

**A PLACE-BASED APPROACH TO UNDERSTANDING GUN VIOLENCE:**

Exploring the Physical Characteristics of Sites where Youth-Related Gun Violence  
Occurred in the Halifax Regional Municipality

By

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This work is dedicated to my father, Charles T. Alexander who passed away on January  
27, 2012. May he rest in peace!

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**ABSTRACT**

This research examines whether a greater understanding of the causes of gun violence can be gleaned by examining the characteristics of the physical and built environment where shootings take place. This study seeks to fill a void in the extant literature by exploring the characteristics of sites where youth gun violence occurred in Halifax Regional Municipality. Drawing from the literature on the relationship between crime, crime prevention and the physical environment, 36 shooting sites were examined to identify common design features. A standardized questionnaire gathered data that measured four physical and built environmental attributes that the literature suggests can influence the opportunity for criminal and violent acts to occur in a particular time and place: (1) location/surrounding environment, (2) site permeability, (3) surveillance opportunities, and (4) image. The findings indicate that the following are common characteristics of sites where shootings took place: a high level of accessibility to targets via through streets and intersections, locations close to crime generators (bus stops, public housing, and fast food restaurants), design features that limit surveillance opportunities, and poorly maintained properties. These findings are limited by this study's lack of analysis that could draw a causal relationship between the physical and built environment, on the one hand, and human behavior (including that of offenders and the legitimate users of these sites), on the other.

April 24, 2014

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# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND

Gun violence is a social problem that is a major concern for many nations, including Canada. Cukier and Sidel (2006) state that globally, an average of 200,000 people die annually as a result of homicides, suicides and accidental fatalities involving firearms and even more people suffer from non-fatal firearm injuries. According to Cook and Moore (1999), “robberies and assaults committed with guns are more likely to result in the victim’s deaths than are similar violent crimes committed with other weapons” (p. 281). Additionally, the past decade has seen a vast increase in the availability of guns, thereby, making it easier for young people to obtain them, which in turn has elevated the rate of youth gun violence. For instance, in 2007, it was estimated that there are more than 875 million firearms in the world; 650 million of them are in the hand of civilians, representing roughly 75 per cent, which is equivalent to one gun for every seven people worldwide (Small Arms Survey, 2007; Alpers and Wilson, 2012).

In 2010, Canadians owned a half million more firearms than they did in 2006. According to 2011 annual report from the Royal Canadian Mounted Police (RCMP’s), there are approximately 7.8 million registered firearms in Canada, representing an overall rate of about 24,882 per 100,000 population. Partially, as a result of increased availability, there has been a slight increase in firearm-related homicides in Canada. The rate of homicide involving firearms rose from 0.46 per in 2011 to 0.49 in 2012 (Boyce and Cotter, 2013). Furthermore, these authors note that in 2012, “among CMAs, Halifax recorded the highest rate of firearm-related homicide at 1.93 victims per 100,000 population; almost four times higher than the national rate” (p. 13). The latter finding is



important, as Clairmont et al. (2014) point out that while homicide rates have actually been declining over the last few years in Canada and the US, this has not been the case for Halifax Regional Municipality (HRM). Furthermore, studies have indicated that shootings continued to be one of the most dominant methods to commit homicide especially among youths under 30 years of age.

The World Health Organization (2002) defines youth violence as “the intentional use of physical force or power, threatened or actual, exerted by or against children, adolescents or young adults, ages 10–29, which results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation” (as cited in Mercy et al., 2002). In recent years, the problem of youth violence has worsened, in part due to the widespread availability of firearms (Reich, Culross and Behram, 2002). As a result, gun violence has become a significant cause of death and injury among juveniles. Studies have indicated that it’s more likely for youths to die from a firearm injury than of all natural causes or disease (Fingerhut 1993; May, Ferguson and Cronin, 1995).

Fagan and Wilkinson (1998) argue that “guns are a central part of the changing character of youth violence, from being a minor concern prior to the 1970s to being major youth violence problem in the past decade” (p.106). In Canada, studies have found that juveniles (age 12 to 17 years) accused of committing a violent crime are more likely than adults to use a firearm (Dauvergne and De Socio, 2008). In addition, Mahony (2011) adds that youth accused of homicide in this country are more likely to be associated with a gang and were more likely to involve two or more co-accused. According to the Canadian Paediatric Society (2005), Canada has one of the highest rates of firearm injury among youth in the developed world. Clairmont (2008, 2014) notes that violent offences among youth in HRM has been consistently higher and do not show any evidence of a downward trend which suggests that youth are more likely than

adults to engage in violent crime. He also adds that a small number of young offenders may be responsible for much of the violent crime.

### **1.1.2. Gun Violence in Canada**

Recent trend data show that the rate of firearm related-homicide in Canada moderately declined between 1970 and 1998 and since then has remained fairly constant (Dauvergne and De Socio, 2008; Tita, Troshynski, and Graves, 2007). For the period 1995 to 2009, the average homicide by firearm rate per 100,000 people remained relatively stable at about 0.5, while the percentage of homicide by firearm has also been fairly steady at nearly 33 percent (United Office of Drugs and Crime, 2011). The rate of firearm-related homicide in Canada increased between 2002 and 2008 and then fell by 12 percent in 2009 (Beattie and Cotter, 2010). In 2011, Canada recorded its lowest rate of firearm homicide in almost 50 years (0.46 per 100,000).

The overall drop in the rate of homicide by firearms can be attributed to the decrease in the number of homicides committed by rifles/shotguns (Dauvergne and De Socio, 2008; Mahony, 2011). As noted by Tita et al. (2007), “there has been a marked shift in the types of firearm being used. Prior to the mid-1990s, rifles and shotguns were the primary type of weapon used in homicide” (p. 3). However, handguns now account for the majority of homicides committed with a firearm. For example, Tita et al. (2007) note that in 2005, handguns accounted for 58 percent of firearm homicides, compared to 30 percent committed with rifles or shotguns; while in 2006 there were three times as many homicides committed by handguns compared to rifles or shotguns (Dauvergne and De Socio , 2008). Beattie and Cotter (2010) add that in 2009, of the 179 victims killed by a firearm, 69 percent involved the use of a handgun which was twice the number of homicide committed with rifles or shotguns (29 percent). In addition, recent Statistics Canada data show that in 2011 handguns still accounted for about two-thirds

of all firearms used to commit homicide (Perreault, 2012). Mahony (2011, p. 7) notes that “over the past 30 years, the most common method used to commit homicide varied between shootings and stabbings. In 2010, 32% of homicides involved shootings, followed by stabbings (31%) and beatings (22%).” Of the 32 percent of firearm homicide, handguns accounted for 64 percent.

Statistical data also show that males tend to commit more crime frequently than females, are most likely to be victims of homicides than females, and they are even more likely to be killed by a firearm. Male victims and offenders tend to be younger than female victims and offenders (Li, 2007).

### **1.1.3. Youth Gun Violence in Canada**

Youth gun violence in Canada has fluctuated in recent years; between 1998 and 2002 there was a decrease of 19 percent in the overall rate of youth charged with firearm-related violent crime, since then gun violence committed by youth rose in three of the past four years (Dauvergne and Socio, 2008). In 2006, youth gun violence was 32 percent higher than in 2002 reaching its highest peak since 1998. Within that same year, police-reported data revealed that 1,287 youths were charged with firearm-related violent crimes, representing 2.8 percent of all gun violence committed by youth and higher than the 1.8 percent rate for adults (Dauvergne and Socio, 2008). Furthermore, youth committed less homicide crime than adults, for example in that same year 17 percent of homicides committed by youth involved a firearm lower than 22 percent of homicide committed by adults (Li, 2007).

The increase in the rate of youth gun violence can be attributed to the change in the choice of weapon among young people from knives or fists to handguns (semiautomatic) since they are much lethal (Blumstein & Wallman, 2000). Fagan and Wilkinson (1998) point out that “guns play a central role in initiating, sustaining and

elevating the epidemic of youth violence” (p.105) since youth associate guns with power, respect, identity, masculinity and protection (Fagan and Wilkinson, 1998; Black and Hausman, 2008). Hemenway et al. (1996) add that “gun carrying produce both positive and negative externalities, in that gun carrying by some may increase the likelihood that other will carry guns” (p. 44). For instance, in their study of juvenile males in Rochester, New York, Lizotte and Sheppard (2001) note that “the amount of serious violent crime the boys committed during periods of active gun carrying was more than five times the amount they committed when they did not carry guns” (p. 6).

#### 1.1.4. Youth Violence in Nova Scotia and the Halifax Regional Municipality

The table below summarizes police-reported violent crime rates for youth in Nova Scotia and Canada for 2008 to 2012.

