along the perimeter of the building</td>
</tr>
<tr>
<td>Access Control</td>
<td>No recommendation</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Real/Symbolic Boundaries</td>
<td>Work to create a more symbolic boundary – utilize the natural as well as built elements to their advantage</td>
<td>Work to create a more real boundary – utilize the natural as well as built elements</td>
</tr>
<tr>
<td>Environmental Support</td>
<td>Adapt the building’s façade and entrances to further support the public realm</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Surveillance</td>
<td>Recommendation to revisit future use of visible surveillance measures</td>
<td>No recommendation</td>
</tr>
</tbody>
</table>
The recommendations for each foreign embassy include:

- **British High Commission:**
  - Reinforcing the sides of the building in a similar fashion to the façade;
  - Take advantage of the urban environment for surveillance; and
  - Establish a better boundary

- **US Embassy:**
  - Extend the separated bicycle lanes past the embassy;
  - Create a secure and unobtrusive façade; and
  - Revisit the use of physical security features.

This research project promotes the use of security features in a way that better integrates with the current community design and security practices in Canada’s Capital Region. Furthermore, it outlines strengths and weaknesses of the current systems used. It highlighted the role of security planners to take into account the effect the security features have on the surrounding environment to make decisions that would reduce the fear of crime, but also reduce crime opportunity. Through good planning and urban design, these spaces could be managed effectively and more seamlessly integrate themselves into the surrounding land uses to have a low-profile building with an abundance of physical security.
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GLOSSARY

**Access Control:** Deter crime through the delineation of boundaries and establishment of space.

**Antiterrorism Design:** Physical characteristics that aim to protect a building or space against targeted attacks.

**Bollards:** A short, thick post used traditionally to divert traffic, it is also used to protect the outside of buildings.

**Closed Circuit Television (CCTV):** More commonly known as video surveillance, involves the use of cameras to monitor a space.

**Crime Prevention Through Environmental Design (CPTED):** A way to manipulate the physical environment to deter the opportunity for crime.

**Deny:** Minimize or delay loss of life or building damage.

**Detect:** Detect and monitor potential threats.

**Deter:** Deter terrorists from attacking the building through its design.

**Devalue:** Make the building appear to be of little or no value or consequence.

**Environmental Support:** A design that takes into account the surrounding environment.

**Federal Emergency Management Agency (FEMA):** United States government agency which aims to prepare for, prevent, respond to, and recover from domestic disasters.

**Hierarchy of power:** A real or symbolic identification of importance through design features and scale.

**Real/Symbolic Boundaries:** Identifying ownership of the space.

**Surveillance:** Maximizing ability to spot suspicious people or activities.

**Target Hardening:** The visible defense of the building through the addition of physical features.

**Terrorism:** the use of violence for political aims causing mass casualties and fear and unrest with the general public.
ACKNOWLEDGEMENTS

I would like to extend my sincerest gratitude to my supervisor Dr. David Gordon for his unwavering guidance and support throughout this entire process. It is with his encouragement, knowledge, feedback and passion for his students and urban planning that he was able to guide and inspire me during the completion of this work.

I would also like to thank Dr. Gordon’s other report students; Ian Pinchin and Julia Sjaarda for being an incredible support group during the writing process – without your comments and support early in the process, this task would have seemed impossible. You both made the report writing process fun and manageable.

And finally, I am grateful for my family and friends for their continuous support throughout my two years at SURP. Thank you to my parents for being supportive and pushing me to pursue of my interests and to Benjamin for constantly being by my side over the past years. Finally, a special thank you goes out to my colleagues, professors and support staff at SURP for an incredible past two years.
1  **INTRODUCTION**

1.1  **Background**

The fear of crime and terrorism in the western world has become increasingly high in the post 9/11 era. Terrorism can be defined as the use of violence for political aims causing mass casualties and fear and unrest with the general public (Canadian Department of Justice, 2015). While terrorism is noted as being a political phenomenon, it has intrinsically affected the way that political capitals are planned. This issue is interesting from a research standpoint because it has caused a shift to more preventative and secure methods of planning structures and areas (Rothock, 2010). These changes can be distinguished physically by high fences, increased surveillance and the addition of bollards in an effort to reduce crime and offer fewer opportunities for crime and terrorism through the surrounding urban fabric (Rothock, 2010). This work will address these changes through case studies and analysis.

These changes can be linked back to the use of Crime Prevention through Environmental Design (CPTED) principles, and Anti-Terrorism (AT) planning principles: CPTED was developed around 1971 by C. Ray Jeffery as a multi-disciplinary approach to crime prevention through environmental design (Rothock, 2010). The techniques were fundamentally derived from the works of Elizabeth Wood’s security guidelines for the Chicago Housing Authority in the 1906’s and Jane Jacobs’ *Death and Life of Great American Cities* (1961). CPTED is a consolidation of theories stemming from sociology, urban design and security studies that suggest that the natural and built environment can deter the opportunity of crime by influencing the criminal’s decision-making process (ICA, 2016). CPTED is used generally in urban environments by planners, architects and
designers to alter the physical setting of areas to reduce the opportunity for criminal activity through the addition of fences, lighting and the elimination of blank walls or ‘hiding spaces’ (ICA, 2016). Within urban environments, CPTED is often applied in private and social housing complexes, as well as urban areas with a higher opportunity, interest or rate of crime. CPTED is now used widely by security agencies, police forces and planners in building these types of urban concepts or high-risk buildings.

Antiterrorism planning stems from the need to defend spaces for Americans abroad since a rise of embassy bombings in the 1980’s, it has been reflected more substantially in documents prepared by the US Federal Emergency Management Agency as recently as 2007 (FEMA, 2007). Antiterrorism design is mainly focused on the physical measures taken to defend buildings against terror attacks through design elements like perimeter security. Antiterrorism design is fundamentally based in threat risk assessments, where officials survey buildings of importance to ultimately understand its vulnerabilities. This theory has been used by military planners for the design military bases and structures abroad, but it was the Oklahoma City Bombings and 9/11 that pushed city planning professionals and architects to adopt antiterrorism design on ‘home soil’ (Rothock, 2010).

When used effectively, security planning and design can reduce the incidents and opportunity for terrorism, while complimenting the surrounding urban environment, fostering an inherent sense of security. The security frameworks above are valid methods to use because of their success and continuous prevalence in exterior building security trends. The frameworks are widely understood and utilized by security architects, military planners and urban planners in the mitigation of crime and terror in an urban context, thus reinforcing their validity as a measurable planning system. It is critical for planners to
understand what CPTED and AT principles are appropriate for various urban settings and to consider the public use of the urban environment as a criterion for good urban design. By understanding the surrounding environment, it is possible to integrate good security measures seamlessly into the everyday streetscapes. This will be demonstrated through the analysis of the chosen cases.

1.2 Research Objective

The post 9/11 increase in anti-terrorism and security planning is currently used to reduce environmental risks and fears. Security planning aims to help mitigate potential threats to important buildings in urban areas. Planning principles vary from physical hardening features to human or electronic surveillance features.

The objective of the research is to study and address security planning in capital cities, identifying the best practices of incorporating security and CPTED measures in an urban environment through a case comparison. The report will study two embassies in Ottawa, both located on Confederation Boulevard, a major political, vehicular, and pedestrian transit route. CPTED is relevant to discuss hand-in-hand with security because it’s an extension of anti-crime techniques that are successful in crime prevention, ultimately affecting security planning techniques. The application of CPTED is useful in terms of the public security of embassies as it is easily translatable to the public realm in terms of crime deterrence. The application of both security and CPTED to the embassies is also based on their physical circumstances. They are both located in an urban setting, constantly surrounded by people – rather than in a secure remote location, thus reinforcing the decision to incorporate the two theories. Based on the anti-terrorism lessons learned from CPTED, the main question to guide the research is:

*Which embassy best incorporates both security and CPTED?*
Essentially, the objective is to further consolidate security and CPTED to analyse the use of successful crime-prevention techniques in an urban environment through the comparison of two similar at-risk and high-profile buildings located in this setting.

1.3 Scope of the Research

This study will only examine the application of security and CPTED planning features of the two selected cases. The cases chosen are the US Embassy and the British High Commission in Ottawa. By focusing the study on these cases, the researcher will therefore be able to provide a more concise analysis of the application of CPTED and security implications of the sites. To assess this, I will use selected CPTED principles and some anti-terrorism guidelines outlined in relation to CPTED by planning documents. The selection of specific principles is intended to narrow the scope of the research to only the truly relevant principles.

1.4 Research Precedents

As a precedent model, my research focused on a masters thesis from MIT “Anti-terrorism design and public safety: reconciling CPTED with the post-9/11 city” (Rothcock 2010), outlining the use of CPTED in security design in Boston and New York City. But it should be noted that security and capital planning design are regulated throughout various city plans and secondary plans. Since there is no established method for evaluating their security success on a site-specific basis, this report’s method focuses on the link between security and CPTED for evaluation. This work draws from a literature review of SURP reports and other academic articles pertaining to the CPTED theory and principles, along with security planning in a post 9/11 environment. Yi Qin’s Report “Designing for A Safer Public Housing Community: A Case Study of Chester Le, Toronto” (2014) helped inform the method, despite dealing with a different public safety subject
matter: she performed a literature review, then performed an audit of the area for the purposed of analysis. The other academic articles used for this conducted a similar audit and study of their cases. This report also draws from plans and guidelines like the US Federal Emergency Management Agency (FEMA) 426 (2003) and FEMA 430 (2007) for policy support and reference to effective security planning practices the first document reconciles the importance of CPTED in security planning.

1.5 Report Outline
This report is organized into four chapters. Chapter 1, the introduction, presents the topic, research objectives, scope and precedents. Chapter 2, context and background, provides context and framework for the research by offering a description of each case study, Confederation Boulevard, the City of Ottawa and an outline of policy documents and security planning practices. Chapter 3, methods, demonstrates the techniques used to collect and analyze to answer the research question such as the site audit method and the limitations of the research. Chapter 4, analysis, presents the findings of the audit, along with the analysis of each criterion. Lastly, Chapter 5, recommendations and conclusions, outlines the results of the findings and presents recommendations for improving security planning for each embassy. This chapter is based on the findings in the analysis and also contains the answer to the research question, discusses the limits to the research method as well as opportunities for further research. The final portion of the work contains the appendices pertaining to the data and site audit questions.
2 CASE STUDIES

2.1 Introduction
This chapter provides some background information on the topics of Crime Prevention Through Environmental Design (CPTED) and anti-terrorism planning and the site context. The purpose of the section is to provide a theoretical framework and justification of the research founded from a literature review for the research, analysis, and recommendations. The research included sources that focused on the links between policy, crime and terrorism planning as well as safety and urban design. This chapter is divided into four sections: CPTED and anti-terrorism planning, the US Embassy as a case study and the British High Commission as a case study.

