

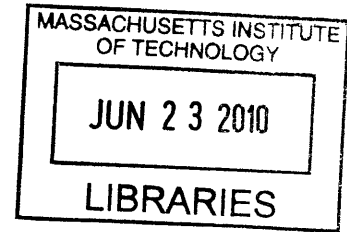
Antiterrorism Design and Public Safety:  
Reconciling CPTED with the Post-9/11 City

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ABSTRACT

Urban downtowns have changed since September 11<sup>th</sup>, 2001, sprouting bollards, planters, and barriers installed on the pretense of improved safety and security. While these interventions protect buildings from vehicle bombs, they have not been properly integrated into the fabric of the downtown, and they have not conformed to good urban design principles. This thesis explores the intersections of crime prevention through environmental design (CPTED), physical antiterrorism design (ATD), and principles guiding the design of public spaces. The thesis focuses on the processes whereby antiterrorism design interventions are sited in Boston and New York and examines current installations. Ultimately, the author argues for better integration of antiterrorism interventions with both CPTED and urban design principles, suggesting that public education and a London-like ‘ring of steel’ are the best ways to secure downtowns without compromising unique urban character.

First, the thesis provides an account of antiterrorism design history within the United States, and follows this with a description of how leading documents articulate antiterrorism design principles at different scales. Next, the evolution of place-based crime prevention strategies is explored, ending with a discussion of CPTED, and a description of this strategy at different scales. A comparison of ATD and CPTED principles reveals that there are few irresolvable discrepancies between the two design strategies. Pictures from downtown Boston and New York are provided throughout the thesis to illustrate ATD and CPTED ‘dos’ and ‘don’ts.’

In the second half of the thesis, ATD and CPTED policies of downtown Boston and New York are examined in pursuit of synergies and innovations in design processes. At multiple sites in these cities, ATD violates both CPTED and the principles of good urban design. According to theory discussed earlier in the thesis, these discrepancies are not obvious outcomes. Ultimately, the author argues that ATD should be optimized through the use of CPTED strategies and humanized through the use of civic design principles.

Thesis Supervisor: Susan Silberberg-Robinson

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## TABLE OF CONTENTS

INTRODUCTION.....	9
PART I.....	17
CHAPTER 1: ANTITERRORISM DESIGN HISTORY.....	19
CHAPTER 2: ANTITERRORISM DESIGN IN ACTION.....	27
CHAPTER 3: PLACE-BASED CRIME PREVENTION HISTORY...	39
CHAPTER 4: CPTED IN ACTION.....	47
EXHIBIT: ATD & CPTED SYNERGIES & DISCREPANCIES...	57
PART II.....	61
CHAPTER 5: BOSTON & NEW YORK ON LOCATION.....	63
CHAPTER 6: CIVIC DESIGN.....	79
CHAPTER 7: OPTIMIZING ANTITERRORISM DESIGN.....	85
BIBLIOGRAPHY...	97







## INTRODUCTION

*“Architecture is the will of an epoch translated into space.”*

*--Ludwig Mies van der Rohe*

The events of September 11, 2001 marked a paradigm shift in the long-held interests and policies of the United States of America. Suddenly, the outside world was perceived as a hostile place, and terrorists could leap from nowhere or anywhere and rain damage upon American cities and citizens. For the first time in over a century, the United States perceived itself as vulnerable. Furious and frightened, the nation lashed out.

The legacy of America’s reaction to September 11th is documented in wars, policies, and prisons. And, for those who can read the urban environment, the American reaction to 9/11 continues to manifest itself on the tableau of the city. Physical antiterrorism interventions dot downtowns and financial districts of most major urban areas (and even some minor ones). In fact, antiterrorism measures are now so numerous, pervasive, and routine that we rarely take notice. In the words of the authors of “The Terror City Hypothesis,”

A culture of intensified (yet routine and almost mundane) militarization now pervades daily life in America’s roster of world cities. In turn, the militarization of urban life helps to reinforce the widespread perception of a new urban vulnerability (Gray and Wyly 2007, 330).

Indeed, while Americans seem acutely aware of the vulnerabilities to terrorist attack, they also seem to have largely forgotten previous outrage over physical antiterrorism interventions.

Antiterrorism interventions take many shapes, including that of surveillance, altered vehicular and pedestrian pathways, and hardened building lobbies and perimeters. These last two, hardened lobbies and building perimeters, are perhaps the easiest to recognize (and the most difficult to avoid). Hardened perimeters feature bollards, barriers, and fences, while hardened lobbies feature metal detectors, turnstiles, and guards (with or without automatic weapons). While these interventions, known collectively as methods of ‘target hardening,’ are most closely associated with our post-9/11 world, many were conceived well before the events of that day.

Target hardening as a design resource and anti-crime strategy was made popular through a movement known as Crime Prevention Through Environmental Design (CPTED). CPTED endeavors to create design interventions that focus on crime opportunity reduction. Target hardening is a method of reducing the opportunity for crime through physically intimidating infrastructure. The idea harkens back to medieval architecture: build a fortress to show strength and frighten enemies.

Though target hardening emerged from CPTED, the early thinkers of the movement, Oscar Newman and C. Ray Jeffery, were quick to dismiss the concept as an incomplete solution. While target hardening creates a hostile environment for one's enemies, it also creates a hostile environment for daily users. Sometimes criminals even see target hardening as a challenge rather than a deterrent. Additionally, focusing solely on target hardening distracts from the opportunity to create other CPTED interventions. Without multiple approaches, CPTED fails to achieve the desired results of reducing crime through environmental design.

Often, counterterrorism design relies solely on target hardening. In a 2006 article on urban design and counterterrorism, author John Hockenberry interviewed landscape architect Len Hopper of the New York City Housing Authority (Hockenberry 2006). While speaking of target hardening, Hopper lamented the fear instilled by some antiterrorism interventions and asserted that designs need to incorporate basic CPTED principles. The holistic CPTED principles, he asserted, would be more successful at deterring terrorism than target hardening alone.

Hopper also addressed the issue of hostile spaces as created by target hardening. He stated, "You can increase security to a point where you actually instill fear, and then you have failed spaces" (Hockenberry 2006). Spaces fail when people are too frightened to linger or enjoy an area. This is particularly true in dense urban environments, where every iota of non-private or publicly appropriated outdoor space is valuable to city-dwellers. A hostile space will alienate urbanites, and, according to the "eyes on the street" theories of Jane Jacobs and Oscar Newman, the emptiness of these places will make them more susceptible to criminal activity. As such, the urban public realm begs for new answers for creating security in urban spaces. A new design paradigm is needed to address the possibility of terrorist attack and recognize the reality of day-to-day crime, while simultaneously supporting vibrant public spaces.

## **TENSIONS: THE SOCIAL CONTRACT VS. DEMOCRATIC ARCHITECTURE**

Before embarking on this discussion, however, we must first contemplate the unique dilemma posed by the threat of terrorist attack. The difficulty inherent in planning for and designing buildings and spaces in an American city post-9/11 is the tension between the need of the government to fulfill the social contract of citizen protection, and the need to allow for the traditional urbanism and social interaction within democratic societies. Social contract theory is the means by which humans have attempted to explain the origins of governments and political systems. Many philosophers have opined about the theory, and most have various conceptions of which type of social contract is most just or expedient. Social contract theory in a terror-charged nation necessarily conjures the work of Thomas Hobbes.

In *Leviathan*, Hobbes asserted that man without government is in a ‘state of nature.’ In a state of nature, everyone is entitled to everything, thus resources wars are continually being waged, and life is

## OURS...to fight for



## FREEDOM FROM FEAR

Figure 1. *Freedom From Fear*, by Norman Rockwell (1943). Source: Government Printing Office for the Office of War Information, retrieved from [www.archives.gov](http://www.archives.gov)

“nasty, brutish, and short.” However, by relinquishing some personal rights to a governmental entity, that entity agrees to offer protection, and civil society is born (Hobbes 1904, 84). By creating policies and procedures that interrupt urban life and promote target hardening, the American government is trying to fulfill its social contract with the American people. It is attempting to address what Franklin D. Roosevelt described as one of the four universal freedoms—freedom from fear (Roosevelt 1941).

It is also relevant here to mention what is arguably one of the most famous sound bites from yet another of President Roosevelt’s speeches: “the only thing we have to fear is fear itself” (Roosevelt, First Inaugural Address 1933). Though in this instance Roosevelt was referring to the Great Depression, he made a timeless observation, and one that is decidedly applicable to the studies of terrorism. Terrorism, at its root, is a tactic whereby its perpetrators seek to inspire fear, and thus exercise a degree of control over a

certain population. According to scholars of terrorism, terrorists do not necessarily seek to spill as much blood as possible. Terrorists seek to wield fear and uncertainty as weapons through which to achieve other goals. This psychological manipulation is quite effective. One need go no farther than Abraham Maslow’s Hierarchy of Needs to see that the need for safety is one of the needs upon which human fulfillment is predicated (Simons, Irwin and Drinnien 1987).

As a result of its interest in fulfilling the social contract and of citizens’ demand that it do so, the government has promoted target hardening and invasive security measures in the nation’s capital and in urban downtowns across the country. Through these measures (and others), the government is trying to protect the American people. While the motives may be as clear as protecting citizens from acts of terror, these physical design interventions, imposed in the name of safety, are changing the traditional meaning conveyed through urban design in American cities. In the words of one author,

The most publicized and cherished buildings, notably government or religious buildings, become significant symbols that remind everyone whose attention they command that they share a common heritage and a common future” (Edelman 1995, 75).

Indeed, it is the government and religious buildings that inform the public of the future and also offer solid reassurance of continuity with the past. With antiterrorism design guidelines and increasing target-hardening strategies, are our government buildings signifying that our future is stark and terrifying and that the assurance of our past can no longer be trusted? Antiterrorism design, when based upon target hardening, is negating the more traditional American downtown. This traditional design is predicated upon the notion that the downtown is the center of commerce and government. As such, it is required to be not only open but inviting, and easily navigable for citizens. Do we think that target hardened buildings create an inviting environment for consumers? Do we truly believe that target hardened buildings are reflective of a democratic political system?

Even more problematic, policies and guidelines that inform design decisions of public governmental buildings and land in urban areas also inform the design of those structures and spaces in the private realm. This is true on both formal and informal grounds. When private companies recognize security design in government buildings, they must feel compelled to believe that there is a threat. As a result, they will act in their best interest to preserve assets.

#### **TENSIONS: PUBLIC VS. PRIVATE**

At the onset of this project I saw all security decisions as issues of public safety. Now, however, I recognize that many security decisions (perhaps the majority) are made instead for *private* safety, or other reasons. With very few exceptions, the government does not compel private owners to make security changes or upgrades on their properties. Private buildings must only respond to building codes. Antiterrorism design guidelines released by the Federal Emergency Management Agency (FEMA), Interagency Security Committee (ISC), and National Capital Planning Commission (NCPC) are advisory in nature.

More often than not, it is the decisions of individual private entities that are changing the face of the city. Public intervention generally ends at the inside of the sidewalk, if not at the width of the street. In downtowns this public/private struggle is palpable. The public is given very specific clues regarding the level of privacy expected by certain sites. The trouble with antiterrorism interventions lies in the trend of converting semi-private/semi-public space into wholly private space, and public space into semi-private or wholly private space. This is particularly troubling in downtown areas, where quality of public space is just as important to citizens and consumers as government functions and shopping nodes.



The norm of public space in downtowns is built into the history of American cities. From colonial times Americans have planned cities around a central public open space, or commons. In the words of two historians,

The town center, represented by the square, was conceived as a setting for collective action. People went there to participate in public activities that were often political and carried communal meanings. The square at the core would serve as the generative space of the entire settlement, which was laid out from the center outward” (Loukaitou-Sideris and Banerjee 1998, 38).

As time went on, the town center, or common was flanked by government offices, though the allure of the open public spaces was increasingly eclipsed by the pull of the central business districts. Sometimes open public spaces managed to survive, though increasingly they were developed as lucrative real estate for the city (Loukaitou-Sideris and Banerjee 1998, 99). However, public space, while perhaps no longer manifest as a ‘green commons,’ has always been invaluable to successful downtowns. One need look no further than the commission of the work of William H. Whyte to justify this fact or the elaborate efforts to convert the above-ground parking garage in Post Office Square to a beautiful public park in Boston’s Financial District.

Urban downtowns have historically provided public space for residents and visitors. Urban success may even be predicated upon good public space. The urban planner and theorist Kevin Lynch asserted that people have five basic public space rights: presence, use and action, appropriation, modification, and disposition (Lynch, *A Theory of Good City Form* 1981). When antiterrorism design annexes crucial public space, or even alters it so that stakeholders may no longer have access to these ‘five basic rights,’ it negatively impacts the urban environment.

There must emerge a watchdog for post-9/11 public space. So far, it seems that MIT lecturer Susan Silberberg-Robinson and University of Colorado Denver professor Jeremy Németh are the best contenders. However, this job should extend beyond academics to the cities themselves.

Municipalities must endeavor to take control of ad-hoc private decision-making in order to restore semblance of design order to their urban environments. Only Washington, D.C. appears to have a grasp on an overarching physical security plan. The rest of the country seems to be interested in allowing security professionals to work much in the way of architects. However, there are crucial differences in the processes of architects and security specialists. While architects seem to come onto a site and think ‘how can I make this building be a beautiful structure that serves the occupants well and yet is compatible with the needs of the surrounding urban environment,’ it is rare to find a private security firm with the same mindset. Rogers Marvel, a NYC design firm specializing in physical antiterrorism interventions, departs from that notion. Rogers Marvel imparts a design philosophy predicated upon a deep understanding of American downtowns and a belief in the collaborative process between client, security

expert, and designer. The firm believes that all physical antiterrorism interventions should be simultaneously conceived of as public amenities. This beautiful and strategic thought is, sadly, an anomaly. However, it represents a model that is multilateral and invested in the principles of civic design, which will be discussed later in this thesis.

## **CIVIC DESIGN AND CPTED AS MEANS TO HUMANIZE ANTITERRORISM DESIGN**

It is clear from a scan of our urban environments that not all security and design professionals share the values of firms like Rogers Marvel. As such, there needs to be a new way to conceive of the antiterrorism design process. It must be reconceived in a manner that is sensitive to downtown urban environments, and in such a way that the most important goals of antiterrorism design and public space design are compatible. This thesis pursues the belief that the solution to reconciling antiterrorism concerns and public space advocacy can be found in CPTED.

CPTED as a process has deep roots in the law enforcement community, and as such, will be relatively simple to present as a solution to an otherwise hard-to-convince constituency. 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. CPTED attempts to diminish instances of day-to-day crime.

An examination of CPTED and its goal of crime prevention are especially strategic in light of the seemingly crime-producing environments of some antiterrorism design. Antiterrorism design, as described earlier as well as throughout this thesis, often creates a hostile environment for daily users by scarring downtowns with desolate security zones, repetitive rows of bollards, and threatening architecture. As a result, it is possible that the interventions designed to keep people safe (from terrorists) are putting people in danger of increased day-to-day crime. In order to counteract this unpredicted outcome, as well as discourage inhuman architecture and site design, I propose that CPTED should be fully integrated with antiterrorism design principles in a holistic approach to safety, security, and Civic Design. This thesis examines how, why, and where there are conflicts between Antiterrorism Design and CPTED. Additionally, it relies on the premise that Civic Design as well as public policing of spaces (“eyes on the street”) is imperative for safe and secure places. Ultimately, this thesis explores the reconciliation of CPTED and Antiterrorism Design and proposes new processes and policies to oversee this reconciliation and the implementation that follows.

Part I of this thesis looks at the history of Antiterrorism Design and Crime Prevention Design strategies and how they are supposed to be implemented. Specifically, Chapters 1 and 2 of this thesis will familiarize the reader with the history of Antiterrorism Design (ATD) and then describe the principles of

ATD as they theoretically play out in reality. Chapters 3 and 4 review the history of place-based crime prevention strategies and then explain CPTED strategies for the downtown urban environment. An interlude after Part I spells out the exact areas of conflict between ATD and CPTED.

Part II of the thesis explores how ATD and CPTED play out in Boston and New York City, and offers recommendations framed around Civic Design principles. Specifically, Chapter 5 reviews the ATD and CPTED conditions in Boston and New York. Chapter 6 introduces Civic Design principles, and Chapter 7 provides recommendations and concludes the thesis.

The Twentieth Century architect Mies van der Rohe once stated, “Architecture is the will of an epoch translated into space.” I would take it one step further and contend that *urban design* is the will of an epoch translated into space. Is the will of this epoch to alter our urban environments solely to adapt to the aims of the terrorist? Or, instead, should American antiterrorism design strive to be representative of more democratic design, and one that endeavors to keep people safe from all crime? This thesis encourages further thought and offers some solutions on the future of security, crime prevention, and urban design.



PART I  
HISTORY AND PRINCIPLE.



## CHAPTER 1 ANTITERRORISM DESIGN HISTORY

This chapter will explore the origins and motivations of Antiterrorism Design (ATD) in the United States. It was not until relatively recently that terrorism was deemed a serious enough condition to merit research; as such, early design decisions were nearly universally created in reaction to terrorist events abroad. This chapter will provide background on antiterrorism design history, through to the most current ATD documents, published in 2009.

### INTRODUCTION TO TERRORISM

Before embarking on a discussion of antiterrorism design United States, it is worth defining ‘terrorism.’ According to Title 22 of the United States Code, section 2656f(d),

The term ‘terrorism’ means premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience (Office of the Law Revision Counsel, U.S. House of Representatives 2009).

This definition rightly distinguishes between senseless acts of violence and acts of terrorism. For example, the horrific shootings at Columbine and Virginia Tech were not instances of terrorism. Serial killers are not terrorists. Terrorists are people or groups that practice terrorism—politically motivated violence intended to influence an audience. However, this is only one working definition. There are many definitions for terrorism, and many advocates deny that it can even be defined. Instead, some choose to think about terrorism as occupying ambiguous space within several pre-established dimensions (Smelser and Mitchell 2002, 16). Still other theorists define terrorism first and foremost as a crime against the state, and terrorists as criminals.<sup>1</sup>

Other related, often misused words are ‘counterterrorism’ and ‘antiterrorism.’ In the international community these terms are used interchangeably. Within the United States, however, the two have distinct meanings. “Counterterrorism” involves collecting information and launching offensive missions to preempt terrorist attacks. “Antiterrorism” involves defensive measures taken to defend against attacks (Stepanova 2003). To avoid confusion, this paper will exclusively employ the term ‘antiterrorism’ when discussing design, since urban design is truly a defensive, and not offensive, mechanism.

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<sup>1</sup> This varies notably from politicians who wish to consider terrorism as an act of war. Some theorists argue that elevating terrorist attacks to acts of war serves to validate the terrorists as having enough status to be acknowledged as legitimate political players. Instead, these theorists argue that terrorists should be conceived of as heinous criminals, and punished as such.

## 'EARLY' ANTITERRORISM IN THE UNITED STATES

Modern antiterrorism design is predicated upon “Americans-abroad” militaristic roots which assume a preexisting hostile environment as a setting for its design interventions. Recognition of the faulty premise began with public discomfort voiced in newspapers over the altered urban environment following the 9/11 attacks, and has been reflected in more recent documents, like the Federal Emergency Management Agency’s 2007 guidelines for site design. However, these more recent documents seem more like band-aids than guidelines, as will be explored later in this thesis.

The history of terrorism, counterterrorism, and antiterrorism in America begins in the early twentieth century. Antiterrorism *design* in America, however, has much shallower roots. The concept of having a design strategy to combat terrorism did not truly begin until after international embassy bombings in the 1980s (Federal Emergency Management Agency 2007). One particularly heinous attack took place at the U.S. embassy in Beirut, Lebanon, when a suicide bomber drove a delivery truck filled with explosives into the building’s lobby, killing sixty-three people (Naftali 2005, 129). As a result, perimeter protection and access control for buildings were viewed as emerging standards for security at high-risk buildings. The attacks also inspired government officials to surround the White House with vehicles and planter-barriers in order to create greater protective setback distance between public roads and the building. Critics derisively referred to the barriers as “Reagan’s flower pots” (Naftali 2005).

It was during this time of increased awareness of terrorist risks that certain terms originated and goals were articulated. Progressive collapse, glass breakage, and protective setback and perimeter security were terms that were defined and explored. Threat assessments for building vulnerabilities were conducted “to determine the extent and type of potential structural and facade damage as a result of blast-induced loadings, as well as to estimate the likelihood of loss and the extent of injury to people and other assets, and to explore hazard mitigation options such as possible site, structural, and facade upgrades/enhancements (if needed) that will provide mitigation for meeting the project-specific ISC Security Design Criteria requirements” (U.S. General Services Administration 2009).