**Table 1.1: Police-reported youth violent crime rates: Nova Scotia and Canada, 2008 to 2012**

	Nova Scotia					Canada				
	Homicide	Robbery	Major Assault	Total Violent Crime	YVCSI	Homicide	Robbery	Major Assault	Total Violent Crime	YVCSI
2008	6	164	411	2,755	NA	2	171	286	1,887	NA
2009	0.0	164	339	2,659	NA	3.1	162	274	1,864	NA
2010	4.6	120	287	2,676	110	2.3	168	247	1,838	93.7
2011	3.1	170	311	2,649	114.2	1.9	311	240	1,756	88.6
2012	0.0	161	294	2,755	100.4	1.4	153	219	1,639	83.0
<b>Avg.</b>	<b>2.74</b>	<b>155.8</b>	<b>328.4</b>	<b>2698.8</b>	<b>108.2</b>	<b>2.14</b>	<b>193</b>	<b>253.2</b>	<b>1796.8</b>	<b>88.43</b>

**Sources:** Wallace, 2009; Dauvergne & Turner, 2010; Brennan and Dauvergne, 2011; Brennan, 2012; Perreault, 2013

As this table shows, all of Nova Scotia’s major youth violent crime indicators during this period are higher than the national rates. The average Youth Violent Crime

Severity Index (YVCSI) rate<sup>1</sup> for the province during this period was 108.2 compared to the national average of 88.43. Accordingly, compared to the national average, Nova Scotia posted higher rates for the more serious violent offences of homicide, robbery, and major assault.

The trends from 2008 to 2012 for the province show that the total violent crime rate remained relatively stable. However, the YVCSI rate dropped slightly between 2010 and 2012, meaning there was less serious violent crimes. In particular, there was also a drop in homicides by youth as well as a significant decrease in major assaults by youth. Data provided by the Halifax Regional Police (HRP) for this research indicates that between 2008 and 2009, violent crime committed by youth in the HRM decreased from 682 incidents to 509. The number increased to 526 from 2009 to 2010 and then increased again in 2011 to 576. Thus, while the violent crime rate among youth declined by 15 percent between 2008 and 2011, it increased by 9.5 percent between 2009 and 2011 (while increasing 11 percent between 2010 and 2011).

Statistics generated from both police reports and victimization surveys indicate that much of the violent crime in Halifax involves less serious common assaults. However, the HRM continues to exceed the national rate with respect to gun-related crimes. Police-recorded statistics for 2011 indicate that, “the vast majority (91%) of firearm homicides that occurred in Canada’s census metropolitan areas (CMAs) in 2011 were concentrated in the seven largest CMAs and Halifax. In particular, Halifax (1.72), Edmonton (1.08), and Winnipeg (1.04) reported the highest rates of firearm homicide per 100,000 populations in 2011” (Perreault, 2012, p. 7).

Furthermore, police-reported statistics suggests that gun-related violence has been increasing in Halifax in recent years. In July of 2011, the city recorded its 45th

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<sup>1</sup> The Youth Violent Crime Severity Index rate is weighted in favour of more serious violent crimes (murder, robbery, aggravated assault) compared to the Youth Violent Crime rate which applies the same weight to all police-reported violent incidents regardless how serious.

shooting incident which equaled the total for all of 2010. Const. Brian Palmeter of Halifax Regional Police told the media, "We attribute that to the criminal element ... relying on firearms as their tool of choice to settle their disputes. It's part of the overall escalation ... of violence and power. What may have been settled years ago with a knife is now being settled with a gun" (*Chronicle Herald*, July 7, 2011). According to the HRM Office of Public Safety, "Much of the violent crime that occurs in our community is the result of altercations between individuals or groups of people who are typically involved in criminal activity – often the illegal drug trade – and are intent on using violence to settle a score. More and more often, they're resorting to gun violence. It's not a case of widespread violence but rather individuals or groups targeting one another" (Halifax Regional Municipality, September, 2011, p. 4).

#### **1.1.5. Gang-related Violence**

Police-reported violent crime statistics for 2011 indicate that for Canada as a whole, "one-third of all youth accused of homicide were involved in a gang-related homicide..." (Perreault, 2012, p.14). Statistics Canada notes that for the HRM, "there has also been an increase in gang-related homicides in recent years." Since 2001, there have been 16 gang-related homicides in Nova Scotia, 14 of which occurred between 2007 and 2011 (Perreault, 2012, p. 19). Local gangs, especially those involved in the drug trade, are attributed at least partial blame for any increase in homicides and gun-related violence in the HRM in recent years. The final report of the Mayor's Roundtable on Violence in 2008 stated that the HRM is "home to small gangs centered in the drug trade and accountable for a number of retaliatory murders and public-frightening drive-by shootings..." (Clairmont, 2008, p. 22). In 2012, an integrated enforcement team involving the Halifax Regional Police and the RCMP was formed to focus on gangs and gang-related gun

violence. According to a 2012 media article, the team's head, Staff Sgt. Jim Butler, indicated this unit is

... watching six to eight gangs, ranging in size from four members up to dozens. Most have six to eight members and most of them are young, some only 15 ... All of the gangs are in the drug business and have firearms, he said. They feel the need to carry weapons to intimidate rivals and protect their own drug-dealing turf and to expand their territory ... When asked to make an estimate, he said about 10 to 12 local gang members have been murdered in Halifax in the last five years (*Chronicle Herald*, March 5, 2012).

Around the same time, Public Safety Canada (2012, p. 1), estimated that in the HRM "there were 80 youth directly involved in gangs with 20 more youth identified as affiliated with gang members or gang activities. Four HRM Public Housing projects had active gangs or evidence of gang-related violence."

#### **1.1.6 Summary: Youth Violence in Canada and the HRM**

Any discernible trend in violent youth crime between 2008 and 2012 is difficult to identify. The youth homicide rate decreased from 6.0 to 0.0 during this period, although the rate was still above the national average in both 2010 and 2011. The youth robbery rate also declined, but only slightly, with the highest rate occurring in 2011. Perhaps the most perceptible trend was the rate of major assaults by youth, which declined by 28.4 percent between 2008 and 2012. While it is too early to conclude that serious violent youth crime peaked in 2011, there was a decline in 2012 in the rate of youth homicides, robbery, major assaults, and in the youth violent crime severity index rate. However, the total youth violent crime rate for the HRM (which includes less serious offences) was the same in 2012 compared to 2008. HRM police have also indicated that there has been an increase in firearm offences involving youth in recent years. Finally, the rate of violent

youth crime in all categories continues to be higher in the HRM compared to national rates.

## **1.2. PROBLEM STATEMENT**

This research attempts to address the considerable voids in the extant literature regarding the physical environmental settings of youth gun violence in Canada and the HRM specifically. In the past, studies into the characteristics and causes of youth-related gun violence have focused on the social environment of the individual offenders and victims. Specifically, most of these studies focus on how social environmental risk factors – such as poverty, social exclusion, the preponderance of young men in violent subcultures and gangs, and the drug trade – are casually connected to gun violence (see, e.g., Blumstein, 1995; Cork, 1999; Cohen et al., 1998, Tita and Greenbaum, 2009, Riley, 1998; Sheley and Wright, 1995; Griffith and Chavez, 2004; Fagan and Wilkinson, 1998).

In contrast, less scholarly attention has been accorded to the setting or the characteristics of the physical environment in which most public gun-related crime occurs. This is a significant omission because studies have shown that youth gun violence is not evenly distributed throughout cities; but rather, it is clustered among a group of serious offenders in a limited number of places (Braga, 2004). More specifically, studies have found that certain crimes including gun violence tend to cluster in areas high in opportunity for their commission. According to Xu, Kennedy, and Caplan (2010) “gun shootings are not randomly distributed throughout a terrain; but rather, are concentrated in a statistically significant way around certain features” (p. 2).

According to Cohen and Felson (1979), the emphasis on individual motivation in criminological theory fails to recognize the importance of the other elements of the crime equation, such as how the physical environment creates opportunities for crimes to



occur. As noted by Jeffrey (1971) the physical environment is a central component of the crime equation, because the environment can provide opportunities for crime to occur. Situational or “administrative” theories of crime emphasize the importance of the immediate place-based context of crime and violence to help understand mediating factors that may create or facilitate opportunities for crime and violence to occur (Xu, 2011). As Clarke (1994) notes, “crime cannot be explained simply by explaining criminal dispositions. It also has to be shown, how such dispositions interact with situational factors favoring crime to produce a criminal act” (as cited in Clarke, 1997, p. 2). According to Schuessler (1964), “studies focusing on situational factors which militate for and against crime provide an instructive demonstration of the inadequacy of theories which concentrated exclusively on individual attributes. Personal attitudes and values may enable or even predispose a person to commit crime but rarely, if ever, compel him to do so” (p. 323). For a complete explanation of criminal behavior, it is necessary to comprehensively examine what motivates the offender, what opportunities are available that may promote criminal behavior and what interventions may have prevented the criminal activity (John Howard Society of Alberta, 1995b).