2.2 CPTED and Anti-Terrorism Planning
Target hardening such as building strengthening and increased surveillance are widely known as a good method of crime prevention and reinforcement, such as locks, alarms, guards, CCTV’s, etc. However, these sometimes harsh features are not necessarily suited for all urban environments. The use of other crime prevention tools integrated into the built environment can offer equal opportunities for safety. Planners, architects and urban designers recognize the relationship between crime and the built environment. Jane Jacobs elaborated on this relationship through her ‘eyes on the street’ concept and now serves as a basis for ‘good’ planning and offers solutions to crime prevention in the planning of public and private spaces and delineates the role of the residents as policing agents (Mawby, 1977). C. Ray Jeffery’s CPTED model is a response to crime and urban environment and has become a staple in the planning profession, more specifically in public housing planning. The model offers a multi-disciplinary approach to creating a
secure environment that is both visually pleasing, but also safe. The model focuses on the use of access control, target hardening (building strengthening), natural surveillance (ability to spot suspicious activity) and the delineation of boundaries to offer more reliable sites. Blank walls, poor visibility, and weak lighting are examples of planning issues that CPTED tries to eliminate, ultimately reducing the opportunity for crime. Target hardening emerged as a popular way to reduce crime opportunity by making buildings ‘threatening’ to enemies. However, Jeffery dismisses this technique as the complete solution – as it created a hostile environment for everyday users (Jeffrey, 1977).

In comparison, Anti-Terrorism planning is a relatively newer phenomenon, growing significantly in the post 9/11 political climate. It sometimes relies solely on target hardening as a mechanism of defense. In a 2006 article on urban design and counterterrorism, Hockenberry and Hopper assert that anti-terrorism interventions should utilize CPTED more efficiently because target hardening creates hostile spaces, instilling fear and creating a ‘failed space’ (Hockenberry, 2006). He notes that places fail when people are too frightened to linger in an area and in turn those who use the space are isolated, particularly in dense urban areas. Going back to the works of Jacobs, if the user is alienated and the space is empty, the space becomes more susceptible to crime (Jacobs, 1984). There is tension between the need for government to protect its citizens and to allow for ‘traditional’ and good urbanism in a free public realm, this presents a ‘wicked problem’ of planning in the wake of threats of terrorism in a post-9/11 urban context (Rothock, 2010).

It was not until recently that terrorism became a major research topic in urban planning; the majority of anti-terrorism documents were written after 2008. However, anti-
terrorism design is rooted in the 1980’s following embassy bombings in several countries, then the Oklahoma City bombings of 1995 (Rothock, 2010). Post 9/11, quick fixes to urban design were introduced and adequate design standards were implemented by the Federal Emergency Management Agency (FEMA) through the FEMA 426 document “A Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings” (Rothock, 2010). The report brought forward the method of “detect, deter, deny, devalue” to reduce threats. As a result, planning bodies like the US National Capital Planning Commission created site design documents to adapt the urban environment with this model. FEMA released a similar report focused on urban design to balance security needs and aesthetics (FEMA, 2007). These documents benchmarked similar reports from independent cities, planning bodies and government entities; such as Homeland Security or the Treasury Board of Canada. Modern AT is characterized by America’s militaristic roots as a setting for hardening; but has recently started to translate itself to coincide better with the public realm (Rothock, 2010). This report will explore the consolidation of the two to provide good and bad examples of the anti-terrorism design process.

2.3 US Embassy

The US Embassy is located at 490 Sussex Dr. and was constructed in 1999. It is located east of the Parliamentary Precinct, next to the Connaught Building, opposite Major’s Hill Park and is in the ByWard Market. Map 2.1 Illustrates its location in the Ottawa context. The surrounding land uses range from institutional buildings like the museums, a church and government buildings to hotels, parklands and mixed use commercial and residential, offering a broad range of uses and tenants in the area. The building is
bordered by Sussex Drive, Mackenzie Avenue, and Murray Street. This stretch of Sussex Drive is part of Confederation Boulevard, a ceremonial route that links many important components of Canada’s Capital. The building was designed by David Childs of Skidmore, Owings, and Merrill in an architectural style meant to reflect the close relationship of neighbours, it mimics the architecture of the National Gallery across the street with its glass roof and attempts to blend with the Sussex Ave streetscape through its height. However, it’s often observed that the building is quite overpowering due to the scale of the building, the large building on a small site and the extensive security measures on the perimeter of the building.

The Embassy was previously located at 100 Wellington Street; across from the centre block of Parliament. This prestigious address is surrounded by important political structures such as the Rideau Club and the Langevin Block. The American embassy on Wellington was the first foreign mission in Canada. It was established in the 1930s, and symbolizes the importance of the relationship between Canada and the US. The 100 Wellington building, designed by Cass Gilbert, is regarded as a fine display of Beaux-Arts style architecture demonstrated by its symmetry, arches, limestone cladding and stonework details. In 1998, the Embassy moved to its new address due to the age of the previous building and the need for larger accommodations. Generally, embassy sites are chosen by countries to reflect the relationship between the two countries. This new site, while larger than the previous still had to present a comparable importance to their old site in terms of representation, the new site, overlooking the Parliament and other national symbols offers a similar relationship between the buildings, but features an large building on a small urban parcel. If this site would have been chosen a few years later, the US
would have never built the Embassy on such a small site in an urban area due to security concerns. On this note, the addition of major security features of the building can be credited to the political climate of the times stemming from; the 1985 Turkish Embassy attack in Ottawa, an embarrassment for Canada that called for better diplomatic security and, more importantly, the 1995 Oklahoma City bombing, an example of devastating home-grown terrorism that pushed the designers of the US Embassy to include the addition of major security features for the new building. The 1998 US Embassy bombings in Africa also pushed the designers to add an extra layer of security to the building. This addition of security features was supplemented by the events of September 11th, 2001 – spawning the need for a change and addition of security elements, in the Embassy and throughout the world.

Map 2.1: Geographic location of the US Embassy in relation to Parliament Hill in Ottawa. This distance is approximately 800m or 8 to 10 minutes of walking (Bing, 2017).

The new building does follow the guidelines outlined in the Ottawa Official Plan and supporting documents, however, it’s important to note that embassies are more
regulated by Global Affairs Canada (GAC), and do not hold extraterritorial status. The donation of the land from the Canadian government and diplomatic nature of the site allowed for more leniency in the design of the building. From a planning context, the replacement of a surface parking lot by an architect-designed embassy also provides the City of Ottawa with an ‘upgrade’ to the previous tenant. It is possible that embassies could choose to declare diplomatic immunity. However protocol is to abide by local rules. Therefore, most embassies still conform to rezoning rules, site plan approval and building or heritage permits as required by the City of Ottawa. Furthermore, properties controlled by the National Capital Commission (none in the case of this work) would have to undergo a different set of approvals.

The acquisition of real property for the purposes of consular premises and residences are regulated through written consent by GAC (Office of Protocol) as well as Public Services and Procurement Canada under the appropriate regulations. In the regulations, its outlined that “a confirmation that the use to which the real property will be put does not contravene applicable local laws, including but not limited to provincial or municipal by-laws regarding zoning, historical conservation and safety” (GAC, 2015). Moreover, the RCMP also reserves the right to comment on the location of the diplomatic mission to uphold the security standards required by current policies.

The reason for choosing the new US Embassy as a case study is the prominence and proximity of the building to Parliament Hill, as well as its presence in a pedestrian-rich environment. The US Embassy is located 800m from Parliament Hill, a 10 to 12-minute walk. Other embassies are located farther along Confederation Boulevard where there is less pedestrian activity, hence having a less noticeable impact on the public realm.
Furthermore, the US Embassy was also chosen due to the political climate and western-culture of the country. Since 9/11 the US has increased security in embassies, and within their cities, so, the study of this embassy would prove to be more interesting than a country with less risk of attack and fewer security measures, fueling a deeper analysis of the use of multiple levels of crime prevention in an urban setting.

### 2.4 British High Commission

The British High Commission is located at 80 Elgin Street and was constructed in 1964. It is also located on Confederation Boulevard, on the military parade route to Parliament Hill. The building faces the National Arts Centre and the War Memorial to the northeast. Map 2.2 Illustrates its location in the capital core. The surrounding land uses vary from mixed-use commercial and residential to government offices. The area is quite active from these uses, and it is also a major public transit hub, making the area very pedestrian-rich, more so than the US Embassy. The British High Commission building, designed by Eric Bedford for the British Government, is an example of modernist architecture. It has only very slightly changed over the years, contributing its understated façade to a sea of office towers and monuments. The architecture is representative of post-war modernist British design, and the front façade was sympathetically redesigned in 1980, and subsequently, 2005 to include additional security features by MCROBIE Architects, commissioned by the British Government.
The building was not initially surrounded by the high-rise towers it is today. It was constructed in 1964 as one of three mid-rise buildings on Elgin Street, including; the Lord Elgin Hotel (1941) and the Lorne Building (1959) (Gordon, 2015). The surrounding environment included heritage buildings, landscaping and a parking lot. The site was close enough to the parliament to imply a symbolic relationship between the two nations but not as close as the original US Embassy. Facing the War Memorial was considered an asset and honour, and could, in theory, also symbolise the partnership of the two countries. As the urban setting intensified, there were changes to the landscaping, including the parking at the back of the building. Changing political climate and fears prompted the addition of hardened features and security measures. But, in comparison to the US Embassy, the BHC’s security design has the advantage of time – the building was constructed in a time where threats of terror were less prevalent than in the years preceding the construction of the [new] US Embassy, thus appearing less aggressively secure. This is demonstrated by the need for security updates in recent years that match

Map 2.2: Geographic location of the British High Commission in relation to Parliament Hill in Ottawa. This distance is approximately 450m or 10 minutes of walking (Bing, 2017).
the defining character elements of the building and area. The building also follows local planning policy, but, due to the age of the building, the site was constructed under different policies and circumstances than the US Embassy, but, if changes were proposed in the future, they would have to conform to the current municipal regulations. Moreover, as stated above, GAC oversees the building and acquisitions of real property for diplomatic missions, thus, regulations of real property are to be followed in the same way.

The British High Commission was chosen as a case study because of the size of the buildings and its location in relation to Parliament Hill. Similarly, it was also chosen because of its urban context and place in the public realm. The site is located at a 7 to 10-minute walk to Parliament Hill at a distance of approximately 450m (Google, 2017). The High Commission was also chosen because of Britain’s political resemblance to Canada and the US, as well as its level of terror threat (that an attack is imminent) – therefore giving the researcher a better opportunity to examine the use of security features.