Even though these terms and ideas became standard for military planners who had to react to Lebanese bombing, they were not the domain of domestic design professionals until the 1995 Alfred P. Murrah Courthouse attack, more widely known as the Oklahoma City bombing. The Oklahoma City Bombing was significant for a number of reasons. First, it was the second terrorist attack on U.S. soil in two years.<sup>2</sup> Second, both terrorist acts had been perpetrated via bombs placed in rented vehicles (a van and a truck). Third, the Oklahoma City Bombing killed one hundred sixty-eight people: far more people

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<sup>2</sup> The first attack on New York City’s World Trade Center had occurred two years prior, in 1993. Six people died, a thousand suffered injuries mostly due to smoke inhalation, and the WTC was left with \$300 million in property damages (Anti-Defamation League 2005).



than had ever been murdered in a U.S. terrorist attack in the past<sup>3</sup>. Fourth, and finally, these civilian deaths (though perhaps not injuries) could have been prevented in both cases by employing some of the defensive perimeter strategies or access control procedures that the U.S. had been using overseas for the previous ten years.

The day after the bombing, President William J. Clinton tasked the Department of Justice with assessing whether other federal buildings were similarly vulnerable to terrorist attacks. Additionally, he called for preliminary ideas as to how to better secure existing buildings. The Department of Justice answered the call by creating two committees: the Standards Committee and the Profile Committee. The first committee “proposed minimum standards pertaining to secure perimeter buffer zones; the security of entrances and exits and related access procedures; the identification and admittance of employees and visitors; garage and vehicle service entrances; the location of day care centers; and the use of closed-circuit television monitoring.” The Profile Committee published a *Vulnerability Assessment of Federal Facilities* in June of that year (Smith 2007).

Four months after the *Vulnerability Assessment* was published, President Clinton issued executive order 12977, which ordered the creation of the Interagency Security Committee (ISC). The ISC was charged with establishing “policies for security in and protection of Federal facilities,” developing strategy for “ensuring compliance with such standards,” and “developing long-term construction standards for those locations with threat levels or missions that require blast resistant structures or other specialized security requirements” (Clinton 1995).

Soon after the creation of the ISC, the National Academy Press (the Press created to publish works by the National Academy of Sciences, the National Research Council, and others) produced a work, called *Protecting Buildings from Bomb Blast*. The document originated as a study commissioned by the Defense Nuclear Agency meant to aid in a discussion regarding whether “design methodologies and construction techniques developed for the protection of military facilities could be beneficially applied to civilian architecture” (Committee on Feasibility of Applying Blast-Mitigating Technologies and Design Methodologies from Military Facilities to Civilian Buildings 1995). The work asserted that the United States is vulnerable to terrorist bombing and that it is possible to reduce bomb impact through certain design retrofits. The document provided some early guidelines for locating high risk commercial buildings, which included recommendations that “Preferably, the site, its entrances, and the building itself should all be placed out of alignment with potential high-speed approaches by vehicles” (Protecting Buildings from Bomb Blast 1995). Vulnerable functions are suggested to be removed from ‘uncontrolled public traffic,’ and underground parking is discouraged altogether. There are also many structural

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<sup>3</sup> Past terrorist attacks on the United States involved few deaths, with the exception of the 1920 attack on New York City’s Wall Street that killed thirty-one people (Naftali 2005).

engineering suggestions. At the same time, concerns regarding too much visible security are acknowledged:

One consideration in commercial structures is that hardening features may be quite apparent when installed after the fact in an existing building, and most commercial building occupants do not want the appearance or the function of the building to be changed or to advertise their presence, if they are potential targets, by obvious security measures (Committee on Feasibility of Applying Blast-Mitigating Technologies and Design Methodologies from Military Facilities to Civilian Buildings 1995, 55).

While the authors aptly articulated these concerns, they were never addressed in the report. Nor were readers directed to another document, as they were for additional structural questions. Frequently mentioned were U.S. Army Technical Manual TM 5-853 and USACE's *Structural Design for Physical Security* (1995).

Perhaps most notably, the document recognizes that there are scant economic incentives for retrofitting a building against terrorist attack. The authors note,

Since every element in the development of an investment-grade property must pass a rigorous cost/benefit analysis to ensure that the added element does not dilute the anticipated return on investment, the decision to add a nonrevenue element, such as blast-resistant construction, to a building would be much more likely if there were some cost-recovery mechanism available. Some of these mechanisms could be tax credits, reduced insurance costs, or more favorable lender terms. However, none of these mechanisms are available today, nor are they being contemplated. The most attractive and likely incentive for including blast protection in an investment property would be finding a long-term tenant, such as a government agency, that is sensitive to security issues and is willing to pay a higher rent for a blast-hardened building (Committee on Feasibility of Applying Blast-Mitigating Technologies and Design Methodologies from Military Facilities to Civilian Buildings 1995, 67).

While this acknowledgement was astute, the solution (securing a government agency as a tenant) is not effective for most commercial buildings. Indeed, this solution is located in a section that is supposed to address the specific needs of commercial buildings.

As can be expected from these statements, it was difficult to get private buildings and agencies to conform to security guidelines. Mandating changes on public sites, though, was comparatively simple. By 1997 the ISC had created *Draft Security Criteria for the General Services Administration (GSA)* to guide the construction and site design of public buildings (U.S. General Services Administration 2010). The ISC continued to meet in working groups, ultimately producing a document called *Security Design Criteria for New Federal Buildings and Major Modernization Projects* in May 2001. These works are particularly important, as they signify the first time that security design was recommended for buildings other than Department of Defense facilities. Before these were released, "security was generally an afterthought: the last item added and the first item cut from any typical project" (U.S. General Services

Administration 2010). Four months after the ISC and GSA publication, the United States experienced the most horrific terrorist attack in its history.

SEPTEMBER 11, 2001

The events of September 11, 2001 reconfirmed the reality of terrorist attacks on American soil and put into motion a series of actions and reactions. Panicked building owners rushed to respond to the attacks in the most immediate ways possible. Armed with quick-fix interventions like jersey barriers and only the military-inspired GSA standards as guides, urban downtowns became militarized, concrete mazes.

Recognizing the desire of building owners for more accessible standards and greater guidance for permanent installations, the Federal Emergency Management Agency (FEMA) responded with FEMA 426, otherwise known as “A Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings” (Federal Emergency Management Agency 2003). The goal of the document was to create awareness and guidelines that would lead to a reduction in building and perimeter damage and minimize the possibility of casualties should there be future terrorist attacks. As part of the work, FEMA 426 briefly considered cost in relation to potential benefit, seeking to convey that risk management choices are economic trade-offs:

Do Nothing → No cost, greatest risk  
Install Reasonable Mitigation measures → Some Cost, Reduced Risk  
Harden Building → Greatest Cost, Lowest Risk (Federal Emergency Management Agency 2003, 1-44)

FEMA 426 provides multiple extensive checklists designed to engage managers in active analysis of their buildings, and to help identify potential areas of security improvement. Notably, FEMA 426 devotes section 2.12 to a discussion of incorporating CPTED into site design. In fact, CPTED principles are built into the remainder of the document, even though they are not explicitly identified as such. The report claims, “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). The section goes on to assert that CPTED principles are important to understand because utilizing only a ‘hardening’ approach (as discouraged in most CPTED literature) can, in fact, lead to a counterproductive security environment. Most importantly, however, FEMA 426 designated the “four Ds” of Antiterrorism Design:

- **Deter**: The process of making the target inaccessible or difficult to defeat with the weapon or tactic selected. It is usually accomplished at the site perimeter using highly visible electronic security systems, fencing, barriers, lighting and security personnel; and in the building by securing access with locks and electronic monitoring devices.
- **Detect**: The process of using intelligence sharing and security services response to monitor and identify the threat before it penetrates the site perimeter or building access points.
- **Deny**: The process of minimizing or delaying the degree of site or building infrastructure damage or loss of life or protecting assets by designing or using infrastructure and equipment designed to withstand blast and chemical, biological, or radiological effects.
- **Devalue**: The process of making the site or building of little to no value or consequence, from the terrorists' perspective, such that an attack on the facility would not yield their desired result (Federal Emergency Management Agency 2003, 1-9).

The Four Ds of Antiterrorism  
Design:

- DETER
- DETECT
- DENY
- DEVALUE

All four of these strategies have distinct design repercussions.

The Department of Homeland Security, though created by presidential directive on October 29, 2001, did not truly begin to issue physical design standards until 2003. By this time it had absorbed the ISC. In early 2003, a plethora of 9/11 studies emerged, many attempting to model risk, targeting preferences, and costs and benefits of security interventions. The ISC re-released its *Security Design Criteria for New Federal Office Buildings* document with an updated review and commentary (Interagency Security Committee 2003). The *National Strategy for The Physical Protection of Critical Infrastructures and Key Assets* of February 2003 was a response to Homeland Security Directive 7, which sought to mandate Critical Infrastructure Identification, Prioritization, and Protection. Most notably, it shifted the dialogue from a discussion of 'national security' (conceived as the responsibility of the government) to a discussion of 'homeland security' (conceived of as a more civic and collaborative process of public and private actors) (Department of Homeland Security 2003).

Between 2001 and 2005 the National Capital Planning Commission (the Federal Planning Agency for Washington, D.C.) released multiple documents and updates that created a comprehensive plan for the area. Most importantly, the main document, the National Capital Urban Design and Security Plan, had a centralized goal of creating best practices for designing for security that do not compromise the appearance of the built environment. NCPC's security website states that

hastily conceived security measures mar the city's beauty and obstruct access to public streets and spaces. They also contribute to a climate of fear. NCPC helps minimize the impact of security measures on public accessibility, aesthetic quality, and freedom of movement throughout the city (National Capital Planning Commission 2010).

While this was not the first time these sentiments were articulated, it was the first time they were comprehensively addressed. The first security plan was published in 2002 and updated in 2004 and 2005. NCPC also released a document called “Designing and Testing Perimeter Security Elements” in 2005. It is clear that for the NCPC site design was a priority, and that the interface of the urban environment with the public was not only important, but critically vital.

One clear impact of the NCPC was the FEMA 430 document entitled *Site and Urban Design for Security: Guidance Against Potential Terrorist Attacks*. FEMA 430 echoed a design philosophy that was also strongly influenced by the work of the New York City firm Rogers Marvel. In the document’s preface it states in no uncertain terms that “the designer’s role is to ensure that public amenity and the aesthetics of site surroundings are kept in balance with security needs” (Federal Emergency Management Agency 2007, iii). FEMA 430 was interested in aiding owners in establishing their building’s estimated level of risk, so as to minimize invasive design elements. It also established undesirable design interventions, as first described in the NCPC works. For example,

Monotonous repetition of a single element should be avoided. Block after block of the same element, no matter how attractive, does not create good design. When a continuous line of bollards approaches 100 feet, they should be interspersed with other streetscape elements, such as hardened benches, planters, or trees (Federal Emergency Management Agency 2007, 132).

FEMA 430 also made it very clear that, while codes are only mandatory for government structures, it was also a document amenable to and useful for private buildings as well.

Since the publication of FEMA 430, FEMA has continued to issue design-related guidelines. The ISC, too, has continued to update and improve codes. As of 2007, the ISC was working on updating the *Vulnerability Assessment*, and to create better security policies through multi-party consensus. According to one congressional report, “Through greater accountability and oversight, the ISC hopes to provide one leadership voice to integrate physical security initiatives successfully for the federal government” (Smith 2007, 6). The Department of Homeland Security has also issued a number of reports in recent years, including a 2008 report on *Facility Security Levels Determinations* regarding the process of determining the risk level of a federal facility, a 2009 report on *Use of Physical Security Performance Measures*, which requires agencies to assess effectiveness of their physical security programs, and a 2010 document on *Physical Security Criteria for Federal Facilities* that establishes a baseline set of physical security measures for all federal facilities (Department of Homeland Security 2010).

Independent cities and regions have come out with their own security guidelines in recent years. Some design work is undoubtedly funded by homeland security money, though it is difficult to ascertain what and how much. New York’s physical security plan, *Engineering Security*, will be discussed in a later section.

## CONCLUSIONS

As indicated by this chapter, modern antiterrorism design is predicated upon Americans-abroad militaristic roots which assumes a preexisting hostile environment as a setting for its 'four Ds.' The goals of antiterrorism design remain largely concerns about blast vulnerability, window vulnerability, progressive collapse, and perimeter security. While guidelines have recently become more sensitive to the public nature of urban environments, these realizations have yet to be fully integrated onto the grid of the city.

In the next chapter, the principles of Antiterrorism Design will be discussed as set forth in the documents discussed above. Antiterrorism Design strategies will be analyzed at the scale of the downtown, the scale of the street grid, the scale of the site, and the scale of the building. Then each scale strategies will be appraised through an analysis of the corresponding "Four Ds."

CHAPTER 2  
ANTITERRORISM DESIGN IN ACTION

As examined in the history of Antiterrorism Design, the American approach to physically defending against terrorist bombings is rooted in a militaristic approach. FEMA 426 concisely articulated the goals of Antiterrorism Design with four words:

- Deter**: The process of making the target (look) inaccessible or difficult to defeat
- Detect**: The process of using security services to monitor and identify the threat
- Deny**: The process of minimizing or delaying damage or loss of life or protecting assets by designing or using appropriately reinforced infrastructure
- Devalue**: The process of making the site or building of little to no value or consequence (Federal Emergency Management Agency 2003, 1-9).

The goals of deterring, detecting, denying, and devaluing can be achieved at different urban scales by employing different strategies. Since this thesis is particularly concerned with urban downtowns, only four scales will be analyzed: the scale of the downtown as a whole (the financial, commercial, and gubernatorial center of most cities, thus making it most prone to terrorist attack), the scale of the grid within the downtown (the streets and blocks within the downtown), the scale of the business campus or site (where one entity clearly defines territory), and the scale of a target building.

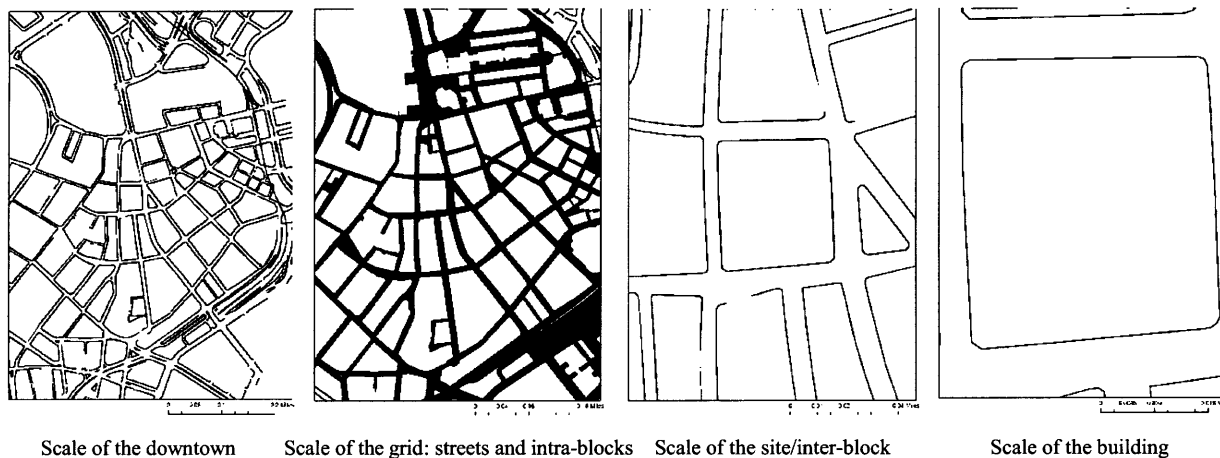


Figure 2. Scales of Downtown. These images indicate the corresponding scale of the intervention mentioned below. Created by author using ESRI's ArcMap and data layers provided by M.I.T.

The principles articulated above will be revisited as each scale is examined. This will provide an opportunity to understand how Antiterrorism Design strategies align with Antiterrorism Design goals.

## ANTITERRORISM DESIGN DOWNTOWN

While FEMA 430 has a section purporting to address Antiterrorism Design for downtowns, in reality, the section only addresses issues at a site scale. In truth, there is only one basic strategy that can be implemented over the entirety of an urban downtown: surveillance. Surveillance can come in a variety of forms.

The most extreme example of downtown surveillance is London's 'ring of steel.' In the summer of 1993, London was reeling from multiple attacks launched by the Irish Republican Army. The ring of steel was initially conceived as an intervention similar to police cordons used in Belfast. When the 'ring'

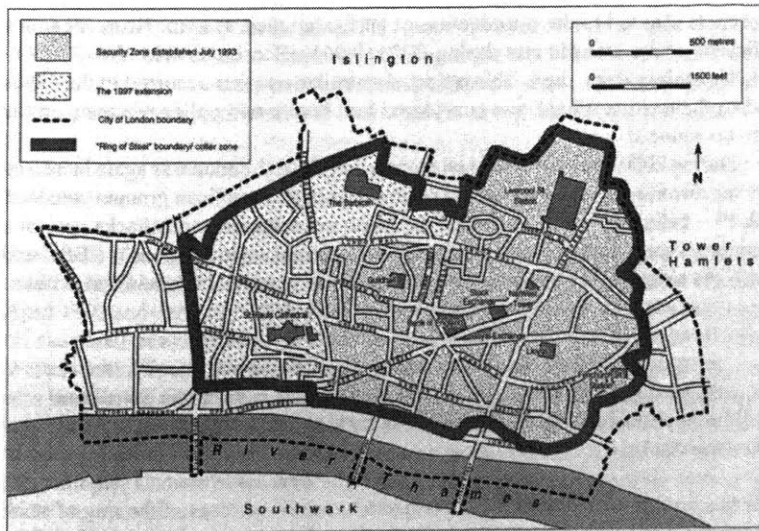


Figure 3. London's Ring of Steel in 1997. 'Ring' designated by thick black line. Dotted line represents the boundary of the City of London. Source: *Terrorism, Risk, and the Global City* by Jon Coaffee, p. 129 (2009).

was initially introduced to London's Square Mile, it sealed off entrances and exits to the city. Only seven entrances remained, and armed guards were stationed at each road check. Officially, the 'ring of steel' was called the 'Experimental Traffic Scheme,' and the project was marketed as an environmental and traffic congestion reduction strategy.

The security impact, however, was obvious. There was a separate ring maintained outside the ring of steel

known as the 'collar,' which received extra police attention as those businesses along the collar were concerned that terrorists would simply leave bombs just outside the ring. Later, the City stepped up surveillance with three different camera systems. The City Security Advisor stated that

CCTV has two implications related to the IRA. A principal aim of an IRA terrorist when carrying out an attack is not to get caught, therefore CCTV is a highly visible deterrent both when carrying out an attack and when planning one through surveillance...the key aim of CCTV in this respect was to alter the perception of risk for the IRA in the hope that they will go elsewhere and export the threat. The message CCTV gives is—yes you could get away with planting a bomb, as this is very difficult to stop, but you could well get caught on film which will be circulated all over the world including Ireland, and therefore you will always be looking over your shoulder (Coaffee 2009, 114).

Security cameras recorded every vehicle entering the Square Mile, and "by the end of 1993 there were more than seventy police controlled cameras covering the City" (Coaffee 2009, 115). Businesses were



encouraged to get their own cameras and join a city-wide program of footage-sharing called “Camera Watch.”

The London example of the ring of steel is an extreme instance of implementing surveillance for counterterrorism. More commonly, urban areas will increase police presence. Increasing the number of police in an area not only creates a display of force and vigilance, it also increases the number of aware individuals looking for unusual behavior. While a large, visible police force will prove intimidating for potential terrorists or other aggressors, it can also unintentionally frighten civilians away from downtowns. To civilians, large shows of force may seem to indicate that a place is likely to be unsafe (hence the need for the force in the first place). Common sense suggests that avoiding these places is the best option.

Also common is the creation of a Business Improvement District (BID), which enables an area to pool resources and invest in wayfinding systems<sup>1</sup>, seasonal events, maintenance, and security. BID security forces tend to be less threatening than city police forces. Citizens perceive BID security differently than police, and are more apt to find their presence helpful than intimidating.

The least discussed type of surveillance can come from urbanites themselves. Requesting an urban populace to be vigilant is effective enough that it is commonly employed in urban transportation centers. Pre-recorded messages in subways or on buses can beseech a captive audience to be aware of their surroundings and to report suspicious bags or behavior. Besides enlisting additional eyes to increase vigilance, these announcements are important instances (and sometimes the only ones) when individuals are alerted to the issue of ongoing threats.