Thus, Sherman et al. (1989) argues that “the concentration of crime in specific places is great enough to shift the focus of research to places rather than neighborhoods or individual persons” (p. 43) since the physical design and layout of the physical environment are a key factor that determines why certain places are more prone to crime than others (Reynald, 2011). Brantingham and Brantingham (1981) add that an analysis of the physical environmental features such as, land uses, street lighting, and the design of landscape, etc., where crime transpires, “is promising because, once understood, available technologies can be used to modify these patterns and abate some crimes without doing significant damage to basic human rights” (p. 4).

Although in recent decades there have been a number of studies on gun violence, these studies have focused mainly on adult crime, or have not distinguished between adult and juvenile offenses. In addition, despite the growing evidence that scholars have emphasized the importance of the built environment on reducing crime (Jacobs, 1961; Angel, 1968; Newman, 1972; Crowe, 1991; Taylor and Harrell, 1996); studies on youth gun violence have largely ignored the places where youth commit their crime. Therefore, identifying features in the built and physical environment that may contribute to this phenomenon remains understudied.

In Canada, there is a paucity of research that has been devoted to exploring the influence of the crime setting; that is, the characteristics of physical environment in which gun-related crimes occur. Despite the high rate of youth violence in the HRM, no study has been identified by this research that focuses on the role that the physical environment may play in youth gun violence.

### **1.3. SIGNIFICANCE OF THE STUDY**

As indicated above, there is a need to understand how the design of the physical environment may contribute to youth- and gang- related gun violence. The study attempts to fill the void in the literature by examining the physical environment where youth-related gun violence is concentrated in Halifax, Nova Scotia. Moreover, the study will contribute to the extant literature on crime and place and help address the question of whether places are criminogenic by theorizing and analyzing whether there are certain features of the physical and built environment that promote gun violence (i.e., create opportunities for gun violence to occur). Being aware of the location and environmental features that affects youth gun violence can help urban designers, crime analysts and law enforcement agencies to design and develop effective crime control measures that will prevent or reduce further shooting from taking place in those concentrated areas.

#### **1.4. RESEARCH OBJECTIVES AND QUESTIONS**

The over-riding goal of this research is to describe and analyze the nature and scope of youth gun violence in Halifax Regional Municipality, with particular emphasis on exploring the predominant physical characteristics of 36 sites where youth shootings took place in the HRM. Selective criminological theories will be tested to help determine whether specific design features of the physical environment contributes to the commission of gun violence by young people. Based on this over-riding goal, there are two specific objectives of this research.

The first objective of this research is to identify, describe, and analyze the physical and built characteristics of places where youth gun violence occurred in the HRM. Research questions resulting from this objective include the following:

What are the characteristics of the physical and built environment where shootings take place? Are there certain features of built and physical environment that may create opportunities for gun violence to occur? Are there certain physical features present in these locations that attract offenders from surrounding areas? Can these places be considered criminogenic in some way? Do the design features of the built and physical environment increase the occurrence of youth-related shootings?

The second objective of this study is to apply selective theories, to help interpret the data, by analyzing how the design of the physical and built environment can promote or inhibit the opportunities for criminal acts to occur in a particular time and place. The principal research question resulting from this objective is: What theories can help better understand why youth-related gun violence concentrated in certain parts of the city; that is whether certain features of the built and physical environment contribute to gun violence?

## **1.5. Thesis Structure**

Chapter One of this thesis provides an overview of and background to the thesis topic and introduces the rationale behind the study. Chapter Two outlines the theoretical framework of this study, which focuses on how features of the physical environment may promote or inhibit the opportunities for criminal acts to occur in a particular time and place. Chapter Three introduces the research design and methodology that was employed in this study. Chapter Four presents and analyzes the findings of the primary research involved in this study. Finally, Chapter Five summarizes and provides a conclusion for the findings and analyses of this study.

## CHAPTER 2

### THEORETICAL FRAMEWORK

#### 2.1. Introduction

This section provides an overview of theories about the linkages between crime and the physical environment, including those theories that apply or can be applied to gun violence. It discusses why it is important for research on gun-related studies to examine in detail the physical environment in which shootings occur and, more specifically, the physical and built environmental features that may create opportunities for shootings.

#### 2.2. Crime and the Physical Environment

Within the field of criminology, theories and research into the causes of crime and criminal behaviour has traditionally focused on the characteristics, disposition and motivation of the offender. An alternative approach has emerged that is concerned with the settings of crime events (and how such settings can be altered to prevent or minimize criminal opportunities). The latter approach, which has been referred to as neo-classical criminology, is considered to be a departure from traditional criminology in its orientation (Clarke, 1997, Clarke and Mayhew, 1980) because, rather than focusing on the offender, this situational approach concentrates on the settings or the “place” where crime occurs, and how such settings can influence crime and criminal behavior (as cited in Clarke, 1997). A place is defined as “a fixed physical environment that can be seen completely and simultaneously at least on its surface, by one’s naked eye” (Sherman et al., 1989, p. 31). Within the context of criminology, a place is normally “a very small area usually a street corner, address, building, or street segment” (Eck and Weisburd, 1995, p. 1) and has five characteristics that are deemed crucial when studying its relationship with crime and criminal behaviour: location, boundaries, function, control and size (Eck,

1994). Eck and Guerette (2012), add that places are important in examining the distribution of crime, since they are the locations where offenders and targets converge.

The concern for the relationship between crime and place is hardly new, but can be traced to the beginning of the 19th century in France (Paternoster and Bachman, 2001) through the works of Andre-Michel Guerry and Adolphe Qutelet. Both researchers independently studied French criminal statistics, mapping violent crimes and property crime at the neighborhood level (Brantingham and Brantingham, 1981). They discovered that crime varied significantly and was not randomly dispersed throughout the country. They found that violent crime was highest in areas characterized by low economic status, while property crime was more prevalent in wealthy, industrialized areas (Wortley and Mazerolle, 2008). In the U.S., the ecological studies of the Chicago School through the works of Park and Burgess (1925) and particularly Shaw and McKay (1942) also confirmed the spatial distribution of crime. Shaw and McKay building on Burgess concentric zone model examined maps of the city of Chicago. They detected a systematic pattern in the delinquency rates around the city. They found that the rates of delinquency remained high in certain areas of the neighborhood, particularly in the inner city neighborhoods, despite continual changes in the neighborhood composition (Akers, 2000; Curran and Renzetti, 2001). However, these studies analyzed the spatial patterning of crime through a largely sociological framework and as such did not acknowledge the influence of the physical environment in which crime and criminal behavior occurs. As Eck and Weisburd (1995) point out, these studies employed “a ‘macro’ approach – looking at the aggregates of places such as regions, states, cities, communities and neighborhoods – rather than a “micro” approach that examines places themselves” (p. 2).

In recent years, criminologists and other researchers have begun to emphasize the importance of places, their location, and their physical and built characteristics in

explaining the occurrence of criminal events and behaviour (Eck and Weisburd, 1995; Taylor and Harrell, 1996; Brantingham and Brantingham, 1981, 1993). This situational approach argues that “criminal activities are clearly linked to specific characteristics of places, as well as, the nature of guardianships that this place enjoys” (Loukaitou-Sideris, 1999, p. 3). Therefore, it is important not only to understand the physical and built characteristics of a particular setting, but also what characteristics of places that may serve to create or minimize the opportunities for crime and criminal behavior to occur. An understanding of the latter is especially important in order to alter those features in such a manner that would reduce or remove criminal opportunities (Engstad, 1975).

### **2.3. Crime, Violence, and the Design of the Built and Physical Environment**

The over-arching theoretical framework for this thesis is concerned with how the physical and built environment may influence criminal and violent acts by providing opportunities for such acts to occur, which include how environments may influence the behavior of (potential) offenders and victims. The theoretical school of thought that will be used to guide this study is Crime Prevention through Environmental Design (CPTED), which is concerned with “preventing criminal victimization, offending, and fear of crime at places by using environmental design as a tool for discouraging crime” (Fisher and Lab, 2010, p. 221). CPTED was originally coined by C. Ray Jeffrey in 1971, and is based on the assumption that “the proper design and effective use of the built environment can lead to a reduction in the fear of crime and the incidence of crime, and to an improvement in the quality of life” (Crowe, 1991, p. 1). To prevent the opportunity for a criminal act to occur, the design of physical and built environments should: “(1) create opportunities for natural surveillance by residents, neighbors and bystanders; (2) instill a sense of territoriality so that residents develop proprietary attitudes and outsiders feel deterred from entering a private space; (3) build communities and avoid social isolation;

and (4) protect targets of crime” (Kaytal 2000, p. 1048-49, as cited in White, 2006, p. 71). CPTED can work directly to prevent crime “by restricting access to property and removing criminal opportunities through the design and management of the physical environment that satisfy the basic principles of situational crime prevention (increase the efforts, increase the risk, reduce the rewards, etc.) and indirectly to reduce crime, fear, and related problems by designs that are meant to influence the social behavior of legitimate users of a particular space” (Schneider, 2010, p. 59).