Map 2.3: Locations of the Peace Tower of the Parliament Building in relation to both the US Embassy and British High Commission. In this map [you] can see the ceremonial route, the National Gallery of Canada in the top-left corner and the building heights and densities surrounding each site.
3 METHODS
3.1 Introduction
A qualitative research approach was used to examine the use of both CPTED and anti-terrorism planning in the built environment of the core area of the City of Ottawa. This chapter outlines the methods used to collect the data and analyzes its results. A modified version of built security checklists were used to perform and analyze the site audit.

This chapter discusses the case selection, the research questions, a literature review, the site audit method and criteria. The extension of the research findings is discussed at the end of the chapter as generalizability of results.

3.2 Case Selection Rationale
The qualitative research of this report is based on a comparative study of two embassies in Ottawa, the US Embassy and the British High Commission. However, as Baxter (2010) notes, case studies are a research design theory – and not a method. In other words, case studies will ultimately inform and supplement the chosen method. So, the conclusions drawn from each is used to assist in the determination of effective security planning practices through the following methods. A case study approach was chosen in correspondence to Yin’s (2009) case study design considerations: it answers the “how and why” questions, and covers contextual conditions of the area when the boundaries between the phenomenon and the context are unclear (Yin, 2009). Multiple cases have been chosen to explore the similarities and differences between the cases and to generate recommendations stemming from multiple sources of information (Yin, 2009). Only two cases were selected to maintain a manageable qualitative study.

The cases chosen are based on their location, use, level of importance and level of threat in order to provide a consistent basis for analysis. Both embassies have strong
similarities as they are located within 1km of the Centre Block of Parliament, are used for diplomatic missions from western countries under a similar level of threat (that is the threat of an attack is highly likely) (MI5, 2017; DHS, 2017). In Canada, the threat level is “medium” so, a terror attack could occur – this has been the same since the events of October 2014. This forms a strong basis for the contextual analysis of CPTED and capital planning. By comparing the two cases, each embassy is used as a benchmark against the other, and which one better implements the use of CPTED can be assessed. This comparison is outlined through a site audit as well as photographic evidence comparing the similarities and differences between the key security features of the embassies.

3.3 Research Question

CPTED is relevant to compare with anti-terrorism security as it’s an extension of successful anti-crime techniques ultimately affecting security planning. CPTED is useful for public security of embassies because it’s easily translatable to the public realm in terms of crime deterrence. Supplementary to this, the application of security and CPTED to the embassies is based on their physical circumstances that they are located in an urban setting, constantly surrounding by people – rather than in a secure remote location, thus reinforcing my decision to incorporate the two theories. Based on the anti-terrorism lessons learned from CPTED, the main question to guide the research, noted in the introduction is:

Which embassy best incorporates anti-terrorism security and CPTED?

Essentially, the objective is to further consolidate security and CPTED to analyze the use of successful crime-prevention techniques in an urban environment through the comparison of two similar at-risk and high-profile buildings located in this setting.
3.4 Literature and Document Review

A literature review on CPTED theory, safety and security planning [post 9/11] was conducted to establish a better understanding of the topic, and provide a framework for the case and research study of this topic. The literature review highlighted the work of MIT Student Sara Rothock on CPTED and Anti-Terrorism planning in two American cities (Rothock, 2010). The security plans of various international planning bodies and the urban design and security plans for Washington D.C by the Federal Emergency Management Agency have also been studied. The review of this work provided insight into the link between post 9/11 security planning and CPTED. Other key planning and anti-terrorism texts were examined such as Trevor Boddy’s Hardened Sites and Softened Symbols (2007), Coaffee’s The Visibility of (In)security: The Aesthetics of Planning Urban Defenses Against Terrorism (2009). This review derived examples and best practices to use as a basis for the site audit and guide the findings of the report. The major findings of the links in the literature and document review are outlined below:

In terms of security, there is an explicit link in the reviewed literature to CPTED. This link is noted in Rothock’s thesis through the statement that:

“CPTED endeavors to create a heightened cognizance of an environment and provide visual clues to both potential victims and potential offenders in order to avert crime” (Rothock, 2010).

As well, she notes that the seemingly crime-producing areas created by anti-terrorism design benefits from CPTED as an intervention to deterrence of day-to-day crime. In addition, the Federal Emergency Management Agency’s 426 document claims that:

“although CPTED principles are not incorporated into the assessment process presented herein, it is useful to briefly discuss CPTED because it is often entwined with terrorism protection measures. Indeed, many antiterrorist design approaches
are similar to those found in CPTED” (Federal Emergency Management Agency 2003, 2-59).

Ultimately, the FEMA document underlines the importance of the consideration of CPTED to optimize security design. This statement supports that security planning in recent times has built upon that foundations of CPTED, therefore reinforcing the proposed methods.

An assessment of the CPTED principles from the literature review is the basis for the evaluation criteria and theoretical framework for the report on the case studies. In terms of CPTED principles, the criteria examined were carefully selected as being the most appropriate and topical criteria in anti-terrorism planning related to the sites. The categories chosen are explained further in section 3.6 and are: target hardening, access control, environmental support, surveillance and real/symbolic boundaries (RCMP 2016). These criteria are also found within the literature on anti-terrorism planning such as both the FEMA documents, National Capital Planning Commission’s Urban Design Guidelines for Perimeter Security in the National Capital (2004) or Designing and Testing of Perimeter Security Elements (2004) as well as Gulak’s Preventing Terrorist Attacks to Critical Infrastructure using CPTED (2007).

This literature on the design of embassies, CPTED and post 9/11 security, was the foundation for a set of guidelines that are relevant and useful when comparing the embassies. Theoretically speaking, some of the best practices in security mitigate CPTED and anti-terrorism to protect the outer shell of a building. For example, in “reference

Figure 3.1: an example of hidden bollard best practices (FEMA 2003, 2-57)
manual to mitigate potential terrorist attacks against buildings” (FEMA 2003) – many CPTED principles are outlined through a table depicting the various target hardening measures.

### 3.5 Site Audit Method

A first site audit was performed in the Fall of 2016, followed by a second audit in the Spring of 2017. The researcher spent some time at each site observing and photographing the built form for the purposes of analysis. This involved studying the perimeter of the site as well as studying the surrounding buildings and the pedestrian usage of the area. To evaluate and organize this, the site audit criteria was used as a table and checklist (available in Appendix II) to inform the analysis.

### 3.6 Site Audit Criteria

The site audits considered these guidelines, Treasury Board of Canada’s Threat Risk Assessment Criteria (2014), the standards outlined in the literature review and the four anti-terrorism strategies outlined by the Federal Emergency Management Agency (FEMA) (FEMA 2003, 1-9). These four strategies are:

<table>
<thead>
<tr>
<th>Deter</th>
<th>Detect</th>
<th>Deny</th>
<th>Devalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deter terrorists from targeting the area through it’s design</td>
<td>Detect and monitor potential threats</td>
<td>Minimize or delay the loss of life</td>
<td>Making the building appear to be of little value or consequence</td>
</tr>
</tbody>
</table>

Direct observation of the built environment and design features served as the basis for the analysis of the embassies, which has further evaluated through the guidelines and criteria created through the document review. The findings were compiled into tables in
to provide a clear visual comparison and understanding of how the principles and criteria have been applied each site for future use in the report.

Stemming from this research, an analysis of the use of the chosen CPTED principles was used to supplement the findings from the previous table. As a case comparison with a qualitative approach, this method informs the research question, ultimately helping to define the best practices of the incorporation of security and planning. Within the table, five CPTED principles are outlined as follows:

**Target Hardening**
Identifying a hierarchy of power and visual permeability dependent, reinforcement for the building, visible defense. This is done through fences, bollards, armed booths and tactical reinforcement (RCMP, 2016)

**Access Control**
Limiting the opportunity for crime by delineating space, creating a barrier between the terrorist and the building itself. Using structure to divert and control others. (RCMP, 2016)

**Environmental Support**
A design that takes into account its surroundings, such as limiting the use of the building for conflicting uses and maintenance of ‘eyes on the street’, increasing surveillance opportunities. (RCMP, 2016)

**Real/Symbolic Boundaries**
Identifying ownership of the space through real or symbolic boundaries. This creates both a physical and imagined barrier – taking away the opportunity for crime. (RCMP, 2016)

**Surveillance**
Maximizing the ability to spot suspicious people and activities. This is done through CCTV, Security Officers, windows, booths and open space. (RCMP, 2016)

### 3.7 Policy and Urban Design Guideline Review

Building upon the previous methods, an analysis of the policies and urban design guidelines from the City of Ottawa (2006), the National Capital Commission (2005) and
various federal departments (PSPC, 2006) served as supplementary information on security planning. Furthermore, the urban design guidelines provided additional criteria when observing and evaluating the sites according the the described criteria. Policy from various federal departments helped guide this work, using the standard risk assessment practices used in a Canadian context. On an international scale, public safety, CPTED and anti-terrorism planning policy from other cities similar to Ottawa was examined in order to have an in-depth understanding of the application and effectiveness of security planning in capitals. The international planning documents included Canberra’s *National Capital Security Plan* (2003) and the National Capital Planning Commission’s *Urban Design and Security Plan* (2002) for Washington D.C.

3.8 **Strengths and Limitations**

The research method used has many strengths, but, due to the nature of the study and the highly classified nature of the sites, there are some limitations;

- The scope of the research: It is limited to the two chosen embassies on Confederation Boulevard. Given this criterion, I am only considering their built form and therefore limiting similar studies and findings from embassies in an international context as well as case studies including other high-risk embassies and government buildings in Ottawa.

- Out of date documents: The primary CPTED design guidelines and implementation documents used for this work were written before 9/11. This information could be seen as outdated and not relevant to the application of the principles nowadays. To mitigate this, multiple sources that outline the application of CPTED in a post-9/11 environment are be addressed.
Special Limitation – The Case Selection:

Due to the highly classified and secure nature of this study, the case selection is a limitation that requires more detail and understanding. The diplomatic nature of the sites provides the following limitations:

• Security: Some areas of the studied sites are inaccessible to the public. I was not able to access certain parts of the site (i.e.: parking garage, indoors, service entrances…).

• Classified information: Due to the nature of the research, some of the information is not available to the general public. Despite the researcher’s Secret security clearance, some of the documents and building specifications were ‘top secret’ therefore not accessible. There was some lapse in information on site specific parameters, such as very specific physical security features including interior safe rooms, secret defensible space or weaponries and hidden entrances/exits. Including this information may affect the mediums in which the report will be published.