Table 1. How ATD Strategies can be fulfilled at the scale of the Downtown.

<b>FEMA 426 Antiterrorism Strategy</b>	<b>How is it fulfilled at this scale?</b>
<b>Deter</b>	Police or security presence can act as a deterrent.
<b>Detect</b>	The most obviously fulfilled by this scale’s surveillance imperatives. More vigilant parties make detection more likely.
<b>Deny</b>	N/A.
<b>Devalue</b>	N/A. In fact, increasing surveillance could actively work against devaluing the downtown—increasing security indicates value.

#### **ANTITERRORISM DESIGN FOR THE GRID**

At the inter-block and street level, antiterrorism design gives particular weight to concerns regarding vehicle impact vectors. Where target buildings are adjacent to roads that provide opportunities to accelerate to high speeds, the road configuration must be changed. There are three related antiterrorism

<sup>1</sup> Wayfinding systems are explained in more detail in the “CPTED in Action” section.

design possibilities. One strategy is to completely block off the street to vehicles, and, depending on security needs, even pedestrian access. Another option is to regulate traffic through a series of check points. The third option is to design the adjacent street in such a way that it is impossible for a vehicle to accelerate to high speeds. All three of these conditions can be a part of or effectively create something known as a ‘security zone.’

Security zones are “marginal spaces created as a result of security enhancements” (Hollander and Whitfield 2005). While the term was initially coined by the General Services Administration to describe layers of security that will be detailed in the next section, ‘security zone’ is now synonymous with both a desired impact (an additional setback for urban infrastructure) and with unappealing and unused space in a city. The unintended consequences of a security zone are similar to other unintended consequences of antiterrorism design: the marginalized space is unappealing and deserted, frightening potential users. This, in turn, minimizes the number of people who are available in an area to spot unusual or aggressive behavior (Hollander and Whitfield 2005).

Table 2. How ATD Strategies can be fulfilled at the scale of the Grid.

<b>FEMA 426 Antiterrorism Strategy</b>	<b>How is it fulfilled at this scale?</b>
<b>Deter</b>	Blocked off streets or check points will deter potential attackers, who would not be able to find an alternative route or procure clearance.
<b>Detect</b>	Checkpoints aid in detection of terrorists.
<b>Deny</b>	Blocking off a street and/or the creation of a security zone physically denies access to a site.
<b>Devalue</b>	N/A

## ON LOCATION: SECURITY ZONES

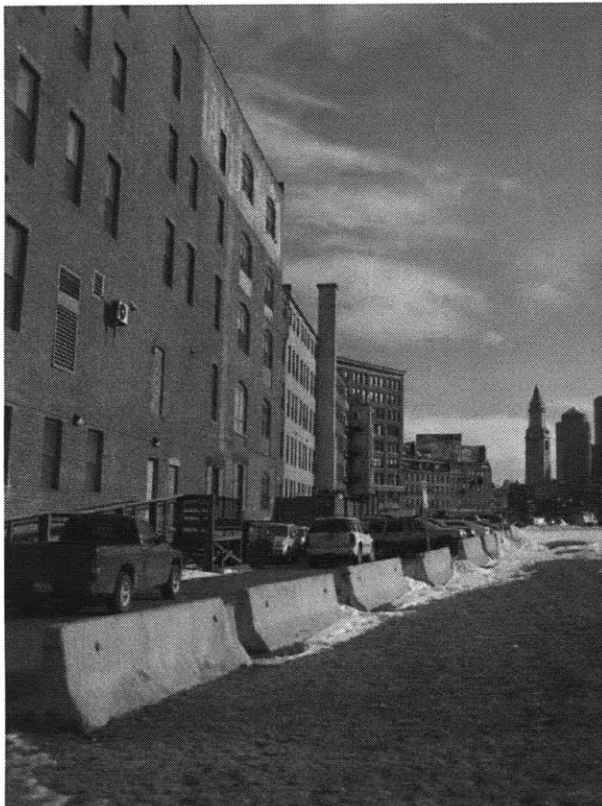
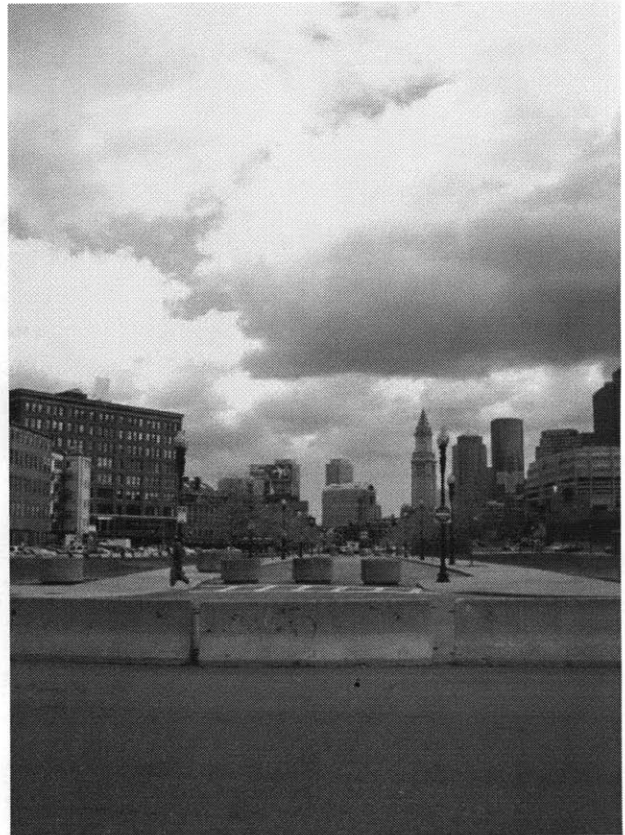


Figure 4. Photographs by Sara Rothrock.

Boston's Beverly Street security zone. While it is unclear as to what it is protecting (Mass Pike? North Station?) and why (other transit hubs are located below streets, why not this one?), it is clear that this is a marginalized area, created by planters and jersey barriers—the tools of antiterrorism design.

## ON LOCATION: VEHICULAR EXCLUSION



Figure 5. Photograph by Sara Rothrock.

Vehicle exclusion through physical design is an effective way of removing the threat of a car, truck, or van bomb from an area. Preventing vehicle entry can be accomplished through the introduction of bollards, planters, ditches, or other prohibitive structures. Adding dropped bollards and/or a gatehouse allows for a screening process to permit the admission of certain vehicles.



Figure 6. Photograph by Sara Rothrock.

Top: Getting the message across with a rising wedge at Duane St. at Lafayette St. in New York City.

Bottom: This sign at Boston's John F. Kennedy Federal Building does not simply instruct- it warns.

## ANTITERRORISM DESIGN AT THE SITE

The site level of the urban environment involves the sidewalk and building yard surrounding a potential target building. This level is considered most vital for physical antiterrorism interventions by security specialists and governmental guidelines. A physical security plan at the site level can include active or passive barriers that are visible or invisible to passersby, and that can be permeable, impermeable, or guarded.

Special care will be taken at the outermost boundary of the site, since stopping a vehicle or aggressor at the sidewalk affords a greater standoff distance. Standoff distance is “the distance between a barrier and a protected building” (The National Capital Planning Commission 2005). Since increasing standoff distance between the building and the possibility of a car or truck bomb is the ultimate goal of most physical site security interventions, security plans will first strive to see how far the building can be removed from the street. Since buildings are difficult to move once situated, increasing the distance between the street and the building can only be done by encroaching upon the street. Extending building yards and sidewalks are possible solutions. So, too, is closing off the street in front of the building (as discussed in the last section) and creating a security zone. In new construction, design standards call for large setbacks and standoff distances.

The amount of standoff distance afforded between a building and the site perimeter determines the extent and quality of physical interventions necessary to protect a site. There are different levels of

permeability of interventions as well as different levels of element stability.

### *Permeable Defenses*

Planters, bollards, and benches create barriers to large objects, but can be navigated by pedestrians or people on bikes. Normal iterations of these elements can be pushed aside or crushed by swiftly moving vehicles; however, if secured properly, these elements can become just as effective as walls. The Department of Defense has published guidelines regarding the level of protection offered by different elements and varying methods of below grade securing mechanisms.

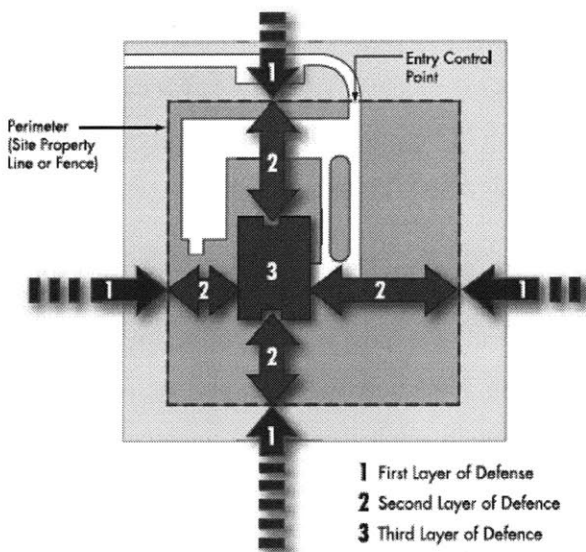


Figure 7. “Layers of Defense” from FEMA 430, 3-3 (2007). Secure design will always endeavor to create maximum standoff distance. Site design begins with “2: Second Layer of Defense.” Note the defined perimeter and understanding of the interface between the first and second layers.



The first U.S. guidelines for crash-resistant barriers were published in 1985. Guidelines specified different ratings for different levels of crash-resistance. Levels and ratings were based upon the degree to which a test vehicle could penetrate the barrier at certain speeds and weights (i.e. the vehicle's kinetic energy) (Stone Security Engineering 2009). A level 3 rating was the most secure, allowing vehicle penetration of only three feet inside the perimeter.<sup>2</sup> Level 2 allowed intrusion to twenty feet, and level 1 allowed intrusion of fifty feet (Federal Emergency Management Agency 2007, 4-10). Intrusion levels are measured beginning with the front of the cargo bed of the vehicle. This is where explosives would be kept.

In 2003 these ratings were revised and Levels 1 and 2 were dropped from the list of acceptable intrusion. The "Level" designation was replaced with "Kinetic," or "K"-ratings. K ratings were based on the speeds at which a 15,000 pound vehicle would have to be traveling to penetrate a barrier by three feet (the initial "level 3").<sup>3</sup>

The calculated energies are given the following ratings (Concentric Security, LLC 2010):

K12 = 50 mph  
K8 = 40 mph  
K4 = 30 mph

The 'levels' still exist, as L1, L2, and L3, though they are no longer considered useful for higher level security purposes. More recently, a new testing standard has emerged to create even more reliable K-ratings, and K-ratings for barriers responding to different types of vehicles. This new test is called ASTM F2656-07, the "standard Test Method for Vehicle Crash Testing of Perimeter Barriers." This standard was created by the American Society for Testing and Materials (ASTM) International in December 2007 (ASTM Standardization 2007).

Permeable defenses are often the most versatile interventions, and can be either active or passive in nature (in other words, moving or unmoving). Bollards are truly the most versatile of perimeter security devices. They can be decorative, echoing architectural detailing in the buildings they protect. They can be made of concrete, steel, or other materials, and they can come in any height or heft imaginable. That said, there are visual guidelines specified by FEMA 430 that are recommended for best integration into the streetscape. Typically, bollards are no taller than thirty inches (the height at which normal office desks stand), are spaced every three to four feet, and in long rows, are interspersed with other security

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<sup>2</sup> Level 3 was most applicable to urban environments, as few sites in downtowns have a setback greater than the width of a sidewalk.

<sup>3</sup> Kinetic energy can be calculated using the following equation:

$KE = 1/2 \times m \times v^2$ , where KE equals kinetic energy, m equals the mass of the vehicle, and v equals the vehicle's velocity on impact.

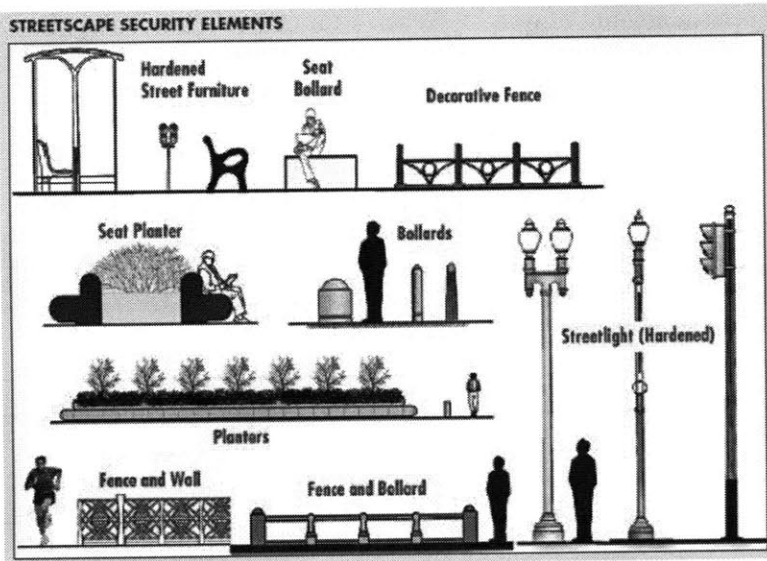


Figure 8. Streetscape Security Elements, from FEMA 430, 3-19 (2007).

elements or landscaping, and are round and thin. However, bollards can be creative elements in the streetscape. Large boulders, thickets of trees, or sculptural elements can function in the same ways as bollards, and can often enhance the streetscape instead of detract from it. Benches can be reinforced with K-rated bollards.

### *Impermeable Defenses*

Some impermeable defenses commonly used in urban environments are walls, terraces, raised planting beds, and fences. Walls are difficult elements to place in urban settings. They can create environments that are uncomfortable for the passerby, which can eventually diminish pedestrian activity on streets. In the event of an explosion, walls (typically made of concrete) can fragment and split into dangerous projectiles. As a result, designers often opt for shorter walls, which have the added benefit of preserving sight lines.<sup>4</sup>

Opportunities for less urban or larger, urban campus situations include berms, excavations, and ditches (or moats) are all types of barriers that can be constructed at the edge of a site. berms and ditches, which often appear as more ‘natural’ and less threatening landscape elements (Federal Emergency Management Agency 2007, 4-16). One particular type of ditch-berm-wall combination is known as the ha-ha. The ha-ha was invented in 17th century England to prevent cattle from wandering up to a house, while at the same time hiding the barrier to preserve the view. A ha-ha consists of a sheer drop-off, tall enough to prevent livestock (or cars) from scaling it, and of a correspondingly tall mound, placed several feet away from the drop-off. This creates the illusion that the drop-off does not exist, preserving a viewshed and protecting an area from unwanted cattle (or motorists).

Another intervention useful at large urban sites is the tiger trap. This intervention is only useful in areas accessible only to pedestrians and cyclists. Tiger traps are reinforced concrete holes covered by a

<sup>4</sup> Sightlines will be explored in the chapter on CPTED in Action.

surface that is capable of holding only a certain amount of weight. When a car or truck drives atop the tiger trap, it falls into the reinforced concrete ditch below.

Table 3. How ATD Strategies can be fulfilled at the scale of the Site.

<b>FEMA 426 Antiterrorism Strategy</b>	<b>How is it fulfilled at this scale?</b>
<b>Deter</b>	Visible interventions, like bollards or walls, might deter potential attackers.
<b>Detect</b>	N/A
<b>Deny</b>	K-rated interventions as well as inventions such as the ha-ha or tiger trap are designed to stop terrorists.
<b>Devalue</b>	N/A

#### **ANTITERRORISM DESIGN FOR THE BUILDING**

Antiterrorism design for buildings involves both visible and invisible strengthening. First, building orientation should be inward. Buildings should ‘look’ inward on a site. Critical functions should be relocated from lower floors to remove obvious targets. If possible, windows should be removed from lower floors altogether. Where this is not possible, windows should be reinforced with shatter-proof layers. The base of the building and outward structural elements should also be reinforced in order to have a better opportunity of withstanding an explosion. Loading docks, garages, and lobbies should be staffed by security personnel. The process of securing a lobby area with turnstiles, metal detectors, and a sign-in sheet for visitors is also called lobby hardening. Electronic surveillance (CCTV) should be used intensively (Federal Emergency Management Agency 2007, 223). Additionally, all entryways should be well-lit at night in order to better detect possible intruders.

Table 4. How ATD Strategies can be fulfilled at the scale of the Building.

<b>FEMA 426 Antiterrorism Strategy</b>	<b>How is it fulfilled at this scale?</b>
<b>Deter</b>	The hardened lobby area and presence of security is meant to deter.
<b>Detect</b>	CCTV, security at all entryways, lighting for visibility of potential aggressors at night are all designed to detect terrorists.
<b>Deny</b>	Reinforced buildings, minimized ground floor windows, reinforced windows, and inward facing buildings are designed to minimize damage by explosives.
<b>Devalue</b>	Removing critical functions from obvious places and removing windows from the bottom floor seek to devalue buildings.



## CONCLUSION

As exemplified in this chapter, the ultimate goals of antiterrorism design are to deter, detect, and deny terrorists, and to devalue critical buildings. The various scales of physical interventions that have been conceived as the cannon of antiterrorism design endeavor to meet these goals. However, it seems that the last goal, that of 'devaluing' properties, is difficult to meet given the highly visible nature of the simultaneous goal of 'deterring.'

The next chapter will explore the history of place-based crime preventions. The chapter will end with a description of Crime Prevention Through Environmental Design (CPTED). Place-based crime prevention and CPTED are relevant to the Antiterrorism Design history and principles discussed above; however, the similarities and differences will not be revealed until later in the thesis.



CHAPTER 3  
HISTORY OF PLACE-BASED CRIME PREVENTION

Place-based crime prevention evolution and the creation of crime prevention through environmental design (CPTED) are important to cultivating an understanding that design can influence behavior and create safer environments. Tangential to this argument is that CPTED and other place-based crime prevention strategies offer alternatives to militarization of environments in order to increase safety. Place-based crime prevention strategies and CPTED function mainly through creating a readable design aesthetic whereby it is easier for participants in an environment to cognitively infer appropriate and inappropriate (or suspicious) behavior (in themselves and others) and react accordingly.

There are four basic elements to every crime event: a law that can be broken, an individual who breaks that law, a target for the crime event (in the form of a victim or property), and a place where the crime occurs (Brantingham and Brantingham 1981). Place-based or ‘environmental’ crime prevention is

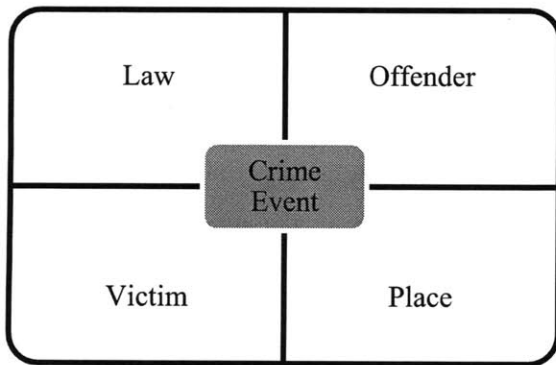


Figure 9. Place-based crime chart.

concerned primarily with the fourth and most tangible of these dimensions: the physical location of the crime. There are several reasons to independently analyze the role of environment in crime:<sup>1</sup>

1. Compared with the other elements of crime, places are easy to analyze. While quality of a space might be difficult to quantify, other details, such as surrounding land use, presence of security cameras, or distance to the next through-street are readily measurable.
2. Since the 1800s there has been documented proof that some locations are more prone to crime events than others (Cozens, Saville and Hillier 2005). These are known as ‘hot spots.’ A geographic indicator for the likelihood of crime is apt to have a cause rooted in some type of physical-spatial quality.
3. While the other elements of crime are commonly analyzed in the wake of an event (who did it, who was harmed, what does the law say), place is normally overlooked. Location may be mentioned, as in “this is the fourth mugging along Sinister Street this week,” but it is uncommon for commentary to consider how the actual physical environment may have contributed to the crime.

<sup>1</sup> It is important to note that place-based crime prevention techniques do not dismiss the importance of the other dimensions of a crime event; in fact, all experts advocate for addressing other elements simultaneously.

The discipline known as Crime Prevention Through Environmental Design (CPTED) acknowledges the importance of place and design in crime events. The most widely-accepted premise of CPTED is that “the proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime—and to an increase in the quality of life” (Crowe 1991). CPTED presents its disciples with a set of generalized design concepts, which, if crafted carefully to a specific location, will help alleviate crime. The principles and premise behind CPTED evolved from several disciplines, institutes, and decades of study. This chapter will chronologically explore the roots of modern CPTED, culminating with an explanation and thorough discussion of the field as it exists today.