The theory behind CPTED is that human behavior can be influenced by one’s social and physical environment, and, as such, criminal behavior may be promoted through opportunities that have been created through the design of the built and physical environment. Crowe (2000, p. 35) notes that the environmental design, in terms of CPTED, is “rooted in the design of the human/environment relationship” which embodies a number of concepts. CPTED strategies are based on the assumption that most offenders are rational choice decision makers who “seek to maximize the rewards of committing the crime while minimizing the risks of being apprehended and punished” (White, 2006, pg. 73). According to Rapoport (1982), “the subject reads the cues, identifies the situation and the context, and acts accordingly” (p. 56). Therefore, “by removing the reinforcement from criminal acts, criminal behavior will not occur since nonreinforced behavior will not take place” (Jeffrey and Zahm, 1993, p. 330). As Minnery and Lim (2005) posit CPTED is a proactive strategy that aims to prevent crime before it happens.

Many thinkers have contributed to the theoretical development of CPTED. One of the earliest contributions can be found is Jane Jacob’s classic book, *The Death and Life of Great American Cities*, published in 1961. Jacobs proposed a new way of looking at the relationship between the physical environment and crime, and stressed the importance of territorial identity and natural surveillance as crime deterrents (Crowe,



2000). Jacobs proposed the concept of “eyes on the streets” for real crime prevention. Based on her observation, she outlined three attributes that are necessary to the healthy development of a city street:

1. There must be a clear demarcation of private and public spaces.
2. There must be eyes upon the street; eyes belonging to those we might call the natural proprietors of the street.
3. The sidewalk must have users on it fairly continuously, both to add to the number of effective eyes on the street and to induce the people in buildings along the street to watch the sidewalks in sufficient numbers (Jacobs 1961, p. 35).

In other words, Jacob felt that having more people on the street or watching it would make the street safer since potential offenders “will be aware of these higher levels of ‘natural’ surveillance and will be more hesitant about offending” (Taylor and Gottfredson, 1986, p. 398). In short, “Jacobs felt that architecture, landscape design and the urban planning would have an impact on the shaping of physical environment as well as governing and ordering the behavior of different people” (Lin, 2010, p. 25).

Schlomo Angel, another early pioneer of CPTED studied street crime in Oakland. He argues that “ the physical environment can exert a direct influence on crime settings by delineating territories, reducing or increasing accessibility by the creation or elimination of boundaries and circulation networks, and by facilitating surveillance by the citizenry and the police”( Angel, 1968, p. 15). Angel asserts that “deterrents to crime include high-intensity use of an area which provides large numbers of effective witnesses and low-intensity land use which decreases crime because of lower numbers of potential victims. In between high and low intensity use , in periods of moderate use, criminal opportunities abound where there are not enough witnesses to deter crime” (Robinson, 1999, p. 432). He posited that the commercial strip environment was particularly

susceptible to crime because it thinned out activity, therefore, making it less complicated for individuals to commit street crime (Loukaitou-Sideris, 1999).

The basic principles of CPTED also rely heavily on Oscar Newman's (1972) defensible space theory. Newman argues that "defensible space is a model for residential environments which inhibits crime by creating the physical expression of a social fabric that defends itself" (Newman, 1972, p. 3). The theory is premised on the notion that the physical features of an area can influence the behavior of residents and other legitimate users of that space so that they take a more proprietary interest over that space. Lab (2000) notes,

For residents, the appearance and design of the area can engender a more caring attitude, draw the residents into contact with one another, and lead to further improvements and use of the area, and build a stake in the control and elimination of crime. For potential offenders, how a particular space is designed, maintained, and used can suggest that residents use and care for their surroundings, pay attention to what occurs and will intervene if an offense is seen (p. 27).

Newman's identifies four crucial elements of defensible space: territoriality, natural surveillance, image and milieu. Territoriality is the core of Newman's defensible space concept and is defined as "the capacity of the physical environment to create perceived zones of territorial influence" (Newman, 1972, p. 50). In other words, Newman believes that the physical environment can be designed to create a sense of neighborliness among residents. It is then expected that residents will take ownership and responsibility of their common space, and be more willing to defend it. In sum, Newman's defensible space is about building community cohesion so that residents will challenge or question outsiders, this in turn can lead to a reduction in crime, disorder, and fear of crime. As noted by Newman (1972, p.1) "it is clear to almost all researchers in crime prevention that the issue hinges on the inability of communities to come together in joint action."

On the other hand, criminologists have increasingly recognized the importance of “place” in understanding the spatial and physical environmental influences on criminal and violent acts. For these studies, “it is the location and physical context of crime - not the socio-demographic characteristics of the offenders - that acquire significance. Of particular interest are place characteristics (land use, built-form condition, visibility levels), as well as a site’s access characteristics” (Liggett, Loukaitou-Sideris, Iseki, 2000, p. 20).

Given that, the design and layout of the physical environment can be conducive to violent crime or can reduce opportunities for criminal actions. It is important to understand the various physical features that can encourage or discourage gun violence. Several theories provide the basis for examining the relationship between the built and physical environment and gun violence. Specifically, defensible space (Newman, 1972), crime prevention through environmental design (Jeffrey, 1971, Crowe, 1991), situational crime prevention (Clarke, 1983), rational choice perspective (Clark and Cornish, 1985), routine activity theory (Cohen and Felson, 1979) and crime pattern theory (Brantingham and Brantingham, 1981). Each of these theories offers a different perspective for understanding how the built and physical environment might be associated to youth gun violence in public and semi-public places. For example, according to the Rational Choice Theory (Clark and Cornish, 1985), the location of a potential target plays a role in the decision process of offenders before committing a crime. All other things being equal, offenders will choose settings that provide an easy getaway, have a quick access to public transportation; and are situated along a main street or near an intersection since these locations enhance their chances of escaping apprehension. The Routine Activity Theory (Cohen and Felson, 1979) also stresses that offenders select their target based on a variety of factors, including the location of the target and victim, easy availability to site and the lack of a capable guardian. Moreover,

Crime Pattern Theory (Brantingham and Brantingham, 1981) argues that crimes are committed in locations that an offender knows well; “one of the nodes, paths or edges that he has encountered” (Levy, 1990, p. 40).

CPTED principles are based on the assumption that most offenders are rational who will select to commit a crime in a particular location if the benefits outweigh the costs. Fisher and Lab (2010) argue that “the CPTED approach falls squarely under the purview of environmental criminology and as such is consistent with the opportunities of crime” (p. 221). On the basis of these findings, it can be concluded that the presence or absence of certain characteristics of the built and physical environment can affect the occurrence of gun violence. For example, Altizo and York, (2007) found that several characteristics such as visibility, poorly lit, the availability of viable escape routes, poorly designed fencing or landscaping can make a store a more attractive target for robbery.

On the other hand, CPTED has drawn several criticisms. Schneider and Pearcey (1996) note that “because CPTED attempts to intervene directly in the opportunistic portion of the criminal process, it does not purport to develop crime prevention solutions in a broad universe of individual and social behavior, but rather its solutions are limited to variables that can be manipulated in the specified relationship between human behavior and the physical environment. As such, CPTED is not concerned with addressing the root cause of crime” (p. 10). As a result, the possibility of crime displacement is one of the most common criticisms leveled at CPTED. In the case of youth gun violence, the concept of displacement assumes that modifying the physical environment may simply displace gun shooters to another area that has had no crime intervention. However, the displacement research has produced inconsistent results. (see, e.g., Eck, 1993; Guerette and Bowers, 2009; Clarke, 2004; Hesseling, 1994). Saville (1998) suggests that “displacement can be utilized as a positive tool, rather than as a negative side effect. This can be achieved by monitoring the wider environment and

considering and planning against the possible knock-on effects of CPTED initiative” (as cited in Cozen et al. 2005, p. 342). Another criticism levelled at CPTED is that not all criminals act rationally, studies have shown that chronic serious offenders do not always act rationally; psychotropic drugs or alcohol may influence their behavior. In addition, research shows that chronic offenders are often impulsive, reactive, and do not anticipate the consequences of their actions. Thus, there is a possibility that irrational offenders may not be deterred by CPTED strategies or crime prevention initiatives (Cozen et al. 2005). Despite these and other criticisms, “there is a growing body of research that supports the assertion that crime prevention through environmental design is effective in reducing both crime and fear of crime in the community” (Cozen et al. 2005, p. 328).