• Publishing: The information included in the report may be deemed to be sensitive information and be limited in terms of mediums of publishing. That means that the report may not be able to be published on the Queen’s website and will only be available upon request.

3.9 Generalizability of Results

The generalizability of results depends on the style and type of research. In terms of qualitative research, generalizability is not the norm. According to Baxter (2010), the goal of case studies is not to necessarily have statistically generalizable results. However, they
provide an opportunity to deepen and expand the theories despite not being statistically iterative (Baxter, 2010 p.90). To ensure that the results of this study are generalizable to other potential studies, a thorough analytical framework has been created. Though the findings of this study will not be applicable to all embassies in western countries, they could be applicable to embassies and other high-risk governmental buildings similar to the ones chosen for this work.
4  **Site Audit Analysis of Case Studies**

4.1  **Introduction**

The purpose of this chapter is to present the findings from the site audit and conduct the analysis of the case studies. The sites were each audited, and the corresponding information was compiled and split into sections based on the methods outlined in Chapter 3. This includes a breakdown of FEMA’s anti-terrorism scale, then, the security indicators described in CPTED and Security planning (see Appendix A) for the complete evaluation of the sites. The analysis was informed by observation of the site, document review, and precedent analysis. On the scale of the site, it was assessed through photography and observations over several site visits. Table 4.1 is used throughout this chapter to visually interpret and compare the level of fulfillment of the selected categories from each embassy. The following section is the basis for the recommendations made later on in this report.

<table>
<thead>
<tr>
<th>Does not fulfill</th>
<th>Minimal fulfillment</th>
<th>Somewhat fulfills</th>
<th>Almost fulfill</th>
<th>Fulfills criterion</th>
</tr>
</thead>
</table>

Table 4.1: Evaluation scheme

4.2  **FEMA’s Anti-Terrorism Strategy Scale**

The Anti-Terrorism Strategy Scale originates from their document *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* (FEMA, 2003). The Four “D’s” of anti-terrorism were referenced in the previous chapter: deter, detect, deny, devalue. These carry distinct design repercussions, echoed by FEMA’s document on urban design (Rothock, 2010). In the case of the four D’s, they have been outlined with the purpose to be adapted to various scales. For this report, the scale was limited to a building and the immediate surrounding urban environment.
4.2.1 Deter

To deter terrorism at the scale of the building is to make the target inaccessible or difficult to defeat. As noted by FEMA it’s usually denoted by a site perimeter using highly visible features like CCTV, fences, barriers, security personnel and other visible security systems (FEMA, 2003). Together, these features would, in theory, deter attacks against the building.

Both buildings displayed high levels of fulfillment of deterrence. The US Embassy fulfilled the criteria completely whereas the British Embassy almost fulfilled the criteria outlined by the research. This was demonstrated by the presence of fences, visible security systems, cameras, barriers, and personnel.

The US Embassy was the most compliant with this criterion. At first glance, the building is an imposing piece of architecture that is very hard to miss if you are in the surrounding neighborhood. Upon further analysis, it’s evident that the building itself has a very intimidating aura. It is protected by a ditch, a fence, bollards, and an extra layer of trees in some areas. Furthermore, on Mackenzie Ave., the embassy benefits from an extra few metres of deterrence due to the addition of a bicycle lane in which the embassy has installed bollards, replacing the previous concrete barriers that had completely closed the traffic lane nearest to the building (US Embassy, 2016) (figure 3.1). This was done in partnership with the City of Ottawa and the National Capital Commission as a ‘greening effort’ in the City of Ottawa and an effort to make the embassy more visually appealing (US Embassy, 2016). This is one of the cases where anti-terrorism efforts are coupled with greening and help improve the environment and support sustainability through active transportation in the form of dedicated bicycle lanes. At the entrances, corners of the
building and roof there are visible security cameras and systems installed to monitor the area (Figure 3.2). On Sussex Dr., the more pedestrian-heavy area, the bollards extend out on the sidewalk, and the buildings main entrance is guarded by a United States Homeland Security officer observing the surroundings and checking the passports of the visitors of the embassy. On this side, the building’s parking garage also boasts a large amount of security features and is also guarded by a security officer. The combination of these elements at the scale of the building and the surrounding urban environment are a good example of measures used to deter or make the building seem inaccessible from attacks.

The British Embassy was a little less compliant with the ‘deter’ criterion than its counterpart. Despite seeming very secure from an audit of the building’s exterior, the building’s physical security systems did not particularly stand out as much as the US Embassy, there is a fence around the main entrance of the building, as well as a reinforced parking lot. Trees act as a barrier along Elgin Street, and the sides of the building are protected by Jersey barriers. There are bollards around the entrance of the
building and reinforced street furniture, citizens might not see the security features unless that looked closely.

Although there are visible cameras, they are somewhat hidden or too high for the average pedestrian to notice and feel as though they are being monitored at all times. While analyzing the outside of the building, the researcher did not note any outside security personnel. While the building does attempt to deter individual attacks through the core design elements mentioned above— it does not give off the same sense of inaccessibility that the US Embassy boasts. The building does a better job of blending into its surrounding environment and incorporating the security features into the streetscape. However, it does deliver a sense of security and thus could achieve a partial deterrence of terrorism activity. This can be noted in figure 4.3, where the addition of a retaining wall providing an effective anti-vehicular measure. The measures seen below were added to the original façade of the building – as a need for a security retrofit has arisen in recent years.

Figure 4.3: Fences and retaining wall in front of the British Embassy

In 1961, the retaining wall, fences and front entrance are not present (Figure 4.4). However, in the original design of the BHC, the black marble lines the front of the building. Following a security retrofit, planters in the same black marble were implemented to act
as anti-vehicular and terrorism mechanisms – especially along the corners of the building and the entrance. The fences and reinforced stairs were also added to supplement the grading and safety of the entrance.

Figure 4.4: Front view of High Commission from Elgin Street (Unknown, 1964)

Figure 4.5: Model of High Commission from Elgin Street (Unknown, 1961)
In short, as noticed in the site audit, the US Embassy has many elements that would deter an individual from targeting the building, but it does not integrate itself into the surrounding urban environment. In comparison, the British Embassy has many of the essential elements of deterrence, but, because of this, still fosters a sense of dissuasion through the hardened environment. This can be observed in figured 4.5, there is a change in grade, steps and a retaining wall that would effectively deter vehicular attacks. When researching and observing the BHC and the US embassy building, the environment feels quite different.

![Figure 4.6: Sussex Dr. entrance of the US Embassy.](image)

Auditing the BHC, I felt like a tourist observing the environment and did not feel like I had been doing anything wrong when taking pictures of the façade, cameras and use of the area, despite Britain currently being designated under the same level of high security threat by their respective security departments [that is- an attack is ‘likely’]. In contrast, the US embassy made me feel a little uneasy, as if someone was going to come

![Figure 4.7: Front entrance of the British Embassy.](image)
out and scold me or even detain me for some sort of espionage. This feeling was more pronounced on the Mackenzie Avenue side of the building, as it was deserted other than construction workers. On the Sussex Drive, side, a security guard observed [me] taking pictures, so [I] also took photographs of the neighboring Connaught building, in order to seem like less of a threat. That spontaneous reaction demonstrated that the construction and design of the building does a very good job at achieving a sense of deterrence through the ‘threatening’ appearance of the building.

From this analysis, according to the criterion, the researcher has chosen that the US Embassy totally fulfills the criterion of deterrence and the BHC partially fulfills this criterion. In terms of planning, this is because the US Embassy deliberately implements the principles of security planning in a more visible nature than the BHC. The BHC does not completely fulfill the criterion because of its less imposing nature on the surrounding urban environment, despite employing many anti-terrorism principles following a security retrofit of the building.

4.2.2 Detect
The concept of ‘detect’ stems from the ability to detect and monitor potential threats. This is demonstrated through the use of CCTV, security guards, control points, access points, and controlled parking.

Both embassies fulfill this criterion – as they are both equipped with the necessary elements to detect potential threats. The US embassy has more common and apparent security features like the numerous CCTV cameras and the armed security personnel standing outside the front entrance and parking facilities. The British Embassy has fewer
CCTV cameras and no visible security guards, however, the staff are located inside booths near the parking facility. Both benefit from access points and one main entrance where pedestrian traffic can be monitored. Furthermore, the parking facilities are heavily controlled – the British control this through the use of electronically powered fences, whereas the US has a more intense system, which the researcher could not see past the outside. However, the outside features include retractable bollards, a security person who thoroughly inspects the entire vehicle and a controlled entrance way that is comprised of two doors that [the researcher assumes] is used for a more thorough inspection of the entire vehicle.

The use of CCTV with the US embassy building is much different than that of the BHC, which has a subtle placement of the cameras to detect potential threats. In contrast, the US embassy utilizes the cameras as a form of deterrence. The very visible measures of detection evoke a sense of unease, as they are common fixtures on the surrounding streetscape. This strategy used by the embassy, therefore, increases the deterrence and reduces the opportunity for crime.

Both missions totally fulfilled the criteria, as they implemented anti-terrorism detection principles into their building and surrounding environment. While their approaches differ in nature of visibility and rigour, the same effect is produced. And that is measures to detect crime at the level of the building and the surrounding urban environment, ultimately effectively using surveillance to their advantage, and reducing opportunity for crime.
4.2.3 Deny

‘Deny’ refers to the ability to minimize or delay damages to the building or loss of life. This is carried out through fences, bollards, blast-proof walls behind reinforced glass, multiple entrances, reinforced construction materials and hidden security measures. Due to the nature of the research, only fences, bollards, doors and construction have been identified.

The US Embassy is by far the most heavily protected by these measures. There are many apparent systems set up to minimize damage to the building and loss of life. These systems include the fences along the perimeter of the building, the bollards along Sussex Dr. and Mackenzie Dr. As mentioned earlier, the addition of a bicycle lane along Mackenzie creates an extra layer of functional security, contributing to this criterion. The multiple entrances also serve as an additional security feature, especially since the main entrance is always protected by a security official on the street. The streetscape further supports the criterion as demonstrated by the ‘wiggle’ at the intersection of Sussex Dr. and Clarence Street. This newer traffic feature is a more elegant way to deny vehicular attack from straight on – the feature has been successfully implemented in areas such as London’s ‘Iron Ring’. Furthermore, the architecture of the building does include blast-proof walls on the inside of glass panes – thus further strengthening the criterion and still giving the impression that one is being ‘watched’.