Jane Jacobs is credited with bringing attention to the requisites of safety in the urban environment. In her seminal work, *The Death and Life of Great American Cities*, she wrote that

A city street equipped to handle strangers, and to make a safety asset, in itself, out of the presence of strangers...must have three main qualities: First, there must be a clear demarcation between what is public space and what is private space...Second, there must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street. The buildings on a street equipped to handle strangers...must be oriented to the street...And third, the sidewalk must have users on it fairly continuously (Jacobs 1961, 35).

This passage and adjacent sections are commonly known as Jacobs’ ‘eyes on the street’ theory. They focus upon the idea of maintaining a critical mass of pedestrian traffic in a particular area. She hypothesized that a busy place that people care about is more safe than a vacant place that ‘turns its back’ to the street. Vibrant places are interesting to look at—Jacobs herself described her immersion as a spectator in what she called “the sidewalk ballet.” Essentially, in this passage, she identified three design strategies for safety: obvious separation of public and private, buildings that face the street, and a critical mass of pedestrian traffic. These three strategies would later come to be known, respectively, as territoriality, natural surveillance, and milieu. She asserted that these strategies could be best achieved through mixed land use, or maintaining “a substantial quantity of stores and other public places sprinkled along the sidewalks of a district” which thrive alongside residences, and which open and close at different hours of the day and night (Jacobs 1961, 36). This way, there are always people watching and being watched—strangers inadvertently keeping one another safe.

After the publication of *The Death and Life of Great American Cities*, the academic community published reactions to citizen advocacy and urban renewal as discussed in the book; a relative few reacted by engaging in research on Jacobs’ eyes on the street theories. A 1962 *Journal of the American Planning Association* article considered pedestrian flow, and a 1967 article by Stanford M. Lyman and Marvin B. Scott explored “Territoriality: A Neglected Sociological Dimension” (Morris and Zisman 1962). Perhaps Jacobs’ argument for the spatial dimensions of urban safety was devalued after Lewis Mumford’s critique

of her work, which dismissed her interest in lively streets as “Mother Jacobs’ Home Remedy for Urban Cancer” (Mumford 1962).

In 1968, a graduate student at the University of California, Berkeley, took up the case again. Shlomo Angel published a working paper that recognized the increasing rate of crime in American cities, the paucity of data on the subject, and his confidence that responsible urban planning could help to curb the problem (Angel 1968). Angel wrote about Jacobs’ observations and coined his own term, ‘critical intensity zone,’ which he used to describe the pedestrian density at which there are enough people in a place to pique the interest of potential offenders, but not enough to “provide for an adequate surveillance function” (Angel 1968, 17). Following this, Angel wrote (in a Lynchian way) about circulation and land use:

It is fairly obvious that the form of urban environment affects the distribution and circulation patterns of its inhabitants. People generally walk along sidewalks or streets but seldom traverse blocks. People follow designated paths in parks and gardens; they tend to wait for the bus at the bus station and not along its route; and, they enter their homes through the front or back door. Changes in the design of the physical environment will, therefore, affect their circulation behavior and the frequency of meeting and seeing other people (17).

The remainder of his paper focused upon the creation of scenarios wherein he could manipulate pedestrian density so as to pull it out of the critical intensity zone of crime (i.e. have enough pedestrians for surveillance function), or to force the density so low so as to eliminate potential victims. Angel indicated that he intended to achieve these effects through the creation of nodes of concentrated businesses that function on a similar temporal axis, grouping compatible land uses, and by providing more adequate parking.

Also significant to the Angel paper was his mention of a 1965 crime prevention piece by Peter P. Lejins (Lejins 1965). At the 95<sup>th</sup> Annual Congress of Correction of the American Correction Association, Lejins identified three categories of crime prevention. These included punitive, corrective, and mechanical prevention. The latter of these three, mechanical prevention, could be achieved “by placing obstacles in the way of potential offenders so that it becomes difficult or impossible for them to perpetrate the offence,” and no attempt is made “to influence his intention to commit an offense by threat of punishment, nor is an attempt made to change his motivation” (Lejins 1965, 148). This concept later became increasingly important to practitioners in the world of environmental crime prevention. Of particular note is the stress that subsequent authors place on the difference between *motivation* for a criminal action and *opportunity* for a criminal action. While it is possible that environmental techniques

will foil directed, motivated crime, they are even more likely to prevent the opportunity of crime, thus thwarting crimes of convenience or impulse.<sup>2</sup>

In the 1970s the director of the Institute of Planning and Housing at New York University, Oscar Newman, was awarded funding to research public housing in New York by the National Institute of Law Enforcement and Criminal Justice of the U.S. Department of Justice (Newman, *Defensible Space: Crime Prevention Through Urban Design* 1972, ix). Through a number of studies, Newman was able to prove that the architecture of public housing influenced human behavior and the incidence of crime at a given site. As a result of his research, Newman created several principles he believed were vital to the creation of healthy behavior around public housing:

- *Territoriality* involves the importance of subdividing a property into zones for ‘managers’ in order to bestow a sense of ownership.
- *Surveillance* refers to the ability to view all public areas.
- *Boundary definition* speaks to the need to make clear transitions from public areas to private ones.
- *Image* recognized that cognitive association also plays a role, asserting that external perception from a viewer influences actual experience of a space. In other words, architecture should be sensitive to the fact that there is stigma involved with public housing, and should strive to create more humane forms.
- *Milieu* harkens back to the concerns of both Jane Jacobs and Shlomo Angel. Newman cautioned that selecting a site for a new development is important, since placing a project in a safe neighborhood will allow the managers to build off existing security conditions. Complementary land uses are vital (Newman, *Defensible Space: Crime Prevention Through Urban Design* 1972).

Newman’s conclusions opened new worlds for the fields of crime prevention, architecture, and planning. They contained the potential to give power back to the people who lived in housing projects. As one writer pointed out,

the attractiveness of Newman’s ideas was that...his main aim was to find ways of changing the underlying structure of the environment so that it would not attract criminal behavior, and that it would enable residents to control access to their homes and the use of surrounding areas (Poyner 1983, 10).

The legacy of Newman’s first work is such that even urban planners, notorious for their indifference to CPTED and environmental criminology, can identify the main concepts of Defensible Space and recall its importance to the new era of American public housing.

Newman’s book on the subject was called *Defensible Space: Crime Prevention through Urban Design*. Strangely enough, a book published one year earlier had a similar title. C. Ray Jeffery, a criminologist, wrote about using the physical environment to influence potential criminal behavior. In this predecessor to modern CPTED, Jeffery’s 1971 *Crime Prevention Through Environmental Design*

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<sup>2</sup> This distinction will become more important later in this paper, where I explore the intersections between designing for public safety and designing for antiterrorism.

argued that attempting to rehabilitate individual criminals through the positive school of criminology (the trend at the time) was a dismal failure. He believed that programs that sought to reduce crime through efforts aimed at poverty reduction were on the wrong path. Certain populations (like the poor) were not more likely to commit crimes; certain environments were more likely to provide the opportunities to commit them. He felt that, to reduce future incidents of crime, there needed to be new forms of behavioral research, and that this research should inform changes in the environment.

Jeffery's and Newman's works were well-received by both the planning and criminology fields. Crime Prevention Through Environmental Design and Defensible Space became respected concepts. A CPTED Demonstration Program directed by the Westinghouse National Issues Center (through the National Institute of Law Enforcement and Criminal Justice) emerged to evaluate CPTED principles in real life situations. The four year study (1974-78) observed several case studies and produced a work called *The CPTED Compendium* (Vito, Maahs and Holmes 2007, 72). During this time, Jeffery re-worked his 1971 book, ultimately creating a more useful guide with specific examples, details, and suggestions as to how various professionals might take part in crime prevention (Jeffery 1977).

Even though Jeffrey coined the term and inspired initial studies, his work is generally considered part of the field of environmental criminology, rather than explicitly a part of modern CPTED. Environmental criminology "argues that some places are much more vulnerable than others and criminal events will tend to occur frequently at such places" (Herbert and Hyde 1985, 261). Environmental criminology differs from CPTED in its continued focus on psychology and behavioral studies in addition to its geographical context. One writer stated that CPTED "does not purport to develop crime prevention solutions in a broad universe of human behavior but rather solutions limited to variables that can be manipulated and evaluated in the specified man/environment relationship" (T. Crowe 1991, 29). In contrast, in Brantingham and Brantingham's seminal piece *Environmental Criminology*, the authors state that "Environmental criminologists set out to use the geographic imagination in concert with the sociological imagination to describe, understand, and control criminal events" (Brantingham and Brantingham 1981, 21). There are three key theories within environmental criminology, which include pattern theory by the Brantinghams, routine activity theory by Marcus Felson and rational choice theory by Ronald V. Clarke. Pattern theory involves the concept that neither crime nor criminal opportunity is random, and that everyone, including criminals (those who form crime templates), have normal spatial-temporal patterns (Brantingham and Brantingham 2009). Routine activity theory purports that three things must be happening at the same time and place (a target must be available, a guardian of the target must be absent, and a motivated offender must be present) (U.K. Home Office 2003). Rational choice theory purports that criminals seek to benefit from their actions, and therefore must use some type of cost-benefit analysis when considering criminal acts (U.K. Home Office 2004).

The solidification of the field of environmental criminology rolled easily into the advent of situational crime prevention. Situational crime prevention owed its philosophy partially to environmental criminology, but veered from this discipline with research into community-police networks working together to protect neighborhoods. Situational crime prevention strongly advocated for citizen

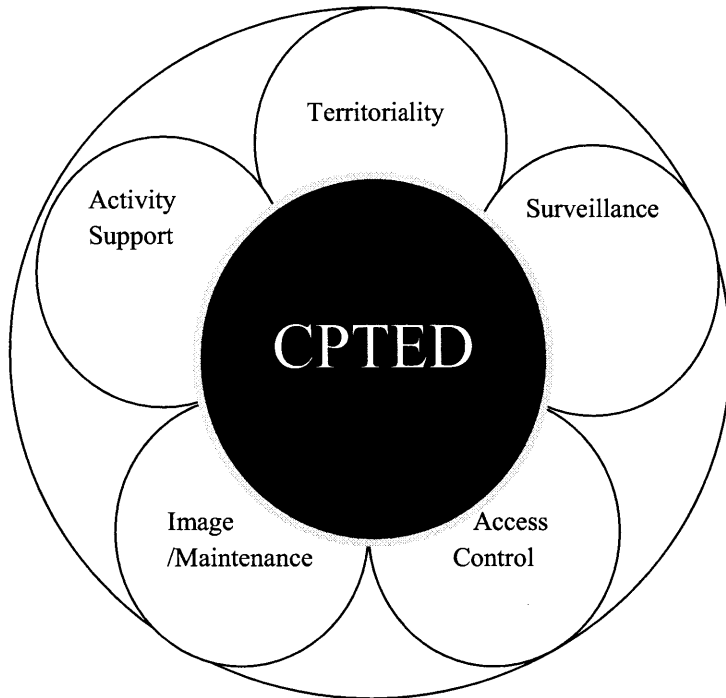


Figure 10. CPTED chart as adapted from Moffat, 1983 (Cozens, Saville and Hillier 2005)

participation, citizen-police cooperation and relationships, and neighborhood maintenance. In 1982 George L. Kelling and James Q. Wilson published the defining piece of this movement: an article entitled “Broken Windows” in *The Atlantic Monthly* (Kelling and Wilson 1982). The article was informed by two major sources. First was Kelling’s experience on ‘foot patrol’ (as a cop walking a neighborhood beat) in a Newark, New Jersey neighborhood. The second was a study by psychologist Philip Zimbardo. From these, Kelling and Wilson constructed a theory of the need

for “order-maintenance” in communities.

The shorthand for their philosophy was

“Broken Windows,” named as a result of the general consensus among social psychologists and police officers that, once one window is broken and left untended, more broken windows will follow. This results from the general feeling that a broken window projects an air of neglect, and, since ‘no one cares,’ vandalism will ensue. Essentially, unchecked disorder begets still more disorder.

This mandate of maintenance from situational crime prevention only served to underscore Newman’s principle of territoriality. In 1988, the director of the National Crime Prevention Institute, Timothy Crowe, penned an article synthesizing principles learned from Defensible Space, environmental criminology, and situational crime prevention. The combination of these fields and practices he called CPTED. The six-page piece explained basic principles and contained clear diagrams showing good and bad design (T. Crowe 1988). Crowe followed this up with a much more extensive book in 1991. The book, written in a conversational tone for a broad audience, implored the reader to look at the surrounding environment in different ways. CPTED is not presented as an academic field or specialized design



regimen, but rather as good old-fashioned common sense. CPTED is deliberately non-threatening, both in approach and philosophy (T. Crowe 1991).

Crowe calls for a ‘three ‘D’ strategy,’ stating that all one needs to remember is ‘Designation, Definition, and Design.’ This is a device to help users remember the main principles of CPTED: natural surveillance, natural access control, territorial reinforcement, activity support, and maintenance and management. As indicated earlier, these principles are a combination of imperatives from the disciplines that led to CPTED, with a heavy emphasis on Oscar Newman’s Defensible Space theories. Note, though, the stress on the term ‘natural.’ The ‘natural’ is about spatial definition and integrative design rather than more ‘mechanical’ or ‘organized’ methods, which require things like locks and guards.

To fulfill the main CPTED principles, Crowe suggests specialized employment of nine strategies:

1. Provide clear border definition of controlled space.
2. Provide clearly marked transitional zones.
3. Relocate gathering areas.
4. Place safe activities in unsafe locations.
5. Place unsafe activities in safe locations.
6. Re-designate the use of space to provide natural barriers.
7. Improve scheduling of space.
8. Redesign or revamp space to increase the perception of natural surveillance.
9. Overcome distance and isolation.

Crowe provides general examples of each of these strategies, and later provides a number of diagrams of “poor” and “good” site plan examples of everything from parking lots to pedestrian plazas to schools. (T. Crowe 1991, 106).

This founding work established CPTED as a worthwhile process and is now known as “first generation CPTED.” In the late nineties a “second generation” CPTED began to evolve, with a more directed focus at community building than simply the built environment. However, even community building has physical aspects. In Saville and Cleveland’s piece on second generation CPTED, they identified elements of a Dutch CPTED plan that they considered progressive. These elements included

- The necessity of human-scale development
- The importance of urban meeting places
- Establishment of youth clubs
- Engaging residents in order to procure participatory support and encourage responsibility regarding maintenance and upkeep.(Saville and Cleveland 1997).

As of a publication in 2003, the authors condensed these concepts into four phrases: neighborhood capacity, community culture, cohesion, and connectivity (Saville and Cleveland, An introduction to 2nd Generation CPTED 2003).

As I will discuss later in this thesis, this newest version of CPTED is extremely meaningful when put in the context of ATD in urban downtowns. I will attempt to advance thoughts on these four Dutch elements in my discussion of the need for Civic Design principles within all CPTED/ATD strategies.

### **CPTED CRITICS AND LIMITATIONS**

As with all crime prevention strategies, CPTED has its limitations, and is meant to be used in conjunction with other tactics. The process has been criticized largely for its displacement effects—a tendency to simply move crime from one place to another. A book by Hakim and Rengert asserts that crime can be displaced in five dimensions: location, time, tactics, targets and type of crime (Hakim and Rengert 1981). CPTED practitioners, however, maintain that displacement is a result of all crime prevention strategies, and that CPTED's failings in this regard are not unique. In fact, difficulties attributed to other crime prevention strategies can be attributed to CPTED as well: an inability to deflect irrational offenders (those that are intoxicated), and difficulty maintaining safety in areas that are largely vacant.

A criticism more unique to CPTED, however, is that criminals can use the same principles to create their own territories, or “offensible space” (Atlas 1991). Additionally, CPTED is sometimes blamed for creating fortressing affects on communities and sites, but fortressing, while a concept in early CPTED iterations, has been roundly denounced in modern evolutions. Fortressing or target hardening tends to force people behind walls and out of public space, frightening residents and peeling eyes away from the streets (Cozens, Saville and Hillier 2005).

### **CONCLUSION**

As Timothy Crowe writes in his book, “CPTED is a process and not a belief system.” Crowe, as well as his predecessors, allowed the field to have room to evolve and refine its principles. As described by contemporary scholars, CPTED has evolved into a more community-oriented process. While this evolution is admirable, it is worth noting that CPTED was conceived of as necessitating community interaction even at its onset, as situational crime preventions remains one of the pillars upon which it was created.

This history of CPTED and an understanding of its evolution is vital to supporting the central argument of this thesis: that CPTED is capable of demilitarizing antiterrorism design and making it more philosophically acceptable in an open civilian society and more physically acceptable in American downtowns.

## CHAPTER 4: CPTED IN ACTION

As examined in the evolution of place-based crime prevention, CPTED evolved from several disciplines all concerned with the impact of design on behavior. CPTED strives to control five elements (natural surveillance, territoriality, activity support, maintenance, and access control) in order to create an environment less prone to criminal activity. These elements ultimately help users to better understand appropriate and inappropriate behaviors in a space. According to Timothy Crowe, there are nine basic principles that aid in the implementation of CPTED. They are again presented here, and supplemented by a tenth, important principle:

1. Clear border definition of controlled space.
2. Provide clearly marked transitional zones.
3. Relocation of gathering areas.
4. Place safe activities in unsafe locations.
5. Place unsafe activities in safe locations.
6. Re-designate the use of space to provide natural barriers.
7. Improve scheduling of space.
8. Redesign or revamp space to increase the perception of natural surveillance.
9. Overcome distance and isolation.
10. Ensure that the space is maintained.

These principles can be adhered to at different urban scales by employing various strategies. Since this thesis is particularly concerned with urban downtowns, only four scales will be analyzed: the scale of the Central Business District, the scale of the grid within the Central Business District (the streets and blocks within the downtown), the scale of the business campus or site (where one entity clearly defines territory), and the scale of a target building.

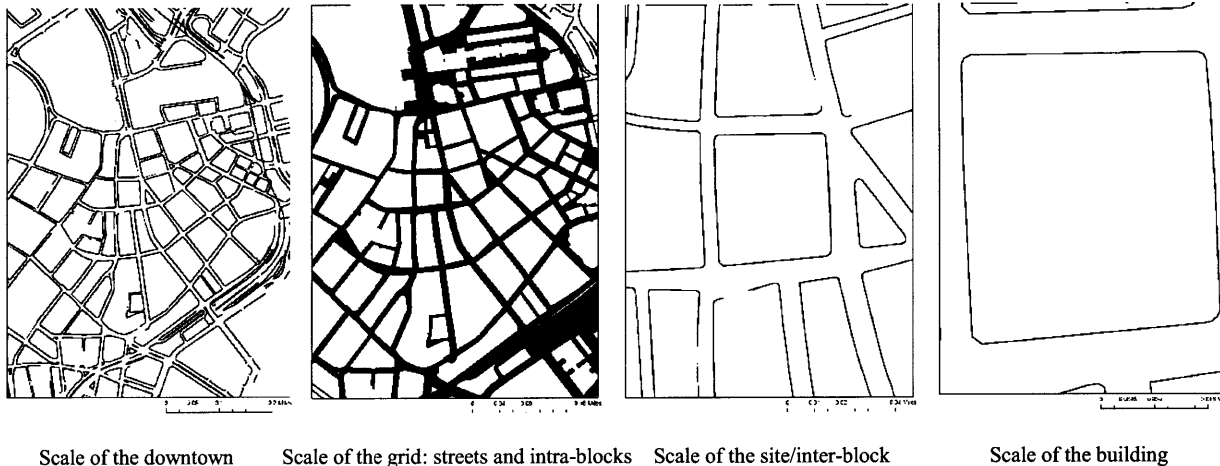


Figure 11. Scales of Downtown. These images indicate the corresponding scale of the intervention mentioned below.

The principles articulated above will be revisited as each scale is examined. This will provide an opportunity to understand how CPTED design strategies align with CPTED design goals.

#### **CPTED DOWNTOWN**

Implementing CPTED on an urban downtown scale necessitates the enforcement of two relevant design criteria: ensuring mixed land uses and encouraging complementary diverse hours of operation are essential strategies. Ensuring mixed uses in an urban downtown is a concept that harkens back to the studies of Jane Jacobs. Mixed use ensures symbiotic relationships and promotes round-the-clock use. Mixed use implies that there will always be people in the district—whether they be there to shop, do business, eat, or sleep. Consistent inflow and outflow of people ensures eyes on the street. Residents, in particular, will be likely to ‘defend’ the district and look out for one another. They will be quick to call in issues regarding maintenance and they will be more aware of unusual behavior.