## **CHAPTER 3 RESEARCH DESIGN**

### **3.1. Introduction**

This chapter outlines the research design for this study. Specifically, the aim of this chapter is to describe the research methodology used to collect primary data that facilitates a description and analysis of the predominant physical and design characteristics of sites where youth shootings took place in the HRM. This chapter discusses the key methodological aspects that were employed in this study. This includes the rationale behind the methodological approach that was employed in the study, the specific methods and instruments that were used to collect data, as well as the statistical techniques used to analyze the data. Finally, this chapter presents the strengths and limitations of the research design

### **3.2. Selection of the Study Area**

The Halifax Regional Municipality can be considered to be an important case study for examining gun violence because it is “information-rich.” as indicated earlier, the HRM has consistently had one of the highest violent crime rates in the country. In 2011, there were 17 homicides in the HRM, the most ever recorded for the amalgamated city. That same year, there were 75 shooting incidents in HRM, which meant there was one shooting every 4.8 days (CBC News, January 17, 2012). In light of this, “Halifax police acknowledge gun violence is a growing concern ... (CBC News, July, 2012). In 2006, Halifax had the highest rate of gun-related robberies in Canada accounted for nearly 16 percent of all HRM robberies (The Daily, February, 20, 2008). From 2004 to 2012, homicide involving a firearm accounted for approximately 35 percent of all HRM homicides, whereas, from 2006 to 2012, attempted murder committed with a firearm was 60 percent. These findings indicate that firearm is one of the most dominant weapons

used for committing violent crimes such as homicides and attempted murders. The HRM is also “home to small gang centered in the drug trade and accountable for a number of retaliatory murders and public-frightening drive-by shootings” (Clairmont, 2008, p. 22).

### **3.3 Phases of the Primary Research**

The secondary and primary research for this thesis entailed five sequential phases. The first phase involved a review of the scholarly literature that included identifying empirical and theoretical literature on youth- and gang-related violence as well as theories related to the relationship between the physical and built environment, on the one hand, and criminal and violent incidents (including youth-related gun violence) on the other. In the second phase, case studies involving public youth-related gun violence in the HRM were identified with the goal of collating a sample, the sample to be used for the primary data collection. The third phase involved the preparation, testing, and finalization of the research instruments (standardized questionnaires) to be used in the primary data collection. In the fourth phase, data was collected by administering the questionnaire at sites where youth-related gun violence took place in order to identify the salient characteristics of the physical and built environment. The fifth phase of the research involved the collation and analysis of the data using descriptive statistics in order to identify predominant the design features of the built and physical environment where shootings occurred.

### **3.4. Sample Selection**

The primary research for this study employed quantitative methods that involved the use of a standardized questionnaire to collect data on the characteristics of the built and physical environment where gun violence by youth took place in the HRM. The case studies compiled for the sample were identified from news media reports and police

media reports for five shooting incidents: drive- by shooting, gunfire, robbery/break-ins, homicide and attempted murder. The researcher identified youth-related shootings through news media articles from Eureka newspaper database of Halifax media outlets (*Halifax Chronicle-Herald, Halifax Daily News* and *Metro News*) from January 2007 to December 2012 and from the Halifax Regional Police website covering the period January 2012 to December 2012. This period was selected for this study, to ensure that the researcher had sufficient available data to conduct the research. Using a purposive sampling technique, 36 shooting incidents were selected that satisfied three basic criteria. First, information was available on the individual who was responsible for the shooting, including his or her age. Second, the shooting was perpetrated by a youth or young adult between the ages of 12 and 24 years. According to Dauvergne and De Socio (2008), juveniles (age 12 to 17 years) accused of committing a violent crime are more likely than adults to use a firearm while Clairmont (2008) argues that young adults between the ages of 19 and 24) are disproportionately involved in violence and crime, whether as offenders or victims. Third, there must be a specific location/ address of the shooting site or the site must be located within a specific city block. For each shooting incident, the following data were collected from available sources:

- Police file number (if known)
- The age of the offender(s)
- The year, month, day and time the actual crime was committed
- Number of offenders apprehended (this was coded as either an individual act or collective behavior)
- Specific location/address of the incident



- The criminal context of shooting, which was coded as follows: (1) drug- related, (2) gang-related, (3) random shooting act, (4) not a random shooting, (5) unknown.

### **3.5 Collection of Data on the built and Physical Environment where Shootings Occurred**

Data on the built and physical environment where shootings took place were collected through the use of a standardized questionnaire that itemizes the physical and design characteristics of locations where shootings have taken place. More specifically, the physical and design characteristics emphasized in the questionnaire were informed by the theoretical framework used for this study; that is, theories and empirical research related to the relationship between the physical and built environment, on the one hand, and criminal incidents (and public gun violence) on the other. The standardized questionnaire was also informed by existing safety audit checklists that also reflected this study's theoretical framework and CPTED in particular. Safety audit checklists seek to identify and describe features of existing built environment that influence people's perception of safety and risk of crime, and provide a structured process for assessing particular locations against CPTED principles (Barlett, 2001, p. 22). Prior to the formal collection of data, a pilot study was conducted by visiting several of the sampled sites and administering the checklist. The checklist was then revised. Once the sample had been compiled and the questionnaire tested and revised, the questionnaire was administered through visits to and observations of the salient characteristics of the sites contained in the sample. Observational data recorded on the questionnaire for each site was supplemented by digital photographs and videos taken at each site. The questionnaire was administered between November and December 2013 between the hours of 8:00 a.m. and 6:00 p.m.

### **3.6. Data Analysis**

To identify the predominant characteristics of sites where shootings took place, this study relied on the use of descriptive statistics, and more specifically the frequency with which the design characteristics described above were present at each of the sites. According to Healey and Prus (2010) “frequency distributions are tables that summarize the distribution of a variable by reporting the number of cases contained in each category of the variable” (p. 33). The frequencies were produced using SPSS software.

### **3.7. Limitations of the Study**

There are a number of limitations of this study. The first limitation of the study is the use of a non-probability sample (i.e., purposive sample). This could restrict the generalizability of the research findings. A second limitation was the use of the news media as the basis to compile the sample. As in all studies that are based on crime data, they are subject to under-reporting and over-reporting in the news media. Another limitation of the study is the problem of accuracy related to human error of documenting crimes or preciseness of location of where crime occurs. The shooting addresses reported by the police may not always be accurate. For example, there may be slight variations in the description of addresses reported by witnesses. While this limitation may affect nonfatal injuries committed with a firearm, it does not apply to homicide data since it involves death of the victim and immediate police attention. Fourth, this study focuses on how the physical environment influences criminal and violent behavior and does not take into consideration (nor does it statistically control for) social environmental variables that research shows greatly influence crime and violence within a particular locale. A fifth limitation is that for some sites, data were collected years after a shooting took place, which means that some environmental characteristics may have changed during the intervening period. A sixth limitation is the relatively small sample size, which

may affect the reliability of the findings of this study. Finally, it should be noted that this study does not attempt to establish a causal relationship between certain features of the physical and built environment, on the one hand, and youth gun violence. Instead, it is primarily concerned with identifying predominant features at sites in the HRM where shootings took place.

## CHAPTER 4

### RESEARCH FINDINGS, DISCUSSION, AND ANALYSIS

#### 4.1 Introduction

The aim of this chapter is to present, discuss and analyze findings of the primary research. In particular, the findings from the site assessment survey are presented with the goal of exploring the predominant physical characteristics of sites where youth shootings took place in the HRM. This analysis will be conducted primarily through the use of descriptive statistics, and more specifically, the frequency with which certain physical design characteristics were identified at the shooting sites. The analysis will also be guided by and juxtaposed against the theoretical framework described earlier in this thesis, which is concerned with how the design of the physical and built environment can promote or inhibit the opportunities for criminal acts to occur in a particular time and place. In other words, the discussion and analysis will largely consist of comparing and contrasting the research findings of this study to the extant literature with a view to determining if the findings are supportive of or contradict the extant literature. This chapter is demarcated by the following physical environmental attributes of sites where shootings took place:

- 1) Location/Surrounding environment (the design of the location and characteristics of the surrounding area)
- 2) Site Permeability (the degree to which spaces can be accessed by people; that is the extent of access and egress control)
- 3) Surveillance (the features of the built and physical environment that promotes or hinders surveillance by residents and other legitimate users of that space).
- 4) Image (the overall appearance, conditions, and upkeep of a site).

## **4.2 Location/Surrounding Environment**

According to the literature, the choice of a potential target by an offender may be influenced by a number of locational factors. Brantingham et al. (2009) argue that certain places “can attract intending offenders, that is serve as crime attractors, or can serve as crime generators simply by attracting large volumes of people including some who commit opportunistic crimes” (p. 89). In other words, some places have the tendency to create opportunities for crime and criminal behavior by attracting both victims and offenders. The clustering of crime at certain places or hotspots is well documented in the literature (Caplan 2011). Although no universal definition of the term exists, the common understanding is that “hotspots are geographic locations/areas where a high level of crime concentration can be found relative to level of crime at other locations/areas” (Iseki, 2006, p. 18).