On the other hand, the British High Commission boasts similar security features, however, due to its older construction and location, there is less space and opportunity to add extra anti-terror features. It does have bollards, fences, multiple entrances and security features. The researcher believes that this does not fully meet the criterion due to the proximity of the building to the street, as well as the lack of outside security. Upon
further analysis, this lack of features does contribute positively to the building, but, from a purely anti-terror point of view this does not contribute to the deny criterion.

<table>
<thead>
<tr>
<th>Deny</th>
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<tbody>
<tr>
<td>US Embassy</td>
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<tr>
<td>British High Commission</td>
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The US Embassy completely fulfills the criterion for *deny* as it employs more anti-terrorism features at the scale of the building as well as the surrounding urban environment – it also evokes the sense of impenetrability. The BHC, on the other hand falls somewhere in the middle of the category, as it does use similar features, but the understated nature of the building does not help to contribute to the fulfillment of the criterion. Its proximity to a very busy street further contributes to this conclusion, if they truly wanted to deny, the location should have been moved elsewhere with the addition of setbacks.

### 4.2.4 Devalue

To devalue the building is to make sure that the building is not prominent nor a visible target, furthermore, this criterion also considers if the building is coherent with its surroundings or not. This was the weakest category in the site audit, because both buildings do advertise the fact that they are an embassy and are both quite prominent.

The US embassy failed to fulfill the criterion due to its prominence and lack of context with its surrounding environment. It is a large, well-designed building, and architecturally exquisite; however, it stands out in the historic ByWard Market area, therefore affecting its coherence with the surrounding environment. The embassy is large and imposing, not to mention, that the large fence and abundance of bollards make it very clear that it is an important building – and a very visible target.
The BHC on the other hand somewhat fulfills the criterion by having a less dramatic appearance. When walking along Elgin Street, the building appears to be similar to the other government buildings in the area – fitting with the context of the surrounding environment. The BHC fails to meet the full criterion because of the sign out front, as well as the fences around the building and the extra security features, attract attention to the building – therefore not completely hiding and devaluing the structure.

As an overarching theme in this work, the difference can be noted by the open different approaches used by the buildings. The British embassy opts for a less important look – thus devaluing the building. The US embassy aims to do the opposite, ultimately adding value to the building, but using these tactics as a measure of crime prevention.

In terms of this criteria, the US Embassy does not devalue its building, and, therefore, the BHC is evaluated as the more effective. Despite the US’s building being a visually appealing addition to the ByWard Market, its grandeur does not go unnoticed, thus, not devaluing the importance of the building.

### 4.3 Evaluation and Implications for Planning

<table>
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<th>Deter</th>
<th>Detect</th>
<th>Deny</th>
<th>Devalue</th>
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<tbody>
<tr>
<td><strong>US Embassy</strong></td>
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<td><img src="chart1.png" alt="Chart" /></td>
<td><img src="chart1.png" alt="Chart" /></td>
<td><img src="chart1.png" alt="Chart" /></td>
</tr>
<tr>
<td><strong>British High Commission</strong></td>
<td><img src="chart1.png" alt="Chart" /></td>
<td><img src="chart1.png" alt="Chart" /></td>
<td><img src="chart1.png" alt="Chart" /></td>
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As implied by the chart above, the US Embassy is better at the fulfillment of the criterion. However, the BHC does prove to be quite similar in terms of fulfillment. This is mostly due to the fact that the US Embassy was built much more recently and has
benefitted from a larger lot size and the ability to customize the needs and security features of the site. The BHC retrofit has achieved this in some sense, but there is still a long way to go to mimic the security measures of the American site. Upon further evaluation, these differences could also be due to the culture of each respective country – an imposing building depicting power like the US, or a more understated building, which works with the surrounding environment like that of the BHC.

In terms of implications for planning, examples from both foreign missions can be implemented elsewhere. The dedicated bicycle lanes on Mackenzie Ave. and the traffic calming measure in the ByWard Market add an extra layer of security and are visually appealing or even unnoticeable to the average user of the area. On the other hand, strategic greening and urban design, similar to that used at the BHC can be easily implemented and offer an aesthetically pleasing method of security planning.

4.4 Indicators and Elements of CPTED and Security Planning

This section will explore more in-depth the site audit with the tools and implementation as well as the purpose of each criterion. It will include an analysis of the use of these criteria by each embassy, the elements in order are; target hardening, access control, environmental support, real/symbolic boundaries, and surveillance.

4.4.1 Target Hardening

Target hardening aims to identify a hierarchy of power by seeking to reinforce the building visibly and structurally (RCMP, 2016). This is similar to the notion of deterring and denying as outlined in the previous section.

From the visual analysis, the US embassy is very successful at both visually and structurally using target hardening. Firstly, the hierarchy of power is not only visible but
also felt through the impression of increased security. The building itself appears to be an impenetrable fortress – one that you can only enter if you have been invited. This is achieved through the bollards, high fences and reinforced exterior through construction as seen in figure 4.8. The hardened bicycle lane is a subtle use of this, upon examination – it adds an extra layer of hardening between the street and the building to the less busy and more vehicular-focused side of the embassy. To the researcher, other than the visible fences, the bicycle lane bollards are what stood out the most, from a planning point of view. The Embassy took advantage of an initiative to increase security around the perimeter of the building. This building proves to be an excellent example of the use of target hardening, as it is visually dominant in the area, and also exudes a feeling of security from the fences, bollards and reinforced elements. This, coupled with its deterrence, helps establish visual power to the building and reduce the opportunity for crime since it increases the level of difficulty in attacking the building. As an American tourist said to the researcher – to him, he was “appalled” that the US Embassy seemed as big as the Parliament and looked more dominant.

Figure 4.8: Reinforced exterior of US Embassy (Fall, 2016)
Target hardening is less visible in the BHC – due to the surrounding urban environment and the year of construction. The BHC was constructed much earlier, in a time less concerned about terror (but more about espionage). The streetscape does not support the use of fences, so they have supplemented this through the use of bollards and jersey barriers around the side of the building. There are fences, but this is to protect the parking lot at the back of the building. Due to the location and restriction on fences of the building, they have chosen to employ a target hardening through natural features like trees. Within this category, both missions are similar, however, the US Embassy prevails at offering the most target hardening. The blast-proof walls outlined in literature, bollards, fences and other security features all contribute to making this building the ‘fortress’ it appears to be. Furthermore, the planning features at the level of the streetscape contribute to this notion as well.

<table>
<thead>
<tr>
<th>Target Hardening</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Embassy</strong></td>
<td>![Blue Circle]</td>
</tr>
<tr>
<td><strong>British High Commission</strong></td>
<td>![Green Circle]</td>
</tr>
</tbody>
</table>

### 4.4.2 Access control
Access control looks to delineate space, create a barrier and use the structure to divert and monitor the utilization of the space (RCMP, 2016). This is achieved through target-hardening measures, along with basic detection measures like control booths, secure entrances, other entrances, fences and access points. The use of access control
is more concrete, as it focuses on the physical delineation of space. By interacting with the urban fabric, this means of security, if used correctly, helps divert the users to controlled areas (RCMP, 2016).

Both embassies benefit from the excellent use of access control and fulfill the criterion. However, they use different methods due to the layout of the land occupied by each. The US embassy has a much larger lot than the BHC – therefore has to control access to a much wider area, comprised of lawns and multiple entrances.

The US embassy does this by having two entrances to the building, one for the public located on Sussex Dr. and another on Mackenzie Ave. This moves the influx of people to a well-monitored area surrounded by ‘eyes’ such as pedestrians on the streets. The barrier is further reinforced by the addition of fences on the perimeter of the building – forcing the users towards the controlled access points such as the doors or parking garage. A certain feeling of security comes from the design of the area, in particular through the fences, access point and through the landscaping of the area, which ultimately distorts the visibility inside the building – further reducing visual access to the building.
In comparison, the BHC achieves this level of access control on a smaller and denser surface area. The height of the building plays to the advantage of the structure, as it provides sufficient visual access, by limiting a pedestrian’s view to eye-level. The access point located on Elgin St. offers the public only one visible entrance, guarded and secured by an officer. The fence around the parking in the rear also routes users to the one access point, therefore using the streetscape to reinforce the notion that the area is constantly guarded and is inaccessible. The use of the change in grade of the building offers support to the front of the building supplemented by steps and a retaining wall to control the access to the main entrance of the building. The access control of the building is well thought out, considering the challenges of the urban environment – it makes a building ‘inaccessible’ all while maintaining a look that meshes with the surrounding buildings and blocks. It essentially creates the feeling of just another non-descript building or a building that is of some importance so that passer-by would not be tempted to go in. This is very successful in fulfilling the criterion of access control – as it is using the visual impact and height structure to allow its users to monitor the space on that block of Elgin, using a barrier made of target hardening and landscaping, ultimately creating a well-secured and controlled environment.
Both embassies fulfill this criterion successfully – the use of anti-terrorism planning and CPTED features limit the access to the building, but also create a sense of deterrence to bystanders that the building is inaccessible, creating a controlled and secure environment.

4.4.3 **Environmental Support**

Environmental support refers to whether or not the design takes into account its surroundings or limits the different uses of the building (RCMP, 2016). Essentially, this means that the building respects Jacob’s ‘eyes on the street,’ natural surveillance, its surroundings and that it’s not creating a feeling of conflict in the neighboring urban space.

For the US Embassy, this was the weakest category – as the building itself, despite being very secure, does not incorporate this CPTED criterion very well. According to the literature, it does not blend into its surroundings effectively. It does serve well for anti-terrorism, as it does create a sense of security in the environment. The reason it doesn’t fulfill the criterion is in part due to its location, and due to the nature of the building. The embassy is located in the downtown core, within an area that also boasts many heritage buildings. So, the presence of a new facility is already diminishing the environmental support of the area from Sussex St. Along Mackenzie Ave. However, the building mimics that the National Gallery and does not overpower the silhouette of the Parliament Buildings in the Ottawa skyline. According to the architect, it is meant to represent town and crown with the limestone façade near the ByWard Market and the glass façade facing the National Gallery (Gournay and Loeffler, 2002). It also supports the environment in terms of design on Sussex Ave. It has a similar colour, height and type of window than its heritage counterparts on the opposite side of the street.
From a CPTED point of view, the building does do a good job at maintaining natural vegetation. Nevertheless, it does not do a good job at seamlessly integrating itself with the surrounding environment, despite its best efforts of eliminating blank walls by installing window panes. As noted in Gournay and Loeffler (2002), the architects tried to create a ‘low profile’ building in the background, with the addition of a ‘skyline feature’ as required by the NCC. This attempt, upon further analysis, is overpowered by the security features and the size of the US Embassy compared to the adjacent fabric of the street. It only fulfilled half the criteria due to its commitment to the anti-terrorism principles.