Considering issues related to time of operation is crucial. If all commercial and consumer interests in a downtown close at the same time, the area becomes isolated and desolate for those who have to frequent the district after hours. Business people working late, night workers, and residents of the area are at risk. If uses that stagger hours are promoted, though, there is guaranteed to be a certain population within the district at all times. Another option is to cluster operations that all serve patrons who keep later hours. This will concentrate activity in one node, and ensure that individuals do not have to travel far to get the things that they need. Concentrating uses of similar operation hours enables the district to avoid Shlomo Angel’s ‘critical density’ of criminal activity (enough people to be victims but not enough people to witness and intervene in the assault). People will recognize these nodes as more secure, and will gravitate toward them, supporting critical densities of activity.

Table 5. How CPTED Strategies can be fulfilled at the scale of the Downtown.

<b>Crowe Strategy</b>	<b>Fulfilled? How?</b>
<b>1. Clear border definition of controlled space.</b>	N/A
<b>2. Provide clearly marked transitional zones.</b>	N/A
<b>3. Relocation of gathering areas.</b>	Clustering uses with similar hours of operation
<b>4. Place safe activities in unsafe locations.</b>	N/A
<b>5. Place unsafe activities in safe locations.</b>	Clustering uses with similar hours of operation (alone, these uses may become marginal and used only by individuals comfortable with braving the city at night)
<b>6. Redesignate the use of space to provide natural barriers.</b>	N/A
<b>7. Improve scheduling of space.</b>	Mixed use development and clustering uses with similar hours of operation will diversify scheduling
<b>8. Redesign or revamp space to increase the perception of natural surveillance.</b>	Mixed use development and clustering uses with similar hours of operation increases the users at any time of day, increasing perception of natural surveillance
<b>9. Overcome distance and isolation.</b>	Mixed use development encourages a livelier city, and clustering uses ensures users do not need to travel far to reach their next destination.
<b>10. Ensure that the space is maintained.</b>	Mixed use indicates that there will be residents and store owners in the area. These people have incentive to take ownership of the district and ensure maintenance needs are met.

#### CPTED FOR THE GRID

At the inter-block and street level, CPTED gives particular weight to concerns about wayfinding, movement predictors, and clear sightlines. Streets, walkways, and pedestrian tunnels are valuable parts of the grid's public environment. However, it is possible that glaring safety issues can escape the notice of urban design professionals who have not learned to consider basic crime prevention theories.

ON LOCATION: MOVEMENT PREDICTORS



Figure 12. Photographs by Sara Rothrock.

Above: Pedestrian pathway around One Police Plaza in New York City. Note visual permeability with iron fencing, but lack of mirror to improve sightlines around corner. Notice man at bottom of stairs give the corner a wide berth—an instinctive safety measure.

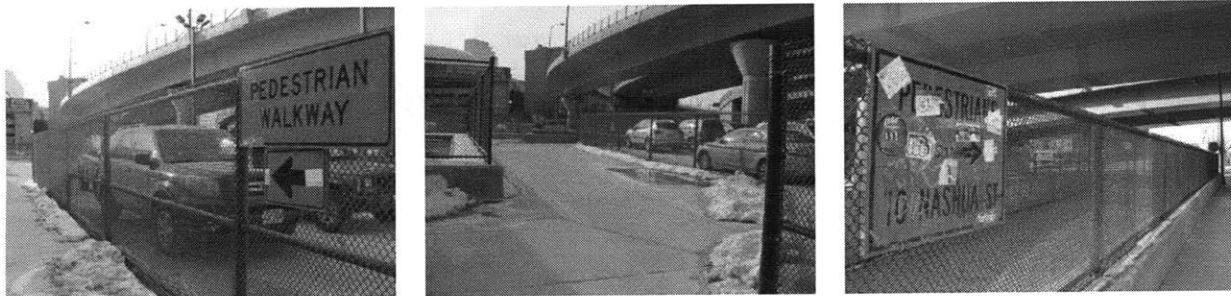


Figure 13. Photographs by Sara Rothrock.

Above: The pedestrian walkway behind TD Bank Garden in Boston. This movement predictor offers visual permeability with its chain link fence, and good sightlines (note how easy it is to see around curves in the middle picture). However, the graffiti on the sign in the last picture does not inspire confidence regarding other users of the space or how well the walkway is patrolled by police.

To ensure safety on streets, users should have access to obvious wayfinding systems. A wayfinding system can be as simple as a map of the area, or interspersed signs that direct users in a specific direction toward points of interest. Wayfinding is a safety element because it allows pedestrians to move directly to a desired location. Lost and wandering tourists and district visitors make easy targets for criminals. A wayfinding system allows pedestrians to be less vulnerable and more knowledgeable about their surroundings (T. Crowe 1991).

Movement predictors are of particular concern in urban environments. Movement predictors are linear paths designed in such a way that pedestrians are funneled in a predictable direction. As a result, pedestrians are not given the opportunity to flee in an unpredictable direction when faced with an aggressor. Pedestrian walkways and tunnels are common types of movement vectors. So, too, are streets that extend for multiple blocks without through-ways (like alleys). Movement predictors are often interspersed with 'entrapment spots,' which are usually alcoves designed to provide relief from the relentless linearity of the vector. Unfortunately, entrapment spots provide the opportunity for aggressors hide and wait, out of sight, and prepare to assault unsuspecting passersby (Planning and Development Department of the City of Toronto 1992).

Movement vectors cannot easily be altered once established in an urban area. However, they can be mitigated by allowing for clear sightlines and visual permeability of barriers (Planning and Development Department of the City of Toronto 1992). A sightline is a device that establishes how far along a path an individual can see. When a movement predictor bends to the side, the pedestrian does not know what could be waiting just out of sight. To improve the sightline, a mirror can be installed at the corner. A mirror will allow those beyond the bend to see approaching figures. Additionally, visual permeability can be built into a movement predictor by allowing pedestrians to be able to see through barriers on either side. For example, if pedestrians are shuttled through a fenced walkway, the fences should be wrought iron or chain link to provide a view beyond the pathway. Entrapment areas in movement vectors should be sealed off at night.

Table 6. How CPTED Strategies can be fulfilled at the scale of the Grid.

Crowe Strategy	Fulfilled? How?
1. Clear border definition of controlled space.	N/A
2. Provide clearly marked transitional zones.	N/A
3. Relocation of gathering areas.	N/A
4. Place safe activities in unsafe locations.	Mitigation technique for entrapment areas
5. Place unsafe activities in safe locations.	N/A
6. Redesignate the use of space to provide natural barriers.	N/A
7. Improve scheduling of space.	Entrapment areas should be capable of closing at night
8. Redesign or revamp space to increase the perception of natural surveillance.	Increase visual permeability throughout movement predictors to see out and see in
9. Overcome distance and isolation.	Wayfinding systems should be installed to help individuals identify nearby points of interest that will be more densely populated.
10. Ensure maintenance for the site.	N/A

**CPTED AT THE SITE**

The site level of the urban environment involves the sidewalk and building yard surrounding a building. Design at this level is largely under the control of the private interests invested in the building or

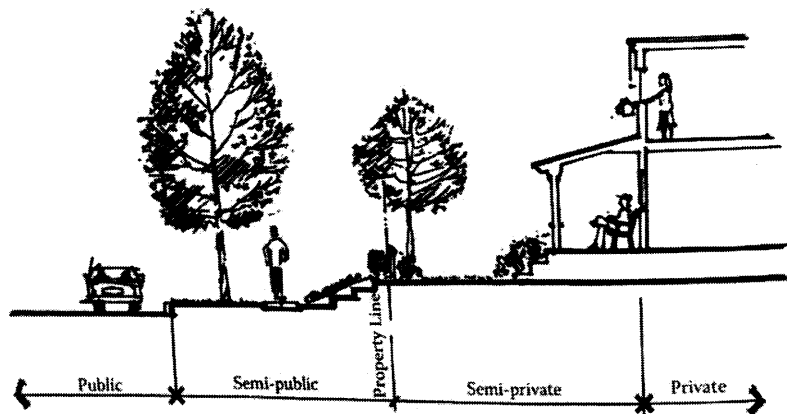


Figure 14. How public is this space? Source: Atlas, 21<sup>st</sup> Century Security, p. 58 (2008).

companies within the building. Changes on public sidewalks will necessitate public approval, but changes in the building yard or other accompanying space are private domain.

To effectively incorporate CPTED into a design, the designer must first establish a zone of influence around a property, using a ‘hierarchy of transition.’ In other words, a site designer

should be able to design the site in such a way that it alerts pedestrians as to the degree of publicness of a particular area (Newman, Design Guidelines for Creating Defensible Space 1976). To do this, CPTED promotes using natural or ‘symbolic’ barriers, like shrubs, changes in grade, paving texture, and light



standards to alert pedestrians that they are entering a new zone (T. Crowe 1991). These are used to subtly inform an individual that she or he is moving from a public space to a semi private space to a private area.

Amenities and signs can also serve as symbolic barriers to delimit a hierarchy of privacy. They make it clear who belongs where and for what purpose. Often the public is invited into the semiprivate plaza of an office complex in urban areas. Providing amenities in these areas (like bathrooms, benches, and vendors) alerts pedestrians that they are welcome in what otherwise might seem like a private area.

Open public space, such as office plazas, green spaces, or parks, is in particular need of clear delineation. “Well-designed and clearly allocated recreation facilities improve the security of an area by creating outdoor extensions of the dwelling unit that residents can identify and control. Distant and undefined recreation and green facilities, whose intended users are unclear, often go unused or are vandalized” (Newman 1976, 112). Without clear notice of rules at a site, the site can become marginalized.

Promoting activity in a public space is particularly important. William Whyte, the father of public space studies, built his career around learning what makes public spaces active. In the 1960s he was commissioned by the Municipal Art Society and the New York City Planning Department to ascertain why some of New York’s privately-owned public spaces were more popular than others. His findings included generalizations about indicators for good public space (people stopping in the middle of crowds to talk, kissing in public) and what, in all likelihood, creates a good public space in the first place (plenty of seating, water features) (Whyte 1988).

Lighting is also an important aspect of CPTED. At night, strategic lighting creates a path for site users. It does this job indiscriminately—it lights the way for an individual to see where he or she is stepping, but it also affords hidden assailants a view of where you are. As a result of this effect, lighting can lead to a false sense of confidence in unsafe places. The best argument for improved nighttime lighting advocates for an individual to be able to identify the face of a person fifty feet away. “The ability to have eye contact with a person you are about to pass at a reasonable “flight” distance is a common measure of security” (Planning and Development Department of the City of Toronto 1992). This type of light is good. But, like too little lighting, too much lighting can be bad. Security lights outside doorways are often too harsh. This harshness temporarily blinds the viewer, and an assailant could easily be cloaked in darkness immediately beside it (which your eyes, trying to account for the security light, would not be able to detect). In other words, “the lighting glares towards the person approaching, making it impossible to see that person” (Planning and Development Department of the City of Toronto 1992, 12). Light is a powerful tool, and lighting schemes should be designed carefully to enhance the site and improve safety.

Table 7. How CPTED Strategies can be fulfilled at the scale of the Site.

<b>Crowe Strategy</b>	<b>Fulfilled? How?</b>
<b>1. Clear border definition of controlled space.</b>	Transition hierarchies on all sites to determine difference between public, quasi public, semi private, and private space
<b>2. Provide clearly marked transitional zones.</b>	Pavement pattern, landscaping, street furniture
<b>3. Relocation of gathering areas.</b>	N/A
<b>4. Place safe activities in unsafe locations.</b>	N/A
<b>5. Place unsafe activities in safe locations.</b>	N/A
<b>6. Redesignate the use of space to provide natural barriers.</b>	If there was a stream on the property, they could use it.
<b>7. Improve scheduling of space.</b>	N/A
<b>8. Redesign or revamp space to increase the perception of natural surveillance.</b>	Activity control and promotion of milieu in public space.
<b>9. Overcome distance and isolation.</b>	Make public spaces and sites interesting places to be.
<b>10. Ensure maintenance at the site.</b>	N/A

#### **CPTED FOR THE BUILDING**

CPTED for buildings in urban environments involves building orientation, opportunities for windows, proper lighting, close-circuit television (CCTV) for surveillance, and hardened lobbies. Building should always face out toward the street. Directing the ‘gaze’ of the building in this manner allows for increased surveillance of building users from windows. The lower floor should have windows for clear sightlines from the sidewalk into the building and vice versa. A lighting designer should strategically place lamps in vulnerable areas so as to increase the visibility of potential aggressors. CCTVs should be used, and placed on the building in a way that entrances and exits are monitored. CCTV is most effective at preventing crime when it is visible, so care should be taken to provide a sign to let users know that they are being monitored. Lastly, lobbies can be hardened with turnstiles, security, and sign-in sheets in order to deter potential criminals from entering the building.

Table 8. How CPTED Strategies can be fulfilled at the scale of the Building.

<b>Crowe Strategy</b>	<b>Fulfilled? How?</b>
<b>1. Clear border definition of controlled space.</b>	Hardened lobbies and the indication of security cameras delineate that the user is moving into private space.
<b>2. Provide clearly marked transitional zones.</b>	Hardened lobbies and the indication of security cameras delineate that the user is moving into private space.
<b>3. Relocation of gathering areas.</b>	The hardened lobby is no longer appropriate for gathering; rather, it is a place to proceed through.
<b>4. Place safe activities in unsafe locations.</b>	Entrances and exits should be strategically lit.
<b>5. Place unsafe activities in safe locations.</b>	N/A
<b>6. Redesignate the use of space to provide natural barriers.</b>	N/A
<b>7. Improve scheduling of space.</b>	N/A
<b>8. Redesign or revamp space to increase the perception of natural surveillance.</b>	Transparency at the ground level and orienting buildings outward will increase natural surveillance.
<b>9. Overcome distance and isolation.</b>	Windows at the ground level will help to create interaction between inside and outside uses, allowing for mutual surveillance.
<b>10. Ensure maintenance at the site.</b>	Security cameras will aid in indicating when something is in need of repair.

As described in this section, the goals of CPTED are to increase natural surveillance, territoriality, activity support, maintenance, and access control. These can be achieved by implementing ten principles at each urban scale. In Chapter 5, I will use the analysis from this segment as well as “Antiterrorism Design in Action” in order to examine the synergies and discontinuities between CPTED and antiterrorism design.



EXHIBIT  
ANTITERRORISM DESIGN AND CPTED: SYNERGIES AND DISCREPANCIES

In the following pages you will find a chart of elements and strategies as described in the proceeding chapters. The chart provides guidance as to whether each identified strategy or element can be compatible with both Antiterrorism Design and CPTED, and to what degree. In general, most strategies and design elements are complementary, and the way they are used on a site can be directed to simultaneously achieve the goals of each. However, a few design elements and strategies are fundamentally incompatible unless dramatically retrofitted or redesigned. These are of particular interest, as they highlight that while ATD and CPTED can be complementary, this will not always be the case.

Table 9. Chart of CPTED and AT design elements and strategies

Element	Description	CPTED purpose	AT purpose	Interaction /Optimization
<b>Bollard</b>	Singular element that can be grouped to form a kind of fence that is permeable to pedestrians and cyclists. Initially used at wharves as poles to tie boats to	symbolic barrier allowing for visual permeability (preserving sight lines) to define a zone of influence in a hierarchy of transitional spaces, protects pedestrians from cars. Bollard type can show neighborhood ownership.	Provides a degree of perimeter security that can be reinforced to achieve a K-rating that increases effective standoff distance	Place K-rated bollards along transitional zones. Select a bollard style that enhances neighborhood aesthetic.
<b>Planter</b>	Element (usually rectangular or circular) that acts like a very large flower box or pot	“” also provides an opportunity to show ownership, community maintenance, and neighborhood identity through accompanying plantings	“”	Place K-rated planters along transitional zones, and ensure that plantings are maintained and reflective of the neighborhood character.
<b>Fence</b>	Continuous thin screen wrapped around a site (or portion thereof)	“” Visual permeability dependent upon type of fence	Can be reinforced with electric current and underground concrete to increase standoff distance	Use fences sparingly—they are not as stable as bollards and planters, and impassibility can create perverse incentives to trespass.
<b>Moat</b>	Artificially-created circular chasm surrounding site. May or may not have water.	“” if ‘traditional,’ provides water feature as incentive for increased activity	Increases standoff distance	Use moat and water feature to define a zone of influence. Caution that the moat does not become a movement

				predictor.
<b>Grade change</b>	Change in level of ground, ha-ha included	symbolic barrier allowing for visual permeability to define a zone of influence in a hierarchy of transitional spaces	Could prevent direct access to a site, increasing a potential bomb blast radius	Caution to preserve sight lines, otherwise has potential as a good element.
<b>Tiger Trap</b>	A collapsible sidewalk with a pit beneath and reinforced holding chamber	-	Provides security by way of trapping terrorists in cars or trucks.	Tiger trap does not interfere with CPTED elements, affords AT protection.
<b>Hardened lobby</b>	Screening process in building lobby that may involve turnstiles and a sign-in desk.	Real barrier to define a private zone, screens for individuals who are not supposed to be there	Screen for terrorists	As long as the screening process is not overly threatening, hardened lobbies are compatible with both ATD and CPTED.
<b>Movement Predictor</b>	Funnels pedestrians along a specific linear route	Poor design that must be changed.	Good, it ensures people are moving the desired direction. People who do not follow are threats.	<u>DIVERGENCE</u>
<b>Target Hardening/ Fortressing</b>	Securing the outside of a building in a visual way so as to indicate the presence of threat prevention technologies	Debated whether this is akin to CPTED or only tangentially related. More recent texts disparage target hardening in favor of more 'natural' techniques and less posturing. Thought to taunt offenders.	Preferable. Any degree of visual indication of increased security will act as a deterrent to terrorist groups, which will want to use limited resources in the most effective way (i.e. pursuing a target that will certainly be impacted)	<u>DIVERGENCE</u>
<b>Building orientation</b>	How building is positioned in relation to the street	Building should face the street to created maximum opportunity for natural surveillance	Building should be oriented inward (especially in circumstances without sufficient setbacks) to avoid attacks from the direction of street	<u>DIVERGENCE</u>
<b>Windows</b>	How many	Windows should	Limit the number	<u>DIVERGENCE</u>

	windows, where	be placed as frequently as is aesthetically pleasing so as to create maximum opportunity for natural surveillance. Windows at street level especially important for urban buildings to support sight lines and create inviting pedestrian through-ways	of windows of each building and remove windows at street level. Windows are less structurally sound than solid wall, and are more likely to burst in an explosion.	
<b>Sidewalk width increase</b>	Increasing the width of the sidewalk	Creates a more inviting street environment for more pedestrian action	Increases setback distance	Increase sidewalk width where possible.
<b>Active barriers for alleys and other enclosure areas</b>	Retractable bollards, fences, other active barriers in front of alleyways and enclosure areas	Provides a way to improve scheduling of spaces—entrapment areas should be closed at night and made unattractive to pedestrians	Closing alleyways to all but pre-screened deliveries increases setback distance in alleyways where buildings are always immediately next to the street	Install active barriers in entrapment areas and alleyways.
<b>High planters flush against building side</b>	Planter immediately next to building, waist-height or taller	While it provides a delineation of public and semi-public space, it removes the ability to see in and out of the lower levels of the building, removing another layer of surveillance.	The higher the better, acts as a blast deflector and increases setback distance.	<b>Some divergence.</b> A compromise involves medium-height barriers that provide amenities to encourage public interaction with space. Ornate benches or medium-height planters immediately below windows.
<b>Plazas</b>	Open areas between the building and the sidewalk	Plazas can be detrimental to CPTED if poorly maintained and accessorized, but if outfitted well can be assets that serve	Increases setback.	Ensure that plazas are maintained and they will be an asset to CPTED and ATD.

			to attract people and increase natural surveillance and better delineate between public and private space.	
<b>Control Booth</b>	Used to screen visitors either at the entrance to the site or in the lobby		Used to screen visitors to intimidate and identify possible aggressors	The 'hardened lobby' of the parking garage. This is compatible with both design aesthetics so long as it is not too threatening.
<b>Signage</b>	Including wayfinding, area delineation, or specific directions (i.e. parking control, restriction, designation)	Wayfinding is exceptionally important for CPTED, as is clear identification of areas for certain activities.	Clear identification of behavior acceptable in specific areas allows for easier screening of people in the area and identification of potential terrorists or aggressors	Signage should be promoted.
<b>Limited entryways</b>	Allowing only one entrance and exit so as to screen building users	One entrance is acceptable, but blocking exits is impermissible due to fire safety or other issues.	Preferable to better screen for terrorists.	Allow for limited entryways but multiple exits.
<b>Security Zones</b>	No Man's lands around important buildings	Impermissible. Removes eyes from the street, flirts with Shlomo Angel's critical densities.	Good. Enhances setback and the fewer people the better.	<b>DIVERGENCE</b>



**PART II**  
**REALITIES AND RECOMMENDATIONS**



## CHAPTER 5

### BOSTON AND NEW YORK: ON LOCATION

In this chapter, actual antiterrorism design and CPTED processes will be analyzed in two urban environments: New York and Boston. This chapter will explore the government agencies, documents, and historical motivations of both design paradigms in these cities. There are a number of reasons why these two cities were selected as case studies for this research.