A number of studies have empirically linked certain type of land-uses with higher levels of crime in the surrounding area: Xu et al. (2010) examined the spatial distribution effects of three urban features (bus stops, middle and high schools, and public housing) acting as generators of gun shooting in Newark and Irvington, NJ. They found that gun shootings are not randomly distributed throughout a terrain; but rather, are concentrated in a statistically significant way around certain facilities such as middle and high schools, bus stops, and public housing . In another study, Caplan, (2011) note that places such as bars, clubs, restaurants, and liquor stores are considered attractors or generators of shootings since these locations attract large numbers of people, which" would present potential offenders with suitable targets. Bernasco and Block (2011) add that “proximity of place to crime attractor or generator may increase the amount of crime in that place because it is located on the paths that lead toward and from the crime attractor or crime generator” (p. 37).

Additionally, studies have found that the rates of gun violence are generally higher at public housing sites than other areas. Drucker (2011) found that residents of public housings are twice more likely to be victims of gun violence than individuals who do not reside in public housing facilities. Other studies have also indicated that public housing developments experience more violent offenses in comparison to non-public housing developments (Dunworth & Saiger, 1993; Fagan & Davies, 2000; U.S Department of Housing and Urban Development (HUD), 2000). Moreover, a number of studies have indicated that many of the crimes (e.g. homicide) in and around public housing are more likely to be committed by outsiders (Popkin et al., 2000; Zelon et al., 1994; Griffith and Tita, 2009). According to the “design hypothesis, the built environment of public housing also increases opportunities to offend, resulting in higher offending rates among public housing residents compared to outside public housing” (Griffith and Tita, 2009, p. 474). They further note that the high rate of violent crime in public housing is due to “the combination of a built environment that inhibits social control and a social environment that limits social interaction between residents and the broader society (p. 475). Furthermore, studies on public housing and architectural design have identified the size of the building (high, townhouse, low-rise or scattered site) and type of building (Newman, 1972, 1996; Newman and Franck, 1980; Holzmann et al., 1996; Zelon et al., 1994); low illumination after dark and unguarded public and semi-public space (Griffith and Tita, 2009) as criminogenic factors of public housing. However, it is important to note that in addition to the physical design, high rates of crime in public housing is also attributed to several factors in the social environment (Don et al, 1999, as cited in Griffith and Tita, 2009).

This section discusses and analyzes the research findings with respect to aspects of the location and surrounding environment of sites where shooting took place.

Table 4.1 presents the descriptive statistics on the frequency of individual variables that were measured as part of this category.

**Table 4.1: Locational Characteristics of Shooting Sites**

<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Near an intersection	<b>Yes</b>	28	77.8
	<b>No</b>	8	22.2
Near a public transportation stop	<b>Yes</b>	19	52.8
	<b>No</b>	17	47.2
Near a freeway exit	<b>Yes</b>	3	8.3
	<b>No</b>	33	91.7
Near or on a major road (more than 50 cars per hour)	<b>Yes</b>	15	41.7
	<b>No</b>	21	58.3
Corner lots	<b>Yes</b>	10	28
	<b>No</b>	26	72
Any establishments or facilities adjacent to the site that may serve as a crime generator	<b>Yes</b>	19	52.8
	<b>No</b>	17	47.2

As illustrated in Table 4.1, of the 36 shooting incidents examined in this study, the majority (77.8%) occurred near an intersection. More specifically, the sites where shootings took place were more likely to be located near or on cross intersections (47.2%), followed by three-way intersection (30.6%). The literature suggests that this may be the case because intersections maximize the availability of escape routes. At the very least, the presence of an intersection nearby may create “releaser cues” to offenders that they have more escape routes available to them. Another salient finding indicates that 75 percent of burglaries that involve a shooting occurred near an intersection. Geason and Wilson (1989) argue that residences located at an intersection are more susceptible to burglary than those residences situated on cul-de-sacs because the intersection offers more escape routes for criminals.

Just over half of the shooting sites (52.8%) were close to a public transportation stop. This is consistent with previous research from Levy (2009), who notes that the

“residential and commercial locations near transit stops and hubs experience an increased amount of crime compared to similar establishment not located near transportation” (p. 21). Smith and Clarke (2000) add that the crime rate tends to be higher in areas with public transit stops.

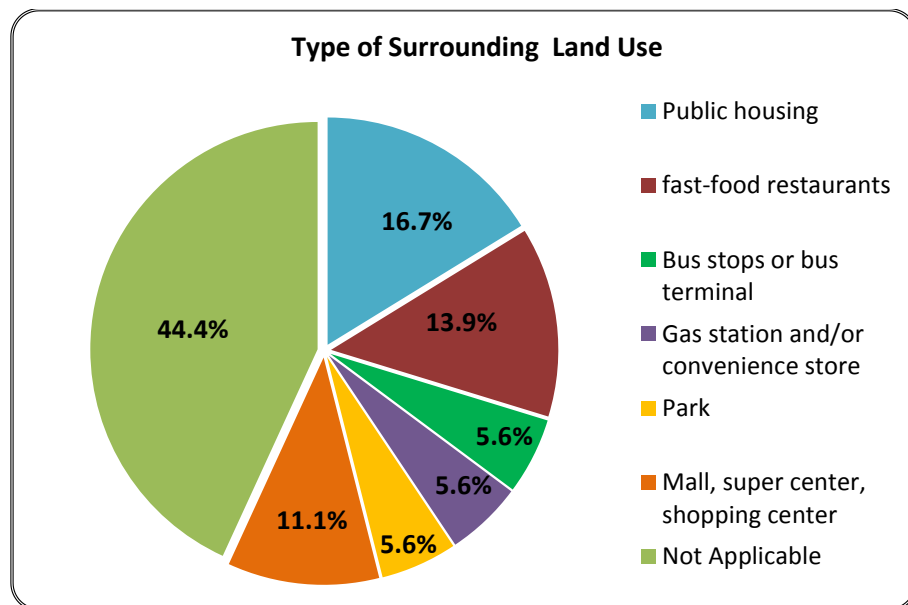
Only three of 36 shooting incidents (8.3%) took place near a freeway exit, while 41.7 percent of all shooting locations were on a major road. In contrast, Brantingham and Brantingham (1981) argue that offenders tend to target locations close to major transportation arteries and highways since the “proximity to major roadways may facilitate access to and from the shooting location” (Dedel, 2007, p. 8). Duffala (1976) also found that armed robbery tends to occur at convenience store and gas station that are located near major streets. He concluded that “when viewed in interaction with each other, proximity to a major transportation route, amount of street traffic, land-use patterns, and surrounding commercial activities were all highly significant in terms of explaining the fact that twelve of the convenience stores were robbed three times or more” (p. 244-245). Other studies have indicated that offenders look for heavily traveled streets and locations near major highways where there are many potential victims and where they can easily escape. The findings of this study contradict these studies because only a small proportion of the shootings occurred on what could be considered major streets in the HRM (more than 50 vehicles per hour). With that said, the findings of this study suggest that certain type of shooting incidents such as drive-by shootings and gunfire are more likely to occur on major roadway, since they may allow shooters to approach without detection and to escape unhindered.

Most of the sites where shootings took place were not corner lots. This finding contradicts the work of Brantingham and Brantingham (1978); Luedtke and Associates (1970), and Reppetto (1974). These authors found that residences or retail stores located near or on a street corner tend to have a higher crime rate. Some possible



explanations for why the findings of this study do not correspond to findings of the extant literature include: (1) several of the sites sampled in this study did not have the exact address of where the shooting took place; instead they were based on estimation (within one block), (2) the study used a small sample size, and (3) only 12 of 36 shooting incidents identified in this study were reported as robbery/break-ins, which is significant because the extant literature indicates that corner lots are at a particularly high risk of residential burglary compared to those in the interior of a block (Nasar 1981; Hakim, et al., 2001; Weisel, 2002).

Nineteen shootings (52.8%) took place adjacent to establishments that can be considered a “crime generator” .This research also found that certain types of land uses that the literature deems “crime generators” – in particular, public housing, fast-food restaurants, malls, shopping centers, park, gas stations and convenience stores – may act as generators for shooting.



**Figure 4.1: Establishments or facilities adjacent to where the shooting occur that may serve as a crime generator**

Prior research has confirmed that the proximity of place to a crime attractor or generator may increase the amount of crime in that location since it provides opportunity for both victims and offenders to meet while conducting their normal daily routines (Bernasco and Block, 2011; Roncek and Meire, 1991; Block and Block, 1995; Sherman et al. 1989; Caplan, 2011; Xu et al., 2010; Xu, 2011; Iseki, 2006). Loukaitou-Sideris et al. (2001) note that “specific commercial uses are more likely to generate crime than others, especially if there is high concentration of them in a limited area” (p. 7). With respect to gun violence, studies have found that the number of establishments (liquor stores, bars, and taverns) that is present in an area can influence violent crime, particularly youth and gang related crime. This may be due to the fact that many of these establishments are located at major intersections, especially intersections of grid and diagonal streets, alleys, near freeway exits and public transport hubs, which provide convenient access and escape (Loukaitou-Sideris, 2001, Wortley, 2011, Block and Block, 1995). Researchers have found that the rates of gun violence are generally higher at public housing sites than other areas (Xu et al. 2010; Drucker, 2011; U.S Department of Housing and Urban Development, 2000; Fagan and Davies, 2000; Griffith and Tita, 2009; Dunworth and Saiger, 1993).