The BHC commission, on the other hand, is substantially better at environmental support, from the CPTED and anti-terrorism standpoints. By creating a secure environment through the surrounding urban fabric, the building fulfills the anti-terror criteria. Regarding CPTED, it is successful by not totally disrupting the environment through security. As iterated before, when walking past the embassy, its purpose seems inconspicuous, but once the purpose is known, there is an overarching sense of security,
not only through hardening but environmental security – as it supports its surroundings, promotes natural surveillance in its vicinity, and the building is similar in size to the adjacent buildings. This is achieved through the landscaping, but also though the way the building is secured by seamlessly integrating it into the natural environment.

The integration is prevalent in the hardening of the entrance. Instead of increasing the level of bollards and fences, the entrance is raised and protected by large reinforced 'planters.' What appears to be strategic landscaping is cleverly placed target-hardening and access control from a recent reconstruction of this older building. Its success is due to awareness of the public realm, eliminating blank walls and heavily-visible security features. A secure environment is masked as a good-looking entrance.

Figure 4.12: Surrounding urban environment of the British High Commission in contrast to the surrounding core area. (Google, 2017)

The researcher believes that the difference between the two cases stems from the nature of the construction and the time of development. The US embassy was constructed recently, and in a time where these security features were indispensable in
the creating of foreign missions. Furthermore, they had the opportunity to totally customize their building on vacant grounds, offering more opportunities for security measures.

The BHC’s building was constructed in 1964, before the US embassy on Sussex Dr. At the time, the building was in a prominent location, opposite the Canadian War Memorial. Therefore, the building has had to adapt to changing security trends. This, and the location of the building has thus forced it to opt for more conservative security measures – and in this case offer a better example of environmental support, all while being conscious of creating a secure environment. In turn, the US Embassy is a visually appealing building and does respect urban design ideals and planning principles in the heritage district, however, it is at a loss in this category due to its facade on the Mackenzie Ave. side of the building, and its lack of natural target hardening.

<table>
<thead>
<tr>
<th>Environmental Support</th>
<th>US Embassy</th>
<th>British High Commission</th>
</tr>
</thead>
</table>

### 4.4.4 Real/Symbolic Boundaries

Real and Symbolic boundaries are very similar to access control, but this has more to do with identifying a physical and imagined barrier around the building (RCMP, 2016). This means that there is not only the presence of physical barriers like hardening measures or booths, but there is also a suggested barrier implied by less conspicuous measures. Regarding anti-terrorism, the real and symbolic boundaries refer to decreasing the opportunity for crime. This is characterized by fences, delineation of public vs. private space, use of space, windows and signage. Both foreign missions received the same score (RCMP, 2016).
The US embassy partially fulfilled the criteria because it includes real boundaries but has less emphasis on symbolic ones. It fulfills real boundaries with their use of fences, delineation of space and use of signage. In turn, they are quite successful at deterring the opportunity for crimes because the area around the building is clearly defined by these hardening features. It does, however, lack the symbolic nature of these boundaries that could be achieved through more natural and less conspicuous measures. The only instances where a boundary is suggested are the bicycle lanes along Mackenzie Ave. Despite the use of bollards, the bike lanes can be mistaken as protection from oncoming traffic, but, they are not as cleverly designed as the planters at the BHC. The embassy receives most of the merit from an anti-terror point of view – rather than with good CPTED.

The BHC also only partially fulfills the criteria for the opposite reasons of the US embassy. The BHC is quite successful at establishing symbolic boundaries but is less successful at establishing real limits. As explained earlier this is due to the urban fabric and nature of the lot. The only way that the ‘real’ boundaries are delineated is in the parking lot at the back of the building – used for physical security and parking space security. On the other hand, the success of the symbolic boundaries is achieved due to the urban fabric of the area. The raised steps and planters offer a sense of private land vs. the public nature of the surrounding sidewalks. Furthermore, the trees along Elgin support this notion as it gives passers-by a feeling that the building is ‘guarded’ and that you are on private property, despite being in a busy public space. This use thus decreases the opportunity for crime because the users feel like they are in a space being ‘watched’ and guarded since they feel as though the are on public property. The use of windows
overlooking the area also exudes a feeling that one is being watched – thus delineating the immediate vicinity around the building. The BHC is, however, losing out on anti-terrorism, as they are unable to secure the perimeter of the building because of the use of sidewalks and building density of the area.

<table>
<thead>
<tr>
<th>Real/Symbolic Boundaries</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>US Embassy</td>
<td>[ ]</td>
</tr>
<tr>
<td>British High Commission</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

In terms of evaluation, both missions partially fulfill the criteria of real/symbolic boundaries. For the US Embassy this is due to its lack of symbolic boundaries. For the BHC this is due to its lack of real boundaries due to its location in the core of the city.

### 4.4.5 Surveillance

The last criteria is surveillance, that is maximizing the ability to spot suspicious people and activities (RCMP, 2016). This definition applies to both CPTED and Anti-Terrorism planning. The characteristics of this criteria include the use of CCTV, windows, increased security and monitored open space. This is very similar to ‘detect,’ and both embassies completely fulfill the criterion. For both cases, this is attributed to the urban environment, as well as increasing technological advances in security.

Figure 4.13: Visible security features of the US Embassy on the East and West sides (Fall 2016)
The US embassy utilizes security in a very apparent way – by including over 12 visible cameras on the perimeter of the building, as well as visible security officers. The window-clad building also contributes to surveillance, as it creates a feeling of 'being watched' when walking around the building. This features are actually an improvement on the use of blank walls at the grade of the building, which would have been the most effective measure of target hardening. Upon further analysis, it becomes evident that the use of monitoring in the building reduces crime by the sheer amount of surveillance measures presents – a user of the area feels at though there is no place or opportunity to hide. This very notion supports CPTED, as it reduces the opportunity for criminals to prosper, which, in turn, translates to effective anti-terrorism measures. If security personnel can spot and mitigate threats through visual surveillance, the chances, of a potential attack are diminished.

The BHS uses security in a slightly different way than its counterpart; it has a subtler surveillance presence in the area. This is achieved by the use of visible cameras on the perimeter of the building, accompanied by indoor security personnel and an abundance of windows. Furthermore, the trees along Elgin provide a surveillance ‘corridor’ along the front of the building, allowing surveillance to be narrowed to a more vulnerable zone of the building.

Both buildings are quite successful in implementing surveillance from a technological as well as an urban design perspective. However, despite these good uses of surveillance, it is imperative to note that despite these mitigation features, surveillance only goes as far as the equipment can see.
So, the implementation of this CPTED feature doesn’t necessarily alleviate vehicular or airborne threats.

### 4.5 Evaluation and Implications for Planning

<table>
<thead>
<tr>
<th></th>
<th>Target Hardening</th>
<th>Access Control</th>
<th>Environmental Support</th>
<th>Real/Symbolic Boundaries</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Embassy</strong></td>
<td><img src="#" alt="Target" /></td>
<td><img src="#" alt="Access" /></td>
<td><img src="#" alt="Environmental" /></td>
<td><img src="#" alt="Real/Symbolic" /></td>
<td><img src="#" alt="Surveillance" /></td>
</tr>
<tr>
<td><strong>British High Commission</strong></td>
<td><img src="#" alt="Target" /></td>
<td><img src="#" alt="Access" /></td>
<td><img src="#" alt="Environmental" /></td>
<td><img src="#" alt="Real/Symbolic" /></td>
<td><img src="#" alt="Surveillance" /></td>
</tr>
</tbody>
</table>

Table 4.2: Comparison of criteria of BHC and US Embassy

From the evaluation, the British High Commission is slightly more effective at the use of CPTED than the US Embassy. Both were very similar, however, the lack of environmental support from the US Embassy was the determining factor. However, the US was more effective at target hardening, even forgoing some target hardening techniques in favor of windows to offer more surveillance and environmental support.

In terms of the implications for planning, in summary, the BHC demonstrates that adaptation of CPTED can be implemented in a way that meshes well with the surrounding urban environment (Table 4.1). This can be done by creating a space that is secure but done so inconspicuously and beautifully. This is demonstrated by the natural target hardening of the area, creating an enjoyable pedestrian environment. By installing less conspicuous measures of CPTED, as well as respecting the pedestrian realm, as noticed in the BHC security can be respected at a more human scale, all whilst delineating boundaries, spaces and access.
### Table 4.3: CPTED Strengths and Weaknesses

<table>
<thead>
<tr>
<th></th>
<th>US EMBASSY</th>
<th>BRITISH HIGH COMMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strength</strong></td>
<td><strong>Weakness</strong></td>
<td><strong>Strength</strong></td>
</tr>
<tr>
<td><strong>Target Hardening</strong></td>
<td>• A variety of hardened features are present</td>
<td>• A variety of hardened features are present</td>
</tr>
<tr>
<td></td>
<td>• The building itself boasts physical security features</td>
<td>• The physical security features are very understated</td>
</tr>
<tr>
<td><strong>Access Control</strong></td>
<td>• There is a visible delineation of the area that is easy to understand</td>
<td>• There is a visible delineation of the area through fencing and security</td>
</tr>
<tr>
<td><strong>Environmental Support</strong></td>
<td>• The building design attempts to integrate itself into the surrounding land uses through architecture</td>
<td>• The buildings integrate itself into the surrounding environment</td>
</tr>
<tr>
<td></td>
<td>• Landscaping</td>
<td>• A conscious effort to mask security features has been made</td>
</tr>
<tr>
<td><strong>Real/Symbolic Boundaries</strong></td>
<td>• Fences and bollards delineate the area</td>
<td>• The use of landscaping and public realm design helps delineate the area</td>
</tr>
<tr>
<td></td>
<td>• Security features add to symbolic boundaries of embassy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Landscaping</td>
<td></td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td>• Lots of surveillance to deter and monitor terror</td>
<td></td>
</tr>
</tbody>
</table>
5 Conclusion and Recommendations

5.1 Introduction
Based on the findings in the analysis of the site audit of the US Embassy and the British High Commission, this chapter outlines conclusions about which case implemented CPTED and security planning most efficiently. It then makes a set of recommendations for better addressing CPTED and security planning in a post 9/11 urban context. The chapter concludes with a summary of findings, as well as limitations and suggestions for future research opportunities.

5.2 Research Outcomes
The objective of the research project was to study and address security planning in Ottawa to identify the best practice to incorporate AT Security and CPTED in an urban environment to create a set of recommendations for future use. The research aimed to answer the following question:

Which embassy best incorporates both AT Security and CPTED?