Both New York and Boston are major centers of economic and historic importance on the Northeastern coast of the United States. Both are noted tourist hubs with celebrated downtowns, and both were scrutinized following the terrorist attacks on September 11, 2001. Additionally, these cities were chosen as a result of my previous knowledge resulting from work with M.I.T. Lecturer in urban design and planning, Susan Silberberg-Robinson, whose research focused on changes in public space post-9/11.

The information-gathering process for this chapter was enlightening. The original intention of this thesis research was to provide insight into site design decision-making processes of various public and private building owners in New York and Boston. However, it quickly became apparent that discussing even visible site security elements was problematic. In an attempt to retrieve information about one federal building in Boston, the building manager answered a few questions, then abruptly ended the conversation, saying “I can’t speak with you about this.” Attempts to continue the conversation were met with a request that I speak with someone ‘higher up,’ who did not return my phone calls. It should be noted that it was not my intention to ask questions about anything but immediately visible security interventions. Nor did I ask specifics regarding K-ratings or threat assessments. The experience illuminated the challenges of researching urban security interventions, and informed my choice to focus instead upon city policy and process.

#### NEW YORK AND BOSTON: EXCEPTIONALLY BRIEF INTRODUCTIONS



Figure 15. Map showing location of Boston and NYC. Created by the author.

Boston was established as a town in 1630, and was the setting for the Boston Massacre and the Boston Tea Party. It was also the place where George Washington first took command of troops at the onset of the American Revolutionary War (City of Boston 2010). As a result, one of Boston’s many nicknames is “The Cradle

of Liberty.” As history progressed and Boston continued to grow economically and academically powerful, it became known as “The Hub of the Universe” (Dalager 2010). Boston is now home to over 600,000 people (U.S. Census Bureau American Community Survey 2006-2008), over 35 universities (BostonEducation.org 2006), and more than 20 hospitals and medical centers (Capuano 2010). It is estimated that the city hosts over twelve million national and international visitors each year (City of Boston 2010). Boston’s most modern moniker is “The Walking City,” which is a tribute to the proximity of neighborhoods, safety of the city streets, and quality of Boston’s public space (Dalager 2010). Celebrated public spaces include Boston Common, the Public Garden, and Post Office Square.

New York City, originally New Amsterdam, was established by the Dutch West India Company five years before Boston, in 1625 (New York Times Editorial Board 2008). As early as 1800, New York City became a place for diverse immigrant groups to settle, and in 1892 Ellis Island was officially designated as the location where all new arrivals would be processed (National Park Service 2008). Another New York landmark, the Statue of Liberty, was erected six years later (National Park Service 2010). New York City grew quickly to become the premiere American cultural and financial city. Today, New York City is home to over eight million people (U.S. Census Bureau American Community Survey 2006-2008), countless entertainment and cultural institutions, and a world-renowned financial center. Perhaps equally well known are the city’s public spaces and bustling city streets. Famous public spaces include Central Park, Times Square, and the New York Public Library. Over twenty-six million people visit New York City annually (Project for Public Spaces 2003).

## **HISTORY OF TERRORIST ACTIVITY**

As a result of New York City’s prominent position on the national stage, as well as its myriad cultural and economic landmarks, it has become a target of terrorist attacks. While Boston is also historically and culturally significant, it has fewer landmarks, is less densely populated, and has not been a target of any successful attack. The history of terrorism in New York and Boston is instructive, and helps to explain the divergent antiterrorism design processes of the two cities.

As mentioned in the antiterrorism design history chapter, in 1910, New York City’s Wall Street was the site of one of the first terrorist attacks in U.S. history. Between 1910 and 1950 there were extremely isolated incidents of terrorism, and in the 1950s Washington, D.C. became the locus of terrorist interest. It was not until the 1970s that New York was threatened again, and Boston threatened for the first time.

In 1974 American cities began to receive bomb threats. The first was a nuclear bomb threat from an unidentified party in Boston, and the second was from a seemingly well-informed group in New York City. The threats, which both turned out to be hoaxes, asked for various sums of money from the U.S.

government. A year later, many militant groups associated with the Palestinian movement began to exhibit hostile tendencies. A bomb exploded at New York's La Guardia Airport in Queens, NY. A caller took responsibility for the attack in the name of the Palestinian Liberation Operation (PLO); however, the PLO denied association. The next year, in 1976, Croat nationals placed a bomb in Grand Central Terminal in New York City. The NYC Police Department (NYPD) was unable to disarm the bomb in time, and one officer died. Additionally, during this period, the FALN, Puerto Rican National Liberation Armed Forces, set off bombs in Manhattan (Naftali 2005).

On February 26, 1993, the World Trade Center (WTC) in New York City was attacked for the first time when a bomb exploded in the public parking lot beneath the building. Six people died, a thousand suffered injuries mostly due to smoke inhalation, and the WTC was left with over \$500 million in property damages (Anti-Defamation League 2005). A Pakistani terrorist cell took responsibility for the attack.

The World Trade Center was attacked for a second time on September 11, 2001, when two planes flew into its Twin Towers. It is estimated that roughly 3,000 people died in the 9/11 attacks; these casualties include plane passengers, Pentagon, and WTC victims. At the World Trade Center, there were 2,152 civilian casualties (National Commission on Terrorist Attacks Upon the United States 2004), 60 police officer, and 343 fire fighter deaths (America.gov 2006). The attacks of September 11<sup>th</sup> are the most heinous terrorist acts in United States history.

Since the events of September 11th, New York City has received multiple terrorism threats and ongoing intelligence about potential threats. Most recently, on May 1, 2010, a car bomb planted by a naturalized American citizen allegedly working under the direction of the Pakistani Taliban failed to detonate in Times Square (The Associated Press 2010). The attempt was unraveled swiftly by officials, and has fueled renewed public interest in counterterrorism and antiterrorism strategies.

Boston has not experienced any successful terrorist attacks; however, there was widespread panic over a television publicity stunt initially believed to be a series of bombs. Adult Swim, a program on a television channel owned by Turner Broadcasting, launched a guerilla marketing campaign for one of its shows. The campaign involved a character made of LEDs gesturing with its middle finger. In late January, 2007, the display was implemented 400 times in each of ten major U.S. cities. According to one article,

While other cities took little notice, some residents of Boston mistook the batteries and wires protruding from the devices for explosives and notified authorities. The city quickly shut down major transportation corridors and spent close to \$500,000 deploying police and bomb-sniffing dogs. Turner Broadcasting took responsibility for the stunt, issuing an apology and paying \$1 million to the city and \$1 million in "good will" funds towards homeland security (MacMillan and Walters 2007).

While the incident was embarrassing to the city, it is possible that the ‘terror drill’ was invaluable.

As a result of divergent experiences dealing with and responding to local terrorist activity, New York City and Boston have responded in very different ways to real and perceived threats. Below, various facets of response in both cities will be explored, including design awareness and intervention, the role of public and private actors, and the levels of education and coordination achieved in both cities.

## **PLAYERS AND PROCESSES**

### *New York*

In New York City, when antiterrorism interventions are proposed that will intrude on the public realm, they are sent through a revocable consent process. Both privately and publicly- financed projects must undergo the revocable consent procedure. A property manager must begin this review process by submitting the proposed antiterrorism design to the Department of Transportation. Once the DOT reviews the intervention, it is sent to the NYPD, the Fire Department (FDNY), the Department of Buildings, the Department of City Planning, and the Design Commission. If the project has a subsurface element, then it also must be reviewed by the New York City Department of Environmental Protection and the Metropolitan Transportation Authority. Finally, if the intervention is to be a part of a New York City Historic District, it must be presented to the New York City Landmarks Preservation Commission (New York Police Department Counterterrorism Bureau 2009, 34). According to one New York City source, some might think the revocable consent process to be long and tedious, since each agency has its own priorities. An example of the challenges presented by multiple agency review can be found in the attitude toward bollards. The design commission dictates that bollards should be no higher than thirty inches, since people are accustomed to obstructions placed at waist-height (like desks). NYPD, by contrast, is more concerned about evolving threats and protection, even at the cost of design. The agencies must arrive at a compromise between their priorities, allowing for a very physical compromise to the philosophical contentions of security in a democratic society.

Even antiterrorism design projects undertaken by private owners that do not intrude upon the public realm tend to have some public agency involvement in New York City. NYPD SHIELD provides the public-private interface to work as security consultants on private projects. The NYPD Counterterrorism Division Threat Reduction and Infrastructure Protection Section conducts vulnerability assessments for buildings as requested by private owners. Vulnerability assessments take months to complete and produce detailed observations about the site and the building in question. In order to

produce these assessments, the Threat Reduction/Infrastructure Protection officers have numerous meetings with other agencies and stakeholders (New York City Police Department 2010).

After this threat assessment process is completed, private businesses are under no obligation to accept the advice of the NYPD and implement the suggested level of security measures. There is also a belief by security officials and professions that building owners are more likely to underestimate the level of threat against them. However, these same people concede that threat level is largely subjective, and that different analysts tend to assess levels differently.

Suffice to say, most city agencies in New York have a stake in antiterrorism design. Boston presents quite a different story.

## ON LOCATION: OVERZEALOUS BOLLARD INSTALLATIONS

“Monotonous repetition of a single element should be avoided. Block after block of the same element, no matter how attractive, does not create good design. When a continuous line of bollards approaches 100 feet, they should be interspersed with other streetscape elements, such as hardened benches, planters, or trees (Federal Emergency Management Agency 2007, 132).”

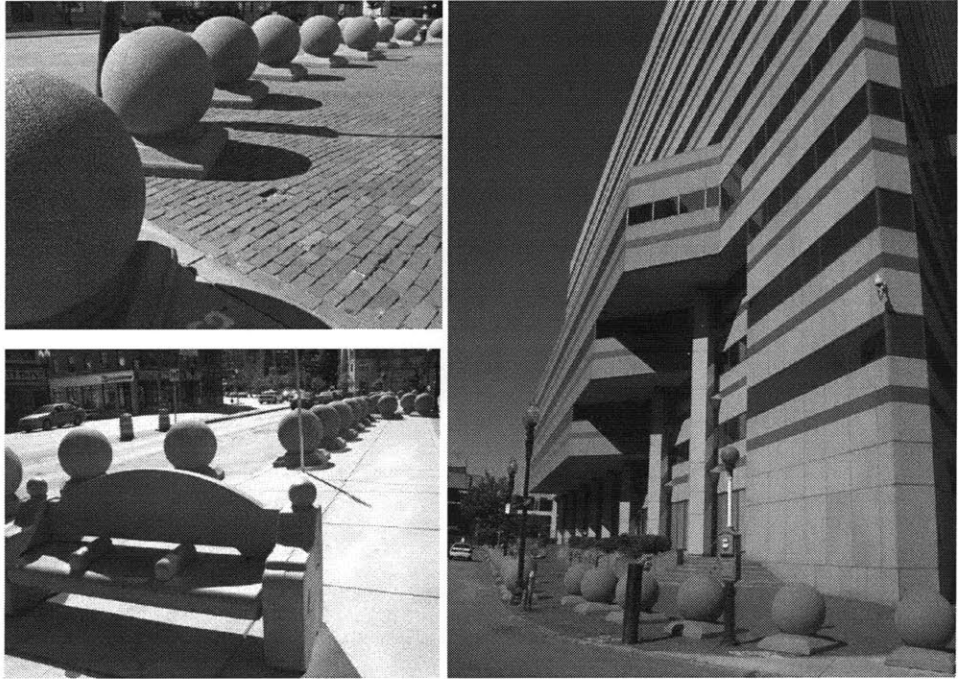


Figure 16. Photographs by Sara Rothrock.

Over 400 feet in front of the Thomas ‘Tip’ O’Neil Building in Boston (from Causeway St & Lomasney Way to past Causeway St & Portland Street) are protected by bulbous bollards.

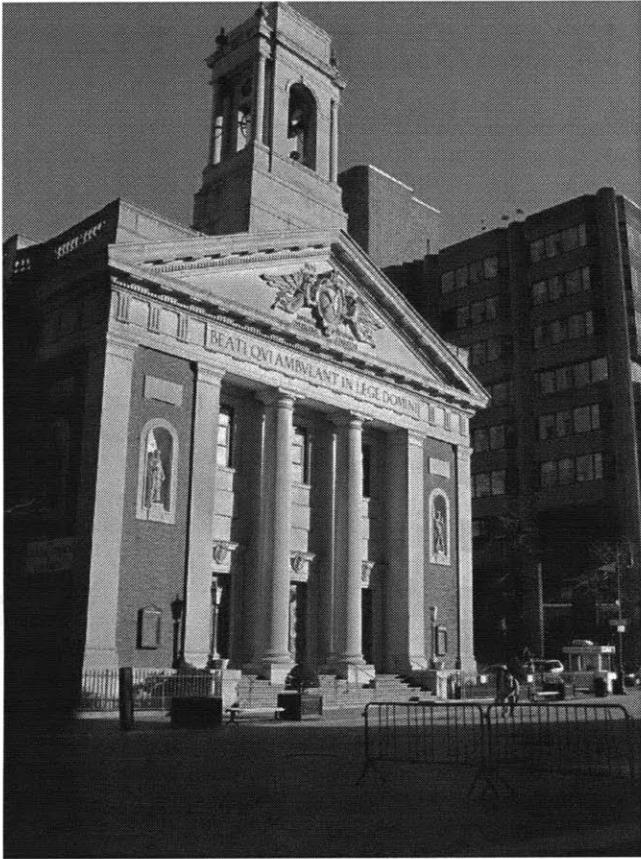
The perimeter of the site of the Jacob K. Javitz building in New York City (on the corner of Worth & Lafayette Streets) is entirely surrounded by squat black bollards.



Figure 17. Photographs by Sara Rothrock.



ON LOCATION: TEMPORARY ANTITERRORISM DESIGN, OR LINGERING CPTED-ORIENTED TERRITORIAL DELINEATION?



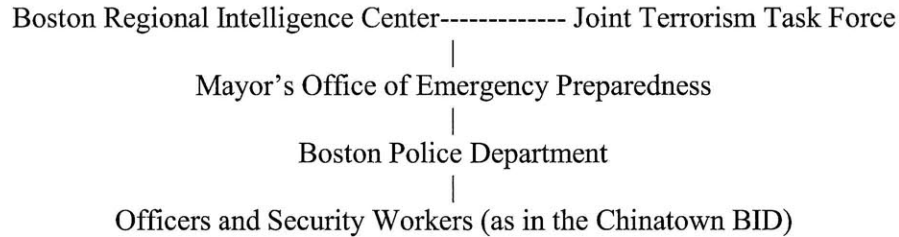
In these pictures, temporary fences (known derisively as ‘bike racks’ to some in the security industry), seem placed almost at random near and around landmarks. To the left, New York City’s St. Andrew’s Roman Catholic Church. Below, pictures of fences around Boston’s City Hall.

Figure 18. Photographs by Sara Rothrock.



*Boston*

It is obvious that Boston has publicly allocated resources and is capable of handling terrorist threats. The chain of command for counterterrorism strategy in the city is as follows:



However, the city does not have a public grasp on antiterrorism design. There appears to be no



Figure 19. Bank of Boston/Bank of America Headquarters. Photograph by the author.

agency providing oversight to public antiterrorism design interventions and no revocable consent process. The GSA guidelines are clearly at work for government buildings, but the design is generally utilitarian and violates basic design principles that encourage pedestrian engagement at the site and sidewalk level. As such, suggestions contained in FEMA 430 seem to have made little impact. Antiterrorism design at sites runs the gambit from starkly confusing (repetitive bollards of the Tip O'Neill building, as pictured previously) to



Figure 20. Attractive metal gates block access to alternative entrances to the State House, as well as the statue of John F. Kennedy. Photograph by the author.

appealing (such as the sitting area created at Boston's Bank of American headquarters), to obtrusively temporary, to undesirably restrictive (as in the case of the State House). Though these site conditions can similarly be found in New York City, Boston appears to lack of formal process with which to deal with these issues and interventions. In short, the antiterrorism design interventions in Boston not only began as ad-hoc, but have continued that way almost ten years later. There is no advisory body or public consulting mechanism as with the NYPD.

The agency best-positioned to conduct antiterrorism design critiques in Boston is the Boston Civic Design Commission (BCDC). Unfortunately, the Design Commission is not given the power to review building retrofits, only new

projects. When it is called to approve certain high-security projects, its role is mainly ceremonial. The BCDC is, however, able to make comments on lobbies in the city. Also, according to David Carlson, Senior Architect with the Boston Redevelopment Authority and Executive Director of the Commission, there is a movement to make security retrofits in the city more understated. The BCDC attempts to ensure that barriers are constructed in a way so that they are not intimidating to the public. The Commission is interested in engaging pedestrians with the sidewalk by encouraging transparency at ground level. According to Director Carlson, the BCDC does not orient its judgment of design interventions with suggestions from FEMA documents; rather, it uses urban design principles to inform a conversation of what would work best in any particular environment. Interaction with private security consultants occurs mainly when the commission is advocating for through-block access (Carlson 2010).

### **LOCAL ANTITERRORISM DESIGN DOCUMENTS**

As it does not have a specific design protocol, Boston does not have a city-specific design document. New York, however, has produced two informative works. The first, *Designing for Security*, was created by what was Art Commission of the City of New York and the Design Trust for Public Space in the spring of 2002 (Russell, et al. 2002). The second, *Engineering Security*, was created in the summer of 2009 (New York Police Department Counterterrorism Bureau 2009).

The research for *Designing for Security* was commissioned in 1997. Even then, before the events and ad hoc interventions of the post-9/11 city, a post-Oklahoma City bombing thoughtfulness emerged. In the opening pages of the document, the writers assert,

We believe that the thoughtful assimilation of security theory and techniques — for example, surveillance and defensible space — will mitigate future needs for fortress-like construction to achieve reasonable security goals (Russell, et al. 2002).

The document briefly walks readers through the ways in which design influences behavior, and some of the leading place-based crime prevention strategies. The remainder of the document educates the reader as to how the public can take ownership of projects, how certain categories of design interventions function (barriers, thresholds, and circulation), and how art can be more thoughtfully integrated into security projects. Examples of projects are interspersed throughout the document to provide readers with inspiration.

In *Engineering Security*, the NYPD provides information on creating buildings and building sites that withstand or thwart traditional terrorist attacks, and, in the event of their failure to do so, evacuate people and then fall apart in the safest way possible. The document familiarizes readers with threat analyses, standoff recommendations, and the revocable consent process. Additionally, it begins a design

conversation, indicating that Jersey barriers and concrete planters are not meant to be long-term solutions, and that some perimeter security measures could prove difficult to navigate for people with disabilities and can disrupt foot traffic. The document advocates that there should be a thorough vehicle threat vector analysis conducted before invasive design is considered.

With the exception of a discussion of local processes and the exclusive use of pictures from New York City, the document seems largely a repeat of the FEMA and GSA guidelines. However, unlike the GSA guidelines, private owners are strongly recommended to follow the suggestions contained within the pages; and, since the document was created specifically for New York, private owners have greater incentive to follow the suggestions. According to an unnamed source, Engineering Security grew out of the previously informal consulting service the NYPD provided for private developers post-9/11. After the consulting service became more popular, the NYPD worked with developers to create Engineering Security as a guiding document. The work was peer-reviewed and truly collaborative. Though it was spearheaded by the NYPD, it was contributed to by a few of the larger developers in New York City. These developers and design firms include Thorton Tomasetti, AECOM, Applied Research Associates, Inc., Severud Associates, Venter & Santore, Rogers Marvel Architects, and Weidlinger Associates, Inc. Advisers from the National Capital Planning Commission and Rutgers University were also consulted (New York Police Department Counterterrorism Bureau 2009).

In conclusion, New York City's public sector has a much larger influence over crime prevention design and antiterrorism design than does Boston. This is likely a result of the history of the cities. New York has a history of terror attacks, while Boston does not. As a result of New York's intimate experience of terror events and analysis of its own reaction, it has created both guiding documents and specific design procedures.