In conclusion, the predominant variables related to the location and surrounding environmental characteristics of a site where a shooting took place include proximity to an intersection, public transportation stops, and crime generators such as public housing, fast-food restaurants, malls, and parks. This evidence appears to support place-based opportunity theories of crime, which argue that offenders either choose site locations, or conversely, find themselves naturally at activity generators as part of their daily routines. However, the nature of this study, and the use of descriptive statistics in particular, militates against establishing a causal relationship between the location and

surrounding characteristics of a site, on the one hand, and the decision-making process of an offender on the other.

### **4.3 Site Permeability**

The permeability of a site deals with the ease with which people can enter and/or exit a particular space. The literature identifies the ease and rapidity with which one can access and egress a site as a factor that can influence the opportunity for a criminal act to occur in a particular time and place. Similarly, access and egress control refers to any crime prevention measure that somehow regulates and limits who can enter (and exit) a certain area (including where and when they are allowed to enter or exit), with particular emphasis on restricting access only to those who have a legitimate reason to be in a particular area (Lab, 2004, p. 38). In the context of public spaces, access and egress control does not necessarily restrict someone from entering an area, but limits the number of ways to enter and leave.

The extant literature indicates that areas with numerous entry and exit points will experience higher crime rates. Watkins et al. (2000) argue that the design of a street may influence criminal events through the degree of accessibility that a potential offenders have to an area. Loukaitou- Sideris et al. (2001, p. 8) add that “the greater number of escape routes, (streets and alleys) in the vicinity of a site, the easier is for a criminal to escape.” Other studies have also supported the notion that a higher degree of accessibility to a site is associated with higher crime rates (Eck and Weisburd, 1995; Clark, 2004; White, 1990; Beavon et al., 1994; Buck and Hakim, 1991; Bennett and Wright, 1984; Molumby, 1976). Additionally, studies on access control (Newman, 1973, 1980, 1996; Coleman, 1985; Poyner and Webb, 1991) have reported a link “between design features and levels of crime; particularly features that allowed uncontrolled

pedestrian movement through residential complexes” (as cited in Cozens, et al., 2005, p. 335).

In the literature concerning environmental factors associated with shootings, the accessibility of the target has been strongly emphasized as a mediating factor. Research has indicated that shootings tend to be higher at locations that are most accessible to outside traffic (Rubenstein et al., 1980). Prior research has indicated that the type of street layout can affect drive-by shootings. Squires (2011) found that drive-by shootings tends to occur at street corners, which, “from a practical perspective, are optimal places for gangs to gather for simple physical reasons, including visibility of all approaching pedestrian and vehicular traffic, and perhaps weaker resident-based surveillance of gang members” (Taniguchi, Radcliffe and Taylor, 2011, p. 2). This creates what Atlas (2013) referred to as an offensible space. An offensible space is an area in which criminal successfully use defensible space features and CPTED strategies to carry out illegal activities (Atlas, 2013). He further adds that “the most common location for an offensible space is an apartment or building on the corner. The corner vantage point allows better surveillance on who is approaching the building” (p.107) as well as providing easy escape routes in case of enforcement activity. In addition, in his study, Atlas (2002, p. 106) highlighted several access control features that criminals use negatively to conduct crime, such as, screening people, installing windows with iron bars or security devices, and “using deadbolts, peepholes, and security gates to screen individuals, to determine who had access to the crime site.”

Moreover, Dedel (2007) posits that drive-by shootings are most likely to occur in wide-open streets “because they allow the shooters to approach without detection and to escape unhindered” (p. 8). Thus, she argues, “when drive-by shootings are concentrated in a specific geographic area, closing streets that provide access to the neighborhood can reduce the ability of potential offenders to carry out drive-by shootings. These

closures block entry points and escape routes, forcing offenders to take a more circuitous route to their destination and often requiring them to backtrack to leave the area” (p. 21). This was also supported by Clarke (2004) who adds that closing street and alleys can prevent drive-by shootings since cars would not be able to easily enter a street, therefore they would have to backtrack to escape, exposing them to retaliation from those shot at. Drive-by shootings and attempted murder are likely to be more prevalent on highly accessible streets where there are numerous entry points, greater volumes of traffic, increased speed limits and more potential targets (Watkins, 1998). In Los Angeles, in 1990, traffic barriers were placed in neighborhoods that had experienced the city’s highest level of drive-by shootings, gang homicides and street assaults in an effort to block access to the neighborhood by rival gangs, thereby reducing the ability of potential offenders to carry out- drive-by shootings. After comparing crime levels before, during and after its two years of operations, findings revealed that homicides and aggravated assault were reduced and that crimes were not displaced to other areas (Lasley, 1998). Lasley further notes that “the barriers change the situations in which gangs perceive opportunities to carry out “hit-and-run” crimes such as drive-by shootings” (p. 2). Other studies have found that closing off streets reduces crime (Zavoski et al. 1999; Eck, 2002). Atlas Le Blanc (1994) reported a significant reduction in burglary in a community in South Florida after the implementation of street closures and barricades ( as cited in Cromwell and Olson, 2006).Based on these findings it can be argued that, there is a greater chance for shooting to occur in street and areas that permit easy ingress and egress, compared with areas that have more restricted access and complicated street layouts.

Bevis and Nutter (1977) compared the residential burglary rate of various street layouts in Minneapolis. They note that cross intersections are more accessible to offenders, while “T” and “L” intersection are considered less accessible and cul-de-sacs

the least accessible. They concluded that the rates of burglary will be lower in areas that have inaccessible streets layouts. Taylor and Gottfredson (1986) add that crime rates will be higher in areas that have two-way streets rather than one way street, cul-de-sacs or “T” intersections. They further state that permeability is essential to potential offenders because it reduces entry and exit time, thus decreasing their chances of detection and apprehension. Brantingham and Brantingham (1981, p. 51) notes that, “areas with grid networks have higher potential crime rates than areas with organic street layout.” This is because gridded networks are more predictable and provide easy entry and escape for potential offenders than areas with winding roads, cul-de-sac, or dead-ends, where an offender can easily become confused or get lost (Loukaitou- Sideris et al, 2001, Brantingham, 1981, Schneider and Kitchener, 2007). Furthermore, there are on-going debates surrounding the impact of connectivity on levels of crime. Cozen and Hillier, (2008), Schneider and Kitchener, (2007), and Armitage, (2011) have reviewed the issue of permeability and crime. These authors cite a number of empirical studies, which indicate that increased level of permeability/connectivity contributes to higher levels of crime (Rubenstein et al., 1980; White,1990; Poyner and Webb, 1991; Rengert and Hakim,1998; Hakim et al, 2001; Van der Voordt and Van Wegen, 1990; Nubani and Wineman, 2005; Wagner, 1997; Beavon et al., 1994; Taylor, 2002; Armitage, 2006; Mirlees-Black et al., 1998; Yang, 2006; Clontz et al., 2003). Conversely, a number of studies that used space syntax measures have found “that increased levels of permeability have a beneficial impact upon crime” (Rudlin and Falk, 1995; Jones and Fanek, 1997; Hillier and Shu, 1998, 2000; Shu, 2000; Shu and Huang, 2003; Hillier, 2004; as cited in Armitage, 2011). It is important, to note however, that the majority of these studies dealt with burglary versus violent crimes.

Table 4.2 summarizes the findings of this study related to the ease to which pedestrians and vehicles can enter and exit sites where shootings took place. This table

contains the frequencies and percentages for both pedestrian and vehicular movement to and from the shooting sites identified in the research.