From the analysis, it is evident that both embassies were successful in the implementation of Security and CPTED. However, it’s important to note that both embassies implemented these in two very different ways. This is due to the construction date and surrounding urban environment. The US Embassy benefited from a large lot and was constructed in the last twenty years – therefore offering more opportunities for the customization of security features. Furthermore, their approach to security is to adopt more of a clear and hardened approach, which, in turn, increases their initial level of deterrence but decreases their level of environmental support. The British High Commission does not benefit from this same degree of customization due to the dense urban environment and the age of
the building. Their approach to security was to adopt subtle hardening measures to maintain a secure building that blends into the surrounding urban fabric.

The following presents the summary charts from the findings of the analysis:

### CHART OF ANTI-TERRORISM CONCEPTS

<table>
<thead>
<tr>
<th></th>
<th>Deter</th>
<th>Detect</th>
<th>Deny</th>
<th>Devalue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Embassy</strong></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td><strong>British High Commission</strong></td>
<td>●</td>
<td>●</td>
<td>●/○</td>
<td>○</td>
</tr>
</tbody>
</table>

### CHART OF CPTED PLANNING PRINCIPLES

<table>
<thead>
<tr>
<th></th>
<th>Target Hardening</th>
<th>Access Control</th>
<th>Environmental Support</th>
<th>Real/Symbolic Boundaries</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Embassy</strong></td>
<td>●</td>
<td>●</td>
<td>●/○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>British High Commission</strong></td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### EVALUATION SCHEME

<table>
<thead>
<tr>
<th></th>
<th>Does not fulfill</th>
<th>Minimal fulfillment</th>
<th>Somewhat fulfills</th>
<th>Almost fulfill</th>
<th>Fulfills criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Embassy</td>
<td>●</td>
<td>●</td>
<td>●/○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>British High Commission</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Observation of these charts indicates that the British High Commission best-incorporated Security and CPTED. The BHC was chosen as the best example of an urban embassy due to its compliance with all criteria. While the US embassy complies with many criteria, the BHC appears to be better at incorporating the criteria and respecting the urban environment. The building itself is very secure, as noted by the anti-vehicular characteristics as well and the physical security measures – but it also aims to use CPTED principles that assure a safe and accessible streetscape for pedestrians as well. This is demonstrated through the attempts to eliminate blank walls, enhance street surveillance and to provide natural barriers from traffic. The promise of assuring pedestrian safety is complemented by the presence of the more understated security features – making sure that the nature of the building and potential threats are masked to the general public. This combination of security and CPTED is thus a best practice in urban security and embassy planning, and should, in turn, be considered for the planning of new urban embassies in similar contexts as well as the renovations of existing buildings for embassy use.

5.3 Recommendations
Based on this conclusion, the following sections will outline recommendations and the corresponding explanation for both embassies. A table of specific recommendations based on the study criteria and findings of the analysis section have been proposed in each chapter. Most of these recommendations are specific to the explicit CPTED or anti-terrorism categories as explained in the methods section.

5.3.1 Recommendations for the US Embassy
The following outlines general recommendations for the US Embassy and surrounding area:
• **Extend the security features of the bicycle lanes east and west fronting on Mackenzie Ave.**

    The addition of target hardening using bollards to create a dedicated bicycle along the length of the building facing onto Mackenzie Ave. is recognized as an efficient use of CPTED. It is thus recommended that the separated bicycle lanes be extended to each end of Mackenzie Ave. to Sussex Blvd. and Rideau St. The extension of a protected, dedicated bicycle lane would not only benefit and promote more cycling but, it would also de-emphasize the front façade of the building by helping homogenize the streetscape from the obvious security measure in front of the US Embassy. The posts that delimit a separated bike lane need not be as massive as the bollards in front of the embassy. The extension of the posts separating the lane would ultimately contribute to the devaluing of the site, the establishment of better environmental support, as well as contribute to the City of Ottawa’s cycling program.

• **Create a more uniform and more unobtrusive street frontage, without sacrificing security features.**

    As stated, Mackenzie Ave. was identified as having a façade that clashes with the surrounding streetscape. The Sussex Dr. entrance also boasts similar qualities. Better adjacent conditions could be created by a more uniform and understated street frontage, through the re-design of unnecessary high fences and the addition of natural or subtle target hardening, similar to the reinforced street furniture, planters and stairs employed by the British High Commission. These actions would consequently affect the urban design at the public and pedestrian realm to help the otherwise imposing structure blend
into the surrounding urban environment at street-level through more useful and aesthetically pleasing planning and urban design elements.

• **Revisit the use of visible security and surveillance features**

The presence of conspicuously visible security features in the area was a noteworthy overarching theme. As discussed in the analysis, prominent visible security features like oversized CCTV cameras and visible security officers are employed by the US Embassy for visual reinforcement. However, future additions to changing security need to be better integrated into the building and urban fabric. Elements such as the use of the traffic wiggle on York St. are examples of more elegant security features that can be integrated to increase security and offer the least visual obstructions possible. These design improvements would attract more positive attention to the building and help it maintain adequate surveillance secretly, to keep the heritage, tourist and pedestrian characteristics of the urban environment thriving.

Figure 5.1: Traffic wiggle at York St and Sussex Ave.
### Table 5.1: Specific Recommendations for the US Embassy

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deter</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Detect</td>
<td>Revisit the use of highly visible security features.</td>
</tr>
<tr>
<td>Deny</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Devalue</td>
<td>- Create a more uniform and unobtrusive building.</td>
</tr>
<tr>
<td></td>
<td>- Revisit the use of visible security features.</td>
</tr>
<tr>
<td></td>
<td>- Extend the bicycle lanes</td>
</tr>
<tr>
<td></td>
<td>- Work at creating a building environment that blends in with the surrounding urban fabric.</td>
</tr>
<tr>
<td>Target Hardening</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Access Control</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Real/Symbolic Boundaries</td>
<td>Work to create more of a symbolic boundary – utilize the natural as well as built elements to their advantage</td>
</tr>
<tr>
<td>Environmental Support</td>
<td>Adapt the building’s façade and entrances to further support the public realm</td>
</tr>
<tr>
<td>Surveillance</td>
<td>Recommendation to revisit future use of visible surveillance measures</td>
</tr>
</tbody>
</table>
5.3.2 Recommendations for the British High Commission

The following text outlines general recommendations for the British High Commission and surrounding area:

• **Work on reinforcing the sides of the building in a similar fashion to its front.**

The building used subtle and more natural target hardening to reinforce its façade. This objective is through the addition of stairs and marble planters along the front entrance of the building. The use of these features, along with the natural ‘fence’ from the trees provide substantial protection against vehicular attacks. However, similar security is lacking on the north and south sides of the building. Currently, only the Jersey barriers and a fence protect the parking lot. By adding reinforcement similar to the marble planters in place of the barriers, the corners and sides would benefit from more protection and an increased environmental support and access control. With the arrival of the Confederation line of the LRT in 2018, the transit traffic on Queen Street will be dramatically reduced.

This creates an opportunity for the BHC to work with the City of Ottawa on the street redesign to form a more aesthetically pleasing and secure boundary on the perimeter of the building, a design that would be synonymous with the adapted character of the streetscape.

• **Take advantage of the surrou**

Figure 5.2: Current South side of the British High Commission in Fall 2016
As stated in the analysis portion of this report, the advantage the US Embassy has over the BHC is the fact that the building is much newer and on a larger lot, thus yielding more opportunities for customization of security features. By taking advantage of the surrounding urban environment, the BHC could potentially produce the same level of security adopted by the US Embassy. This can be implemented in the following ways:

- **Establish more of a building boundary without attracting too much attention.**

  This recommendation is based on the previous one; however, it refers to the extension of building boundaries to provide more security. Nevertheless, this extension needs to follow the precedents already set by the building – that is being subtle yet functional. This can be added through various methods like the ones explained earlier – such as the traffic chicane, the addition of planters to further create a boundary on the perimeter of the building and the creation of more strategic views for surveillance and security personnel. Another way this can be implemented is through the adoption of dedicated bicycle lanes along the sides of the building – thus creating an extra layer of security and a new boundary.
Table 5.2: Specific Recommendations for the BHC:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deter</td>
<td>Reinforce the sides of the building to establish a clearer boundary.</td>
</tr>
<tr>
<td>Detect</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Deny</td>
<td>Establish a larger security network along the building</td>
</tr>
<tr>
<td>Devalue</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Target Hardening</td>
<td>Implement more natural target hardening features along the perimeter of the building</td>
</tr>
<tr>
<td>Access Control</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Real/Symbolic Boundaries</td>
<td>Work to create more of a real boundary – utilize the natural as well as built elements</td>
</tr>
<tr>
<td>Environmental Support</td>
<td>No recommendation</td>
</tr>
<tr>
<td>Surveillance</td>
<td>No recommendation</td>
</tr>
</tbody>
</table>

5.4 Limitations and Opportunities for Future Research

The methods and evaluation criteria used were limited in range due to the constraints and specific checklist of features, especially within target hardening and the FEMA guidelines. On the other hand, certain criteria also boasted very subjective and
loose definitions, notably symbolic boundaries. Looking back, a set of more concrete but open-ended criteria might have been used for a more or less objective base of analysis. Furthermore, an adaptation of both the anti-terrorism and CPTED criteria would be useful as some of the specific characteristics tend to repeat themselves, for example, a consolidation of ‘deny’ and ‘target hardening’ would have been more concise and less repetitive, as they tended to overlap. All and all the method did not limit the research, but could be consolidated and clarified for future uses.

The scope of this research was limited due to the document length and time constraints associated with the requirements for reports from the School or Urban and Regional Planning. The scope of the work was therefore limited solely to the relationships of two embassies in Canada’s capital to limit the subject and page count. Further research on the topic could widen the scope to similar international case studies, or to states suffering political crisis such as the Middle-East. The limitation of the scope also only considered the built form of the building, a further analysis of the social aspects of the building or the interior of the buildings were overlooked and would provide for compelling future research.

Due to the highly classified and secure nature of the study, many security elements were omitted due to the limited information accessible to the researcher. If the information were to be published, it might be helpful to extend the audit to include an examination of these characteristics. On this note, due to the scope and likeliness of events, the researcher chose to focus on threats specifically to personal and vehicular attacks to the building and sidewalks rather than focusing on airborne attacks or attacks on the plaza. Further research into these specific security measures would be of some interest to
planners and should be pursued. Furthermore, other embassies in capital cities could be studied, especially cities like Berlin where many new embassies have been built in a similar time period.