Now that antiterrorism processes have been explored, CPTED policies must be addressed. As with antiterrorism design, New York and Boston have divergent approaches.

## **CPTED**

Both New York and Boston have a history of employing place-based crime prevention strategies. As described in a previous chapter, Oscar Newman's theories of defensible space began when he was awarded funding to research public housing in New York City. Both New York and Boston eventually employed Newman's strategies in their public housing. Though New York was first, Boston followed eagerly. In *Reclaiming Public Housing*, author Lawrence Vale articulates Boston's embrace of defensible space in the redesign of three of its housing projects (Vale 2002). Modern iterations of CPTED and

place-based crime prevention design strategies will be reviewed later in this chapter. Suffice to say, historically, both cities had experienced problematic public housing projects, New York and Boston had similar attitudes toward the use of Newman's defensible space theories.

While it is clear that defensible space was pursued with regard to public housing, it is more difficult to follow the thread of place-based crime prevention tactics as they translate to policies and strategies for modern downtowns.

### *Boston*

Boston has no formalized crime prevention design assessments. CPTED policies are not used in any formal context, but some general ideas (like ensuring visual permeability) have been employed when looking at potential issues in certain city parks. In general, the Boston police are not normally consulted about design strategies for private or public projects, and has no coordination with the Boston Redevelopment Authority or the Boston Civic Design Commission. However, the police department does respond to the threat of terrorism. In particular, the BPD plays a key role in managing the transport of hazardous materials safely through Boston's city streets.

### *New York*

New York City has a dedicated Crime Prevention Unit that gives free security surveys to private building owners. Not only that, but the unit's Special Projects team is routinely requested to participate in Value Engineering Studies and Risk Assessments for City construction projects. CPTED (Crime Prevention Through Environmental Design) principles are applied early on in the design of these projects. This team has also been increasingly called upon to conduct surveys relative to highly sensitive security issues at all levels of government (New York Police Department 2010).

A call to the Crime Prevention Unit confirmed that the team knows its way around a security survey and CPTED. Deputy Inspector Michael Nemoyten spoke with me about preserving sightlines and how design considerations are taken very seriously in planning for a new NYPD training facility (Nemoyten 2010). A conversation with Sergeant Stephen Carolan of the unit was even more enlightening—the NYPD has been integrating CPTED into its security surveys for approximately the last ten years. Elaborating, Carolan stated that it's not “spelled out” in the security assessment provided to property owners, but the principles are all there. He lamented that people call the NYPD to look at design as an afterthought, begrudgingly admitting that sometimes all that's possible is target hardening. He related one instance where the NYPD was brought to do a security assessment on a high-rise next to a five-storey condominium. “The roof of the condo was accessible to the tenement buildings. The only thing to do was to put bars on the window, which we don't like to do, because it makes people think that there's criminal

activity” (interview). When asked how often they were invited into the design process on new buildings, the Sergeant revealed that “There are times we look at blueprints, but not as often as we’d like. Mostly consultants are brought in to give advice. As an afterthought they call us.” If the NYPD is called for a security survey, it is usually by the building manager (Carolan 2010).

New York City seems to have a good grasp on CPTED and its implications. Prior to the events of September 11th, the Crime Prevention Unit used to look at and give advice regarding threat assessments, but this task now falls to the counterterrorism unit, as explained above.

There is evidence from academic sources pointing to the use of defensible space and CPTED principles in New York City. According to one article, “at the New York Port Authority Bus Terminal 63 specific design interventions (including access control, cleaning and enhancing formal surveillance by staff) significantly reduced robberies and assaults” (Cozens, Saville and Hillier 2005). Less detailed accounts of success similarly suggest that New York City has made use of CPTED principles in its planning, policing, and revitalizing strategies.

## **STATISTICS**

A discussion on CPTED would be incomplete without at least a brief analysis of relevant crime statistics. The statistics found below are associated with the Boston Police Department’s District 1 (which includes Boston’s Government Center and Financial District—roughly, its downtown) and the territory of Lower Manhattan’s Downtown Alliance. According to their website, the Downtown Alliance “manages the Downtown-Lower Manhattan Business Improvement District (BID), serving an area roughly from City Hall to the Battery, from the East River to West Street” (Downtown Alliance 2010). The maps showing approximate extents of both District 1 and the Downtown Alliance BID are at the same scale.



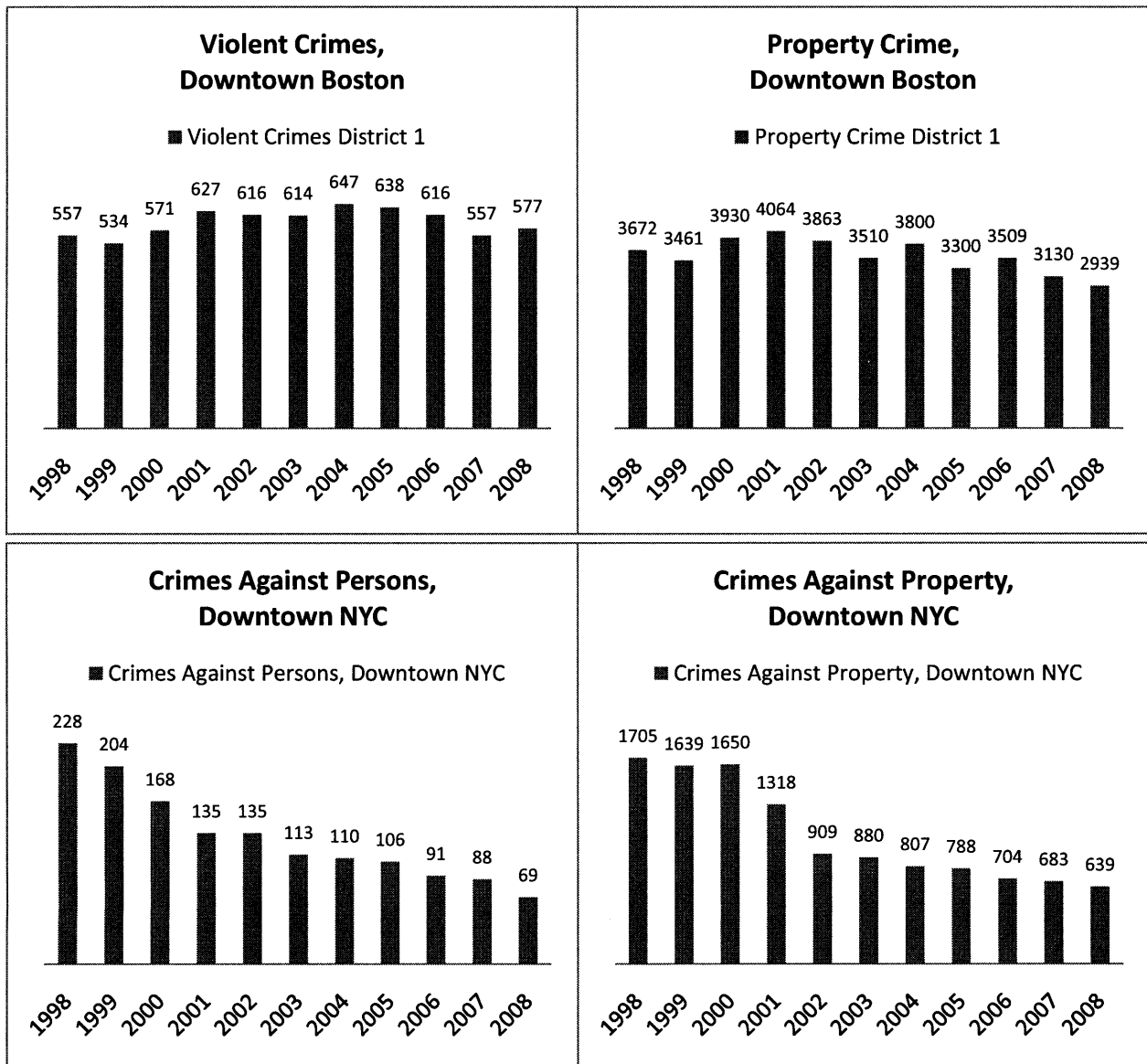
Figure 21. At left: approximate extent of District 1 of the Boston Police Department (Boston's downtown). At right: approximate extent of the Downtown Alliance's BID, which, like District 1, includes New York City's financial and government district. Maps created by author, using ESRI's ArcMap and data provided by the Massachusetts Institute of Technology.

It is important to note that the area patrolled by the Downtown Alliance in New York City and the area in Boston known as District A1 are not the same in size. District A1 is roughly 1.5 times the size of the Downtown Alliance area. However, both District A1 and the Downtown Alliance areas contain what are considered the 'downtowns' of both cities. Both downtowns encompass a financial district and a government district.

Below are bar graphs showing the number of crimes against persons and crimes against property in downtown New York City and downtown Boston. The numbers exist as reference points, but they are not immediately necessary—the interesting comparison here is general trends in the numbers. The Boston statistics are from the Boston Police Department, and the New York statistics are from the Downtown Alliance.<sup>1</sup>

<sup>1</sup> Boston provided the number of crimes in the district. The Downtown Alliance, however, is part of one NYPD precinct, and so pulls its own numbers from a larger list. Instead of providing the number of crimes each year, the Downtown Alliance finds it more meaningful to represent its statistics by calculating how many days must progress before one crime occurs. For example, a rating of 0.2 means that, on average, five days had to pass in that year before one crime was committed. For the sake of more immediately comparable numbers, the statistics have been reverse-calculated to what an approximate of the original statistic might have been.





With the exception of violent crimes in downtown Boston, it seems that all crime has been decreasing since the earliest years in these graphs. The change in property crimes in downtown New York City beginning in 2001 is particularly marked. There could be a number of reasons for the downward trend in crimes, including increased police vigilance or presence in an area (likely), dramatic errors or changes in reporting crimes (unlikely), or fewer people to commit crimes against (likely in NYC immediately after 9/11). It is possible that so much property crime occurred at the World Trade Center that its decimation accounted for some of the statistical change. While this was almost certainly a contributing factor, I believe that antiterrorism interventions, and particularly lobby hardening, have much to do with the decrease in property crimes downtown.



Property crimes are more likely than violent crimes to be influenced by antiterrorism design and lobby hardening. This is because property crimes are more often crimes of opportunity than crimes of violence (which are more likely to have some forethought involved). Hardened lobbies, increased police vigilance, and the presence of CCTV are likely to decrease opportunities for property crime. According to one source, prior to lobby hardening in downtown Boston, there used to be much more larceny in office buildings. Thieves could enter buildings dressed as office workers and steal laptops and wallets. It is interesting to note, however, that the number of car break-ins since has escalated, and displacement is the likely cause.

In New York City, the numbers (and the stories) are similar. Sergeant Stephen Carolan of the New York Police Department's Crime Prevention Unit asserted that "the crime in New York is way down," but that larceny is still a problem. He continued, "if there's someone who wants to rob a house as their livelihood, and they can't get into the house, they're going to find other ways to support their livelihood... You're not going to reform, you're going to displace" (Carolan 2010).

## **CONCLUSION**

Research in New York City and Boston reveals important issues. First and foremost, this research illustrates that it can be difficult to obtain any information regarding antiterrorism interventions. While this fact is credible to a point, information from public entities regarding interventions that are readily visible should not be so difficult to obtain. Rather than having to do with security issues, this reaction is purely about fear. There is so little discussion about antiterrorism in general that the mere mention of it seems to send some individuals up in arms.

Second, New York City has a clear public process of public realm antiterrorism design vetting, while Boston does not. Similarly, New York City has a public agency (the NYPD) available to provide threat assessments for both public and private properties, while Boston does not. New York City's 'open and available' approach to antiterrorism design is likely the result of meeting a public demand for these services, which Boston most likely does not have (at least not at the same volume). Public demand for services is likely a result of the history of terrorist activity in New York City and the larger size of the city.

Third, property crimes have decreased in both Boston and New York from 1998-2008. While it is likely that this decrease is the result of several factors, one factor is undoubtedly the implementation of antiterrorism interventions. This hypothesis that antiterrorism interventions in general (and lobby hardening and CCTV in particular) aided in the drop of more prosaic day-to-day crimes in urban downtowns was informally supported by contacts at both the New York and Boston police departments.

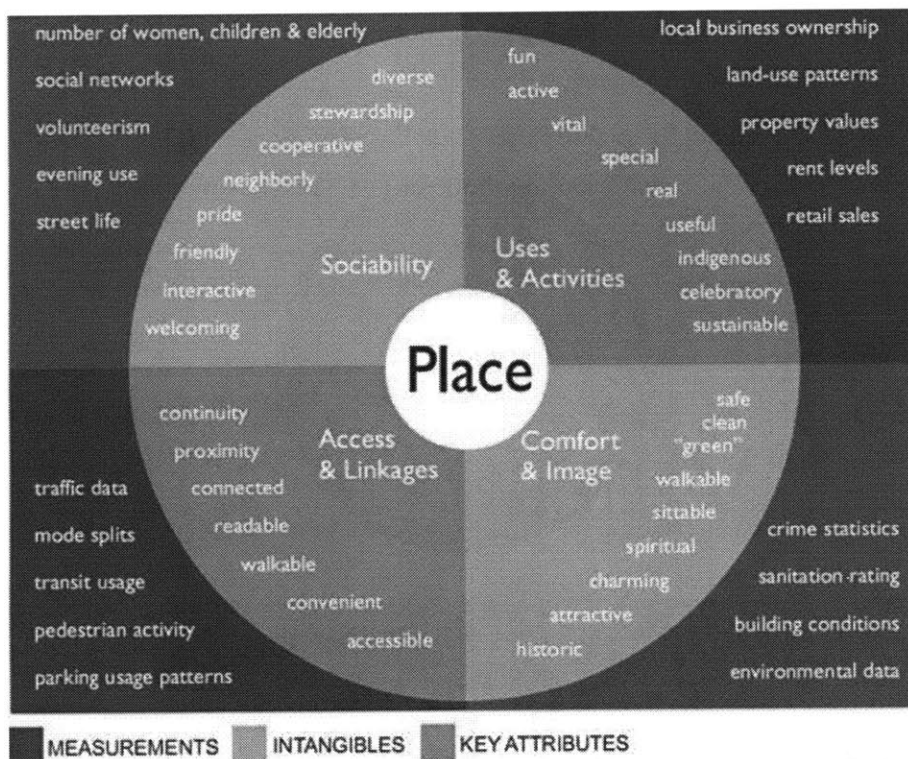
The next chapter will explore Civic Design, another design paradigm vital to creating not only a vibrant downtown, but a healthy public realm. The basic principles of designing for good public spaces are reviewed. Additionally, five basic tenets of Civic Design are proposed.

CHAPTER 6  
THE PUBLIC REALM AND CIVIC DESIGN

It is clear that the richness of urban public space in Boston and New York City is created by something other than innovative ATD and adherence to CPTED. ATD may protect buildings from terrorist attack, and CPTED will optimize the safety and security of a public place through design strategies, but even the combination of both will only go so far to promote a vibrant public realm. What is truly necessary is a humanizing framework for these security strategies and interventions. Civic Design is just such a framework.

As suggested in the Introduction, and, indeed, throughout this thesis, a vibrant public realm is key to the success of both Boston and New York as cities of national and international acclaim. A vibrant public realm relies upon the degree to which urban public spaces adhere to the myriad principles of good public space design. Many urban designers, theorists and public space advocates have contributed to the collective understanding of what constitutes good public space. William H. Whyte focused on the physical qualities of good public space. Kevin Lynch looked at both physical and theoretical qualities, asking questions about presence, use and action, appropriation, modification, and disposition (Lynch, *A Theory of Good City Form* 1981).

Project for Public Spaces, a nonprofit organization in New York City, is the champion of great



public realm design. It makes it its business to assess the quality of public spaces and define the qualities of good spaces. Project for Public Spaces comprehensively defines the elements that contribute to the creation of a space in the adjacent diagram:

The words in orange are the 'key' attributes that determine the quality of a space: sociability, uses and activities, comfort and activities, comfort these quadrants, a place may

Figure 22. Attributes of place, retrieved from www.pps.org

be more or less successful in terms of fulfilling its potential for becoming an icon of public space (Project for Public Spaces 2010).

Clearly, Project for Public Spaces has spent time compiling qualitative and quantitative data in order to create this diagram. In it are the influences of Kevin Lynch, Jane Jacobs, William H. Whyte, Shlomo Angel, and a myriad of other notable planners and theorists. This framework of criteria and considerations may be used as a benchmark against which all urban public spaces are measured. However, as suggested at the beginning of this section, it is not simply good public realm design that is necessary to create and sustain healthy public space. In particular, it is imperative that the tenets of good *Civic Design* are used to humanize Antiterrorism Design.

According to one author, “Civic Design is approaching how we use, plan, physically design, and support our communities and the public realm in a way that benefits citizens, citizenship, and the city” (Steiner 2006). Civic Design, then, differs from public realm design in that it is specifically crafted to benefit and even engage people with the larger civic environment. This is especially important to think about in relation to Antiterrorism Design. Ideally, Civic Design coupled with Antiterrorism Design must not only protect people, but also engage them with the intervention, encouraging them to understand the design and become a part of an enlightened citizenry to combat terror.

From a CPTED perspective, too, Civic Design is a goal to strive toward. In Chapter 3 of this thesis, the principles of second-wave CPTED were examined and defined as a movement of crime prevention through community building. Key interests involved neighborhood capacity, community culture, cohesion, and connectivity (Saville and Cleveland, An introduction to 2nd Generation CPTED 2003). A study of a Dutch CPTED plan revealed the importance of creating meeting places, human-scale development, and engaging residents. The Dutch plan was describing the positive outcomes when CPTED embraces Civic Design.

Civic Design is an overall goal of public realm design, and good Civic Design will share the same qualities of good public space design. Public realm design must support and enable Civic Design. Based on my research, I have developed a list of five basic Civic Design principles.

- Multi-lateral implementation
- Accessibility
- Safety
- Stewardship
- Education

All of these together will create projects that not only delight passersby, but that engage with people in the public realm.

## **MULTI-LATERAL IMPLEMENTATION**

The concept of “Civic Design” necessarily implies a multilateral design conception and implementation. Beautiful accessible spaces have been created unilaterally in the past. However, while these might be civic at end (by design), they are not truly civic unless created by multiple stakeholders. In John de Monchaux’s “Getting Things Done in Messy Cities,” the author wrote about the necessity of ‘messiness’ in cities, defining ‘messiness’ as a desirable quality of the urban environment that allows for complex relationships and serendipitous creation. He writes,

To think of cities as messy places will properly caution us against the use of exclusive, unidimensional, or egocentric actions. To respect the messiness of cities encourages the opportunity for pluralistic actions that not only will serve the very diverse interests of the city’s people, but in the end, I maintain, will give greater delight and reward (de Monchaux 1989).

This is the crux of Civic Design: for endeavors to be multilateral and interwoven. This strategy varies notably with the way that most ATD interventions are implemented. As demonstrated from attempts to speak with key players in ATD, the process and tools employed in Antiterrorism Design can be secretive and obscure to the community at large.

## **ACCESSIBILITY**

In order for a space to merit the description of being inspired by ‘Civic Design,’ it must also be accessible. Accessibility has two major attributes and a corollary. First, an accessible place must be easy to get to. This means that anyone can find it and get there. It is not hidden, it is not exclusive, and it is a space that meets the needs of all potential users, including the elderly and handicapped. Second, an accessible place must be perceived as ‘central,’ or ‘close to other things.’ If this is not the case, then the space does not reflect truly Civic Design. A beautiful park in a marginal space inaccessible to multiple groups of people is not an example of Civic Design. The corollary to accessibility is safety.

## **SAFETY**

A civic space must be perceived as safe and comfortable. These concepts directly refer back to the Project for Public Spaces diagram. Safety is a corollary of accessibility because it influences perception of access. If a place is not perceived of as safe or desirable to be in, then people will feel that it is inaccessible to them. The creation of a sense of safety in civic space harkens back to the discussion of the social contract in the introduction of this thesis. Since it is the responsibility for the government to make its people safe, it stands to reason that civic spaces—ones that respond to the citizen’s interaction

with the state—should also be safe. Safety can only truly be achieved, though, through some type of stewardship of the space.

## **STEWARDSHIP**

“Civic Design” could perhaps more accurately be called “civic-minded” design. According to the Merriam-Webster dictionary, to be civic-minded is to be “disposed to look after civic needs and interests” (Merriam-Webster 2002). Civic Design should inspire people to take part—through interacting with the space, maintaining it, and thereby defending it. A place with truly Civic Design will become important to the people who populate it. These people must provide advertising (through word of mouth), maintenance (through reporting damage to proper authorities or even through continued presence), and entertainment (by populating and thereby becoming actors) for the space. These people, directly or indirectly, must speak for the space. By speaking for civic spaces, people are speaking for themselves and for the myriad others who would benefit from the space. Consider the number of beloved spaces which have “Friends of” groups dedicated to them.

In cities that are made of corridors, patches, and nodes (to muddle Kevin Lynch and Richard Forman) of beloved civic spaces, it may be too much to ask that each plot become the beneficiary of such a group. However, the police are not enough. Citizens themselves must be called to action for their civic spaces. There must be a civic sense to compel them to try to understand and be on the alert for terrorism. This can be accomplished through education.

## **EDUCATION**

A corollary of stewardship, education is a cornerstone of Civic Design. The concept of ‘civic’ hinges on the idea of a multitude of people coming together to form one society. The society becomes more than the sum of its parts; however, if its parts are uninformed, society itself is uninformed. In the case of terrorism, this is a dangerous omission from public knowledge. A civic space, then, should somehow educate its users about their part in a greater picture. The space can be designed in a way that helps people to form questions. An excellent example of a company that understands Civic Design is Rogers Marvel, a design firm based in New York City.

In its design philosophy, Rogers Marvel declares that all ATD interventions should be amenities. Instead of considering mainly constraints (that buildings must be protected against terrorists), the firm thought in terms of opportunity. Rogers Marvel creates amenities to draw people (or, at the very least, to not push people away) and to intrigue them. Their security sculptures (No-Gos) help locals and tourists to

ask questions about presence and meaning of antiterrorism while drawing them nearer and asking them to interact.

## **CONCLUSION**

Although CPTED will optimize Antiterrorism Design in a way that will aid it to become less intrusive and more responsive to daily conditions, this optimization will not necessarily promote the creation of useful or beloved public space. CPTED must be used to optimize Antiterrorism Design, and Civic Design principles must be used to humanize Antiterrorism Design. These three design paradigms (ATD, CPTED, and Civic Design) must be used in tandem to help modernize the urban downtown and prevent it from losing all traditional character.

Civic Design is imperative to maintaining the vibrancy of the downtown public realm and the making the ATD process about knowledge rather than fear. An educated public is capable of defending itself. Without knowledge of what one is looking for, what good are eyes on the street?

The next chapter will use principles, findings, and research from this and earlier chapters to propose several recommendations for Boston and New York City. While these recommendations will be tailored specifically for the two cities, they are likely to be useful for any large city implementing antiterrorism interventions.





## CHAPTER 7

### OPTIMIZING ANTITERRORISM DESIGN: *RECOMMENDATIONS AND CONCLUSIONS*

In the previous chapters, it has been illustrated that, theoretically, ATD and CPTED are compatible. If this synergy is theoretically possible, designers, planners, and building owners must strive to achieve compatibility at all site levels. Achieving compatibility will optimize site safety and security, which is crucial to restoring a balance for safety concerns in urban downtowns, while supporting good urban design practice. While it is important (for some sites) to prepare for terrorist attack, it is equally important to pay attention to the safety of site visitors on a day-to-day basis. Preparing for terrorist attack but ignoring basic, daily safety concerns is like preparing for a lightning strike but failing to plan for rain. The worst case scenario must be considered, but daily conditions are just as, if not more, important. Worst case scenarios are anticipated in order to preserve daily function. But if daily function is impaired to begin with, there must be a balance in investment and interventions. By using site safety (CPTED) to optimize site security (ATD), and acknowledging the principles of civic design, urban areas can achieve a balance between the need for security and the need for the preservation of vibrant downtowns. This balance will be explored in this chapter.

The research in this thesis has consistently led to the same conclusion: CPTED and ATD design principles and goals are compatible. Deference to CPTED in antiterrorism design reports (specifically FEMA 426, 430, and Engineering Security) further strengthens this connection. The chart, found after Part I of this thesis, identifies places of compromise and the few areas of incongruity between ATD and CPTED design strategies. For the purpose of detailed discussion, I have created an abridged chart below, illustrated with the images of scale as seen in the ATD in Action and CPTED in Action chapters. Each image is associated with the scale it represents, and is followed by a list of design strategies or elements for ATD that are not compliant with CPTED. A second chart follows, showing the elements for CPTED that are not compliant with ATD.

**Table 10. Elements for ATD not compliant with CPTED**

<p><b>Scale of the downtown</b></p>	<p><b>Scale of the grid</b></p> <ul style="list-style-type: none"> <li>■ Movement Predictors</li> <li>■ Security Zones</li> </ul>	<p><b>Scale of the site</b></p>	<p><b>Scale of the building</b></p> <ul style="list-style-type: none"> <li>■ Fortressing</li> <li>■ Building oriented inward</li> <li>■ Removing windows at ground level</li> </ul>

**Table 11. Elements for CPTED not compliant with ATD**

<p><b>Scale of the downtown</b></p>	<p><b>Scale of the grid</b></p>	<p><b>Scale of the site</b></p>	<p><b>Scale of the building</b></p> <ul style="list-style-type: none"> <li>■ Building oriented outward</li> <li>■ Transparency at ground level</li> </ul>

Note that the discrepancies between the two design strategies fall within two scales: the scale of the grid and the scale of the building. (In fact, CPTED is only non-compliant with ATD at the building level.) It is interesting to note that these discrepancies are issues of fundamental design philosophy within each strategy, and not necessarily the predominant discrepancies that actually occur in practice.

Visits to Boston and New York indicate that the discrepancies between ATD and CPTED are largely at the site scale. Poorly-articulated separations between the public and private realm, repetitive security elements, and empty or threatening spaces are common sights in both cities. This does not imply that CPTED and ATD are not compatible at the site scale (as shown above), but rather illustrates a gap in knowledge about the possibility for optimization. The philosophy, as clearly articulated in ATD documents, is not translated through practice. Future research in the area of ATD optimization should endeavor to discern why this is the case by focusing on strategies utilized by security design firms and looking at the processes used to determine design strategies.

In light of these findings, it seems that with physical manifestations of ATD, only lip service has been paid to CPTED. ATD and CPTED have yet to be truly integrated in practice, which has created a number of missed opportunities and troubling design implications. As indicated above, integration would allow for site design optimization. Optimization would increase the likelihood of crime prevention from both a prosaic daily perspective as well as a terrorist event perspective.

## **REGULATION OF PRIVATE PROPERTY AS CONTRIBUTORS TO THE PUBLIC REALM**

While instances of non-optimization between ATD and CPTED are, in a broad sense, issues of ‘public safety,’ David Carlson from the Boston Civic Design Commission noted that ‘public safety’ in terms of the design environment is an elusive issue (Carlson 2010). This is because the space that hosts ATD and CPTED interventions is either semi-private or private. CPTED and antiterrorism design are issues that are of particular interest in the site design and perimeters of buildings. Often, all of this space is privately-owned, thus making site security not a ‘public safety’ issue, but a ‘private safety’ issue. It is the private owners that generate a threat assessment of their building, decide on the security tier, and act to mitigate perceived threats. In the words of one security expert,

With a majority of critical infrastructure in the private sector, it is important to note that responsibility for security and protection rests with the owners of infrastructure themselves. The nudging and supervision of the federal government is necessary to make sure there is a standard of care (Atlas and DiGregario 2008).

There are no standards to force compliance, other than building codes. The latest building codes incorporate some information of importance, but do not go nearly as far as suggested in the FEMA documents or the Interagency Security Committee (ISC) Design Criteria. Building codes do not specify much site design, which is what most affects and concerns the public in the use and perception of urban space (and on which most of this thesis focuses).

When comparing the process of physical intervention planning and installation in New York and Boston, it is clear that New York's review process is much more open and delineated than Boston's. New York sets guidelines and designates an agency responsible for ensuring conformity to the process (the DOT). Boston's process is much less transparent, perhaps because there are fewer instances of public realm interventions, and fewer historic events that have forced the city to deal with these issues.

Regardless of municipal or state guidance in terms of invasion of and intervention within the public realm, there are many more issues related to site design of private property. However, in the urban environment, the public and private environments are so closely linked that one bleeds into the other. As described in the last chapter, Boston deals with this through its Civic Design Commission. The Commission's mission statement includes the following:

The BCDC's purpose...is to provide a forum for the general public and the professional design community to participate in the shaping of the city's physical form and natural environment...its primary function has been as design advisors, both to the Boston Redevelopment Authority (BRA) and to project proponents. We believe that projects reviewed by the Commission have been improved by this review process and, more importantly, their impact on the streets and squares, the public domain of Boston, has been made more positive. As individual designers focus their attention on specific projects for their clients, it is our role to think of the city as a whole (Boston Redevelopment Authority 2010).

Boston, through the BCDC, recognizes the interplay between public and private properties. By creating an entity (BCDC) to judge the city "as a whole," Boston acknowledges that the private realm influences the public realm; or, that one element can easily influence the whole of an urban environment.

In terms of ATD, the impact of one security zone can be felt for several blocks. Target hardening of private buildings in an area will, as a cumulative effect, create an unfriendly space and frighten away pedestrians. On the other hand, as proven by several terrorist incidents in the last fifty years, failing to implement effective site design can lead to catastrophic damage by truck bomb not only in the target building, but in nearby structures as well.

Since the myriad private decisions create a significant impact on the city, they should be guided or incentivized to adhere to certain regulations. There are a number of design suggestions, like the FEMA guidelines, but these have no teeth. The documents have a friendly didactic tone, and seem more directed to interested government officials and educated laypeople than to decision-makers in agencies or security firms responsible for site design. The document guidelines present neither sticks nor carrots to reinforce convictions, only suggestions for well-being. This is not enough of an incentive to create true, lasting, and responsible site security. These guidelines will not ensure that CPTED is built into ATD

interventions. As described through images in previous chapters, FEMA guidelines certainly have not ensured CPTED is built into ATD interventions so far.

Nor will guidelines ensure that the principles of civic design are sought after or fulfilled at these sites. As indicated in the last chapter, deference to civic design principles will ultimately determine how well ATD interventions fit into the context of the city and how truly effective they can be. The creation of physical protection should not be the sole purpose of ATD; rather, ATD should simultaneously provide amenities and inspire questions and cognizance regarding the urban environment.

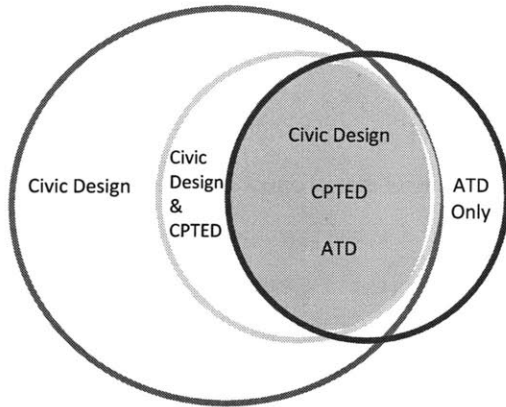


Image 23. Civic Design, CPTED, and ATD

To the left is a diagram of the interrelation of ATD (in red), CPTED (in yellow), and civic design (in blue). The principles of CPTED fit easily within the principles of civic design, as they seek to promote safety and create a cognizance regarding the urban environment. ATD and CPTED largely overlap, as illustrated by the charts earlier in this chapter. However, there are a few discrepancies between ATD and CPTED, and indeed between ATD and civic design, that edge ATD just out of the circle that

represents both CPTED and Civic Design principles and goals.

## RECOMMENDATIONS

Based upon the understanding of optimization of the three design paradigms (Civic Design, CPTED, and ATD), I propose several recommendations to allow public officials, building owners, and security professionals to guide their practice so as to encourage it to fall within the strategic gray area on the diagram above. This gray area represents the confluence of all three design paradigms, and projects developed at this intersection will capitalize on the strengths of each.

The recommendations for strengthening the enforcement of design optimization are categorized below as design and policy strategies. The design recommendation list is arranged by scale, beginning at the largest (scale of the downtown) and moving to the smallest (scale of the building). It is crucial for both lists to concentrate on the largest scale possible, as protection at this largest scale will mitigate the need for dramatic security interventions at the more invasive site and building scales. Note that, in addition to bringing ATD into compliance with CPTED, the recommendations below also embrace the tenets of civic design.

## *DESIGN RECOMMENDATIONS*

### SCALE OF THE DOWNTOWN

1. **Encourage the ‘ring of steel’ in high-threat CBDs.** Spotty, non-cohesive security is ineffectual security that encourages piecemeal private solutions that erode the public realm. Public officials charged with protecting downtowns facing legitimate threats should have the capacity to review information at the largest scale possible. If counterterrorism can be employed at a larger scale and promote security around the outer perimeter of the downtown, then dramatic antiterrorism measures within the downtown are more likely to be unnecessary.

This suggestion is not without base: not only has a ‘ring of steel’ worked well (from an antiterrorism and crime prevention standpoint) in London, it has recently been proposed and dismissed in New York City. Traditionally Americans are more uncomfortable with CCTV than the British (Schneider and Kitchen 2001), and even Londoners were aggrieved when the ‘ring’ was first established. The possibility of constructing a ‘ring of steel’ is likely to take some time to accrue public approval. However, this approach provides too many benefits for it to be dropped completely. The New York City intervention was proposed as a manner through which to implement a congestion tax. While that was unlikely to be the true motivation for the plan, it would certainly prove to be a boon for the city’s public transportation system, which is currently under financial duress. As a result, it would also impart environmental benefits. There are many clear winners if a ring of steel were to be established, but in order for the project to resurface and garner the necessary public approval, public education campaigns must be launched and government representatives must be resolute in their goals.

### SCALE OF THE GRID

2. **Where security zones are imperative, activate the spaces.** Security zones should be seen as places of opportunity, not places devoid of life. Create environments that are capable of being supervised but that are interesting and will invite people in. This is not to suggest that people need to be right up against a secure building; rather, a secure perimeter can still be maintained while activating the rest of the space. Consider installation of community vegetable gardens or a small playground. Encourage vendors and add removable seating. There is no reason that even ‘secure’ space should be wasted in the downtown. Spaces in New York City (like the area near One Police Plaza) and Beverly Street in Boston should not continue to be vacant. Beverly Street in particular could become a lunchtime asset to workers in nearby government buildings. Or it might become an open-air museum commemorating the West End neighborhood that once stood in the vicinity.

3. **Remove movement predictors where possible.** If the physical design of a place will not allow for removal, then modify the space with security mirrors and emergency phones. Entrapment areas must be closed at night.

#### SCALE OF THE SITE

4. **CPTED principles MUST be integrated with Antiterrorism design at the site level.** Failing to integrate the two strategies is a design travesty. While there may be budgetary reasons for failing to renovate ugly interventions, there are no excuses for the presence of those interventions to begin with, or the fact that they do not maximize CPTED strategies where possible. Policies articulated in the section below should help to mandate this.

#### SCALE OF THE BUILDING

5. **Disincentivize all fortressing, except in extreme situations.** ATD calls for removal of all ground floor windows; however, for the sake of both CPTED and Civic Design, ground floor transparency in the form of windows must be permitted, and architecture must remain inviting and open. As a compromise, ground floor windows on high risk buildings should be mandatorily reinforced, and site level architectural elements should be bolstered. The face of the city should be retrofitted to adapt to terrorist activity, but it should not be fundamentally altered.

#### *POLICY RECOMMENDATIONS*

1. **Local government must appoint an agency accountable for reviewing public realm antiterrorism interventions.** New York already has this mechanism in place. Obvious candidates in Boston include the Boston Civic Design Commission or the Department of Transportation; however, adding this power to either agency might not be as effective as creating a new supervisory panel at the Boston Redevelopment Authority (BRA).

2. **Downtowns serving urbanized areas with Census populations greater than one million must create individualized Security Plans.** If a Master Plan of the downtown exists, the Security Plan may be merged with it. All urbanized areas with Census populations greater than one million should build a section on security into long range master planning. Security is a goal that cities should work toward, and it is something that can be gently guided, rather than being left completely to the interest of private companies. Regardless of terrorist threat level, urban safety concerns and goals should be acknowledged. The master plan should address the importance of CPTED in this process. Security plans should be

created through a multi-lateral process involving the planning agency, the police department, interested citizens, and private corporations with interests in the downtown.

Perhaps one of the most important functions of building a security section into the master plan is the opportunity to designate goals for different city sections. This idea is largely inspired by the National Capital Planning Commission, which divided Washington, D.C. into natural sections. Each section was given a different ‘security aesthetic.’ As superficial as this seems, providing cohesive design can prevent security from overpowering the experience of the urban environment. In terms of creating this type of aesthetic plan in urban areas, it seems that there will be natural breaks that a planning commission will be able to recognize immediately. In addition, there might be sections of the city where security goals differ. This is not the same as creating a ‘security aesthetic’ in the downtown.

Boston already has a coordinated street furniture program. It includes automatic public toilets, bus shelters, city information panels, newsstands, and telephone pillars. This program could also be used to coordinate bollards, benches, and planters where they are deemed necessary through thorough threat assessment.

Building security into the master plan, even in terms of aesthetics, will provide an opportunity to increase recognition of territory at a larger than normal scale (in a ‘district’ rather than a ‘site’). Creating clear delineations will enhance territoriality, and help to create an identity and ownership. Creation of visual districts in terms of security will also create an easier way of noting compliance and ensuring regulation. This will aid in the transfer of the public realm to agencies in the public sector.

**3. Design guidelines crafted to meet the functional and aesthetic needs of the Master Security Plan should be concurrently drafted.** These must include CPTED guidelines that are geared to conform to local preferences. For examples, planners should look toward guidelines from Tempe, Arizona; Broward County, Sarasota, Tampa, and Orlando, Florida; and Ann Arbor, Michigan (R. Atlas, 21st Century Security 2008). These places already have CPTED codes in place. There should also be a discussion of the inherent compatibility of CPTED and ATD to avoid conflicts at the site scale in actual practice.

**4. All interventions must go through the traditional design review process to check for compliance with CPTED and civic design goals.**

These changes are exceptionally important in order to maintain traditionally vibrant downtowns and central business districts in post-9/11 America. CPTED must be fully integrated with Antiterrorism Design; otherwise, the qualities of downtown that have defined American cities since colonial times will be lost. Using CPTED as the optimizing force on ATD is strategic, since it not only is familiar to



important agencies within the city, but it also endeavors to make life safe on a day-to-day basis. CPTED and ATD together herald a time where security planners are as interested in crime that makes life difficult on a day-to-day basis (crimes against people and against property) as they are in crime that is more infrequent though more catastrophic.

## CONCLUSION

This thesis visits the history, theory, and practice of both antiterrorism design and CPTED. It explores the manifestations of both strategies in New York and Boston in an effort to discern where and how synergies are plausible. It proposed to better integrate both ATD and CPTED with civic design. Finally, it concluded with civic design-oriented recommendations for Boston and New York City (and other cities, generally) to optimize antiterrorism design with CPTED.

There is still much research to do on this topic. Policies and designs in other cities should be explored, and security design education should be analyzed. In the future, models of antiterrorism design intervention decision-making should be created for both public and private processes, and compared to real scenarios. Future researchers should consult more closely with decisions-makers and cultivate a closer connection to agencies involved in the antiterrorism design process.

In an endeavor to begin to explain the urban elements of the post-9/11 city, this thesis wanders through the modern mire of antiterrorism design. History has predisposed ATD to be militaristic. This is an inappropriate reaction for the design of urban downtowns, which are supposed to be the very example of lively and open public realms. Unfortunately, many ATD interventions display just such militaristic design determination. It is peculiar that the ailment of militaristic design has been noted in design documents that exhibit best practices, but that situations have not been remedied. However, there have been no incentives for change in pre-existing interventions, and the recent economic downturn may have only exacerbated plans for remediation.

The hope, then, is that new interventions, being planned and implemented now, will be able to use the concepts contained within these pages. Even more pressing is the hope that cities will adopt policies to address poor design choices before ATD interventions become more prevalent in the future. Terrifyingly, attacks are unlikely to desist unless there is a radical ideological shift in terrorist groups. This, however, is unlikely to happen unless counterterrorism strategies invest more in education in at-risk countries and less in eradication of ideology through force. However, it is much more difficult to eliminate ideas rather than people, which certainly goes beyond the scope of this thesis.

As time progresses, it is likely that terrorist attacks will evolve, meriting different system responses including ones that are unlikely to be solely physical. However, the strategies and interventions we see now have a way of becoming manifest and acceptable in the built environment. It is imperative that American downtowns retain the qualities that make them great. Militaristic antiterrorism design must be optimized by CPTED and humanized by public realm civic design. The American people deserve downtowns that are open and safe from crime as well as terrorism. Inspiring fear in terrorists should not come at the cost of inspiring fear in the American people.





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