5.5 Conclusion of Report

From this study, we learned that planning and urban design may play a significant role in crime prevention, security measures and critical anti-terror design in community planning. This is becoming increasingly important in a post-9/11 world, as planning and design professionals make decisions surrounding public safety and security of high-risk buildings, it is imperative that the decisions take into account the effect on the surrounding urban environment. Proper planning of these sites would take into account both CPTED and the four “D’s” of anti-terrorism design, but would also take into consideration the opportunities to create beautiful, useful and safe urban spaces. As planners, we should consider the growing need for security of the major pedestrian-focused areas with political undertones. The design of the embassies were shaped by political undercurrents, which can be observed in the design of the buildings and the projected image of each foreign mission. This political message is manifested through the statement conveyed by the security and hardening features included in each building. The image projected by the US Embassy is much more ‘powerful’, ‘threatening’ and ‘imposing’ than its counterpart, suggesting that the US architecture was trying to make a political statement at the
time. On the other hand, the British High Commission’s building has a much softer and subdued outside, suggesting a less imposing political statement. By focusing on the unique safety concerns of these areas and implementing efficient urban and community design, the area can be hardened, surveyed and still respect the urban realm. This research project thus highlights this significance and promotes the need to integrate security and CPTED seamlessly, within the urban context, paying special attention to the use of adjacent streets. Finally, the outcomes of this research could potentially provide additional support for security planning trends to promote a new understanding of the relationship between environment and security.
REFERENCES


the Post-9/11 City. Boston, MA: Massachusetts Institute of Technology, Master’s Thesis.


### Appendix A: Blank Evaluation Sheet

#### FEMA’s Anti-Terrorism Strategies at the Scale of the Site

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Does it Fulfill?</th>
<th>How?</th>
<th>CPTED Principle</th>
<th>Method</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US EMBASSY and BRITISH HIGH COMMISSION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Deter**  
*Terrorists from targeting the area through its looks* | | | Target Hardening | - Research into the security methods used in this and other embassies. | Atlas (2013) pp.147-168  
Boddy (2007)  
FEMA 426 (2003)  
FEMA 430 (2007)  
Loeffler (2011)  
Rothock (2010) |
| Deter  
*Terrorists from targeting the area through its looks* | Does it have: fences, bollards, perimeter security, signage, access points? | Target Hardening | - Research into the security methods used in this and other embassies. | Atlas (2013) pp.147-168  
Boddy (2007)  
FEMA 426 (2003)  
FEMA 430 (2007)  
Loeffler (2011)  
Rothock (2010) |
| **Detect**  
*Potential Threats, and monitor* | Are there: CCTV, control points, access points, controlled parking, security personnel, surveillance methods, public spaces, open spaces? | Access control Surveillance | - Visual survey and inventory | |
| **Deny**  
*Minimize or delay damage or loss of life* | Does it have: Fences, bollards, blast-proof wall behind reinforced glass, multiple entrances, reinforced construction materials, hidden security measures? | Access control Target Hardening | - Visual survey  
- Document analysis  
- Comparative analysis to other deterring elements of high-risk buildings | |
| **Devalue**  
*Making the building little value or consequence.* | Is the building very prominent and a very visible target? Is it compatible with its surroundings? | Environment Activity support | - Visual survey  
- Comparative analysis | |
## INDICATORS AND ELEMENTS OF CPTED AND SECURITY PLANNING

<table>
<thead>
<tr>
<th>Criteria</th>
<th>CPTED Purpose</th>
<th>Anti-Terrorism Purpose</th>
<th>Tools / Implementation</th>
<th>Methods</th>
<th>Sources</th>
</tr>
</thead>
</table>
| **Target Hardening**| Identifying a hierarchy of power and visual permeability dependent, reinforcement for the building, visible defense. | Provides a visible barrier that allows for easy monitoring of the area, stopping any loss of life or damage to the building. | Fences, bollards, reinforced security measures, Blast proof glass, jersey barriers, access control, security personnel, security booths, natural target hardening (such as plants) | - Literature review of CPTED principles and national security policies and trends.  
- Document review of relevant City of Ottawa, NCC and federal guidelines and plans  
- Direct Observation of area and design features of the area based on CPTED and literature.  
- Photographs to supplement the direct observation  
- Comparison of implementation with other case study.  
- Research into the security methods used | Atlas (2013) pp.147-168  
CBC (2006)  
Coaffe (2009)  
FEMA 426 (2003)  
FEMA 430 (2007)  
Jacobs (1961)  
Loeffler (2011) pp.247-252  
Metro (2016)  
RCMP (2016)  
Rothock (2010) |
| **Access Control**  | Limiting the opportunity for crime by delineating space, creating a barrier between the terrorist and the building itself. Using structure to divert and control others. | Increases the standoff distance between the danger and the building, allowing a secure entrance and screening facilities. | Control booths, security personnel, access control, limited entrances, fences, check points, secure perimeter, monitoring of parking. | - Research into the security methods used | |
| **Environmental Support** | A design that takes into account its enhancements setback and limits and hardened natural features (trees), | | | | |


surroundings, such as limiting the use of the building for conflicting uses and maintenance of ‘eyes on the street’, increasing surveillance opportunities.

Identifies acceptable and suspicious behavior in the ears. Promotes a sense of security and the implementation of security through landscape design.

Windows, planters, benches and other hardened design features to blend into the surroundings.

in other embassies and government buildings.

<table>
<thead>
<tr>
<th>Real/Symbolic Boundaries</th>
<th>Identifying ownership of the space through real or symbolic boundaries. This creates both a physical and imagined barrier – taking away the opportunity for crime.</th>
<th>Provides an extra barrier and decreases the opportunity behind the crime. Creates a sense of safety, but also provides opportunities for surveillance.</th>
<th>Fences, delineation of public vs. private space, use of space, windows, signage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance</td>
<td>Maximizing the ability to spot suspicious people and activities (RCMP, 2016)</td>
<td>Provides a sense of security and a visual analysis and security of space</td>
<td>CCTV, windows, security booths, security personnel, open space.</td>
</tr>
</tbody>
</table>
## Site Audit Sheets
*Has been adapted from written form*

<table>
<thead>
<tr>
<th>CPTED Principle</th>
<th>US EMBASSY</th>
<th>BRITISH HIGH COMMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deter</strong></td>
<td><strong>Does it Fulfill?</strong> Does it have: fences, bollards, perimeter security, signage, access points</td>
<td><strong>Does it Fulfill?</strong> Does it have: fences, bollards, perimeter security, signage, access points</td>
</tr>
<tr>
<td>Terrorists from targeting the area through its looks</td>
<td><strong>CPTED Principle</strong> Target Hardening</td>
<td><strong>CPTED Principle</strong> Target Hardening</td>
</tr>
<tr>
<td><strong>Detect</strong></td>
<td><strong>How?</strong> Are there: CCTV (15+), control points, access points, controlled parking, security personnel, surveillance methods, public spaces, open spaces</td>
<td></td>
</tr>
<tr>
<td>Potential Threats, and monitor</td>
<td><strong>CPTED Principle</strong> Access control Surveillance</td>
<td></td>
</tr>
<tr>
<td><strong>Deny</strong></td>
<td><strong>How?</strong> Does it have: Fences, bollards, blast-proof wall behind reinforced glass, multiple entrances, reinforced construction materials, hidden security measures</td>
<td><strong>CPTED Principle</strong> Access control Target Hardening</td>
</tr>
<tr>
<td>Minimize or delay damage or loss of life</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Devalue</strong></td>
<td><strong>How?</strong> Is the building very prominent and a very visible target? Is it compatible with its surroundings?</td>
<td></td>
</tr>
<tr>
<td>Making the building little value or consequence.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Security, CPTED, and Capital Planning

<table>
<thead>
<tr>
<th>Deny</th>
<th>Target Hardening</th>
<th>Does it have:</th>
<th>Access control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimize or delay damage or loss of life</td>
<td><strong>Identifying a hierarchy of power and visual permeability dependent, reinforcement for the building, visible defense.</strong></td>
<td>Fences, bollards, blast-proof wall behind reinforced glass, multiple entrances, reinforced construction materials, hidden security measures</td>
<td><strong>Control booths, security personnel, access control, limited entrances, fences, check points, secure perimeter, monitoring of parking.</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Devalue</th>
<th>Access Control</th>
<th>Is the building very prominent and a very visible target</th>
<th>Environment Activity support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making the building little value or consequence.</td>
<td><strong>Limiting the opportunity for crime by delineating space, creating a barrier between the terrorist and the building itself. Using structure to divert and control others</strong></td>
<td><strong>Increases the standoff distance between the danger and the building, allowing a secure entrance and screening facilities.</strong></td>
<td><strong>Bollards, fences, hardened natural features (trees), windows,</strong></td>
</tr>
</tbody>
</table>

| Environmental Support | **A design that takes into account its surroundings, such** | **Enhances setback and limits and identifies** | **Bollards, fences, hardened natural features (trees), windows,** |

### US EMBASSY

<table>
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<tr>
<th>Criteria</th>
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<th>Anti-Terrorism Purpose</th>
<th>Tools / Implementation</th>
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<tbody>
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<td>Target Hardening</td>
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<td><strong>Fences, bollards, reinforced security measures, Blast proof glass, jersey barriers, access control, security personnel, security booths, natural target hardening (such as plants)</strong></td>
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| Access Control | **Limiting the opportunity for crime by delineating space, creating a barrier between the terrorist and the building itself. Using structure to divert and control others** | **Increases the standoff distance between the danger and the building, allowing a secure entrance and screening facilities.** | **Control booths, security personnel, access control, limited entrances, fences, check points, secure perimeter, monitoring of parking.** |

<p>| Environmental Support | <strong>A design that takes into account its surroundings, such</strong> | <strong>Enhances setback and limits and identifies</strong> | <strong>Bollards, fences, hardened natural features (trees), windows,</strong> |</p>
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</tr>
<tr>
<td><strong>Access Control</strong></td>
<td>Limiting the opportunity for crime by delineating space, creating a barrier between the risk and the building,</td>
<td>Increases the standoff distance between the danger and the building,</td>
<td>Control booths, security personnel, access control, limited entrances, fences, check points,</td>
</tr>
<tr>
<td><strong>Security, CPTED, and Capital Planning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Emilie Coyle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>terrorist and the building itself. Using structure to divert and control others</strong></td>
<td>allowing a secure entrance and screening facilities.</td>
<td>secure perimeter, monitoring of parking.</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental Support</strong></td>
<td>A design that takes into account its surroundings, such as limiting the use of the building for conflicting uses and maintenance of ‘eyes on the street’, increasing surveillance opportunities.</td>
<td>Enhances setback and limits and identifies acceptable and suspicious behavior in the ears. Promotes a sense of security and the implementation of security through landscape design.</td>
<td>Bollards, fences, hardened natural features (trees), windows, planters, benches and other hardened design features to blend into the surroundings.</td>
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