**Table 4.2: Site Permeability: Pedestrian and Vehicular Access and Egress**

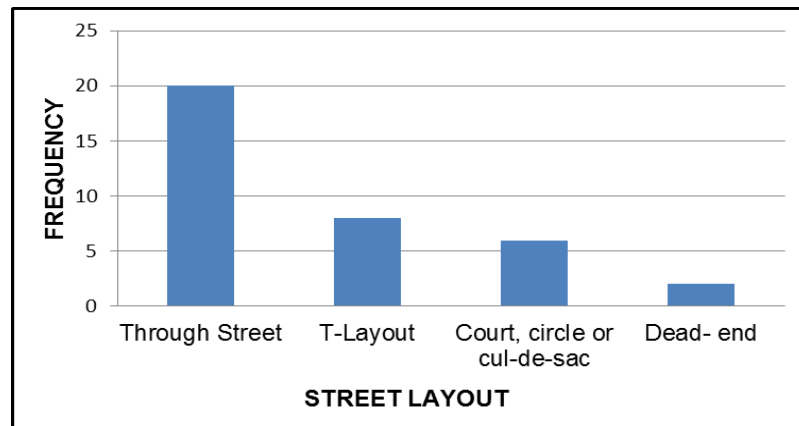
Variables ( N=36)	Coding	Frequency (n)	Percentage (%)
Easy (uncontrolled) access to the site by cars	<b>Yes</b>	24	67
	<b>No</b>	12	33
Easy (uncontrolled) egress from the site by cars	<b>Yes</b>	20	55.6
	<b>No</b>	16	44.4
Blocks have street design characteristics to reduce volume or speed (e.g. roundabout) to the site	<b>Yes</b>	10	28
	<b>No</b>	26	72
Easy (uncontrolled) access to the site by pedestrians	<b>Yes</b>	30	83.3
	<b>No</b>	6	16.7
Easy (uncontrolled) egress from the site by pedestrians	<b>Yes</b>	30	83.3
	<b>No</b>	6	16.7
Any form of access control to the site	<b>Yes</b>	9	25
	<b>No</b>	27	75

The findings of this study appear to be consistent with both the theory and empirical research on site accessibility in public areas, and in relation to public streets specifically. As Table 4.2 shows, the majority of shootings (66.7%) occurred at sites that can easily be accessed (i.e., uncontrolled access) by cars, while 55.6 percent occurred at sites that had easy (uncontrolled) egress by cars. In the case of pedestrian movement, 30 sites (83.3%) were characterized by environmental features that promoted unrestricted access and egress. This research also reveals that only a few (28%) of the blocks had street design characteristics such as speed humps, chicanes, speed limits and other traffic calming devices that could potentially serve to control unfettered access by automobiles to a site.

Only nine sites (25%) where shootings took place had some form of access control or target hardening. The form of access control/target hardening that were visible at these sites were open fencing (e.g. chain link fence, wrought iron gate), a physical

barrier (e.g. high walls), or an alarm system. It is unknown whether those methods of access controls were present at the time a shooting had occurred.

This research also found that sites situated on a one-way street did not experience many shooting incidents (8.3%), while the number of shootings on two-way streets (13.9%) was not that much higher. Furthermore, Figure 4.2 shows that 55.6 percent of shooting incidents took place on a “through street.” In contrast, street designs that had more restrictive access and egress opportunities experienced fewer shootings; in particular, only 16.7 percent of shootings occurred on circle or cul-de-sac streets while dead-end streets had the least amount of shooting incidents (5.6%). The relatively lower number of shootings on circle, cul-de-sac, or dead end streets, however, may be because, in the HRM, there are fewer types of these streets compared to through streets.



**Figure: 4.2 Street layout where shooting took place**

In summary, the findings of this research indicate that there was a greater frequency of shootings on through streets (compared to cul-de-sacs or dead ends), as well as streets that had minimal access control of traffic calming measures. However, due to the limitation of the data and the lack of rate calculation, this study has no way of knowing what the rate of shootings are on cul-de sac, or one-way, or intersection design. With that said, this research infers the possibility that the extant literature might be



correct, which suggest that the probability of a crime will be higher on streets that are more accessible, (that is, have minimal access and egress control features) (Lab, 2000; Bevis and Nutter, 1977; Taylor and Gottfredson, 1986). However, no causal relationship can be established with the data at hand.

#### **4.4 Surveillance Opportunities**

This section details the research findings with respect to how the design of the sites where shootings took place facilitates or hinders surveillance opportunities by legitimate users. Surveillance may very well be the most effective human-based method of increasing the chance that an offender may be detected. Surveillance simply means introducing or increasing opportunities for the legitimate users of a space — such as neighborhood residents, retail storeowners, passers-by, security guards, or police — to monitor that space, observe suspicious people and activities, and then take action (Crowe, 1991; Lab, 2000). The fundamental assumptions underlying surveillance are that: (1) legitimate users of a space will be more likely to notice intruders and (2) potential offenders will be deterred from these sites due to the risk of being caught.

Natural surveillance is a core CPTED principle (Subbaiyan and Tadepalli, 2012) and is defined by Newman (1972, p. 50) as “the capacity of the physical design to provide surveillance opportunities for residents and their agents” during the normal course of their daily activities. Natural surveillance (also called “passive” or “informal” modes of surveillance) can be encouraged through the design of the physical environment so that legitimate users of that space can see and be seen. For example, this can be achieved through the use of design features such as doors and windows that look onto streets and parking areas, adequate street lighting, pedestrian friendly sidewalks and streets to maximize the visibility of people, property or buildings. Studies have indicated that crime can be prevented in spaces where there are ample

opportunities for natural surveillance (i.e., where people can see and be seen during their routine activities in that space). This is because there is a greater probability that undesirable behavior will be deterred or an offender will be caught in the act (Subbaiyan and Tadepalli, 2012; Reynald, 2011; Crowe, 1991; Lab, 2000; Cozen et al. 2005; Weisel, 2002; Pascoe, 1993; Cozens et al, 2001; Stevenson, 1996). Sorenson (2003) notes

Burglars avoid targets easily observed by neighbors or passers-by. Therefore, houses in isolated areas, those set back from the road, and those on large plots of land next to parks or other non-residential areas are more highly at risk. Properties characterized by low levels of night-time lighting, high fences, or thick trees or shrubbery provide cover – which is especially attractive when found near potential access points like doors or windows (p.19).

This study collected data on whether the physical design of a shooting site maximizes (natural) surveillance opportunities for legitimate users. Natural surveillance (i.e. presence of people, clear visibility, lighting and street lighting); artificial surveillance (i.e. CCTV camera) and organized surveillance (e.g. security guard, police patrols), and entrapment areas/potential hiding spots were the variables measures to determine the level of surveillance at shooting sites.

**Table 4.3: Design that Promotes Opportunities for Surveillance in General**

<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
In general, does the physical design maximize (natural) surveillance opportunities for legitimate users of the space?	<b>Yes</b>	16	44.4
	<b>No</b>	20	55.6

Overall, as indicated in Table 4.3, the research findings indicate that the design features for a slight majority of the sites (55.6%) hinder natural surveillance opportunities for legitimate users of these sites. This was due to design features that are not consistent with CPTED principles, as presented in Table 4.4.

**Table 4.4: Design that Promotes Opportunities for Natural Surveillance**

<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Windows overlooking sidewalks and streets are clear of obstructions	<b>Yes</b>	17	47.2
	<b>No</b>	19	52.8
Windows on all sides of the building provide full visibility of the property	<b>Yes</b>	16	44.4
	<b>No</b>	20	55.6
Fencing allows natural surveillance from the street to the building?	<b>Yes</b>	4	11
	<b>No</b>	8	22
	<b>NA</b>	24	67

Reynald (2011, p. 25) argues that “visibility is therefore the critical element underlying the mechanism of natural surveillance.” Sorensen et al. (2008) add that surveillance can be promoted by ensuring that windows of surrounding buildings face public space, lighting is adequate, trees and shrubs are not overgrown, and that there is removal of physical structures which provide hiding places. Studies have indicated that a clear and unobstructed line of sight from the residence to the street can enhance natural surveillance and reduce the opportunity for crime (Taylor and Gottfredson, 1986; Reynald, 2011).

As Table 4.4 demonstrates, while the majority of buildings located at the sites in the HRM where shootings took place were facing towards the streets (which according to CPTED practice should encourage surveillance), 52.8 percent had windows that were completely or partially obstructed by the presence of tall bushes, trees, parked vehicles, shrubbery, merchandise, objects and other items. According to Clontz (1995, p. 128), the obstruction of windows may “contribute to the difficulty or ease with which a potential offender or a crime in progress can be detected.” This finding is supported by Crow and Bull (1975) and Jeffrey et al. (1987). These authors found that stores with obstructed windows increase the risk of robbery. In a study conducted by Cromwell and Olson (2006), burglars reported that the location and type of windows both at the target site

and neighbor's house; and properties with dense shrubbery near windows and doors are important factors that they considered in their target selection process. Of the 12 HRM properties identified in this study that had fences, eight of them did not allow a clear view of the front and sides of a dwelling.

Additionally, finding reveals that 55.6 percent of all properties did not have windows on all sides of the building to allow residents to view surrounding areas. In other words, a number of sites did not provide ample opportunities for residents to view neighbors or passerby on at least one side. This can reduce the chances of offenders being detected by residents and passers-by in the area thereby making the area more susceptible to criminal victimization. This is important because Wright and Decker (1994) note that burglars preferred to enter the rear of house since according to them: "you don't find too many potential onlookers on the back, you mostly find them on the front" (as cited in Cromwell and Olson, 2006, p. 50).

Findings from this study do demonstrate that there are other design features of several sites that do conform to CPTED principles as far as promoting natural surveillance is concerned. As depicted in Table 4.5, this study found that the front door, parking areas, and driveways were, for most part, visible from inside a dwelling or from the street. Also noteworthy is that most properties (67%) had an outside light at the front door or entrance.

**Table 4.5: Design that Promotes Visibility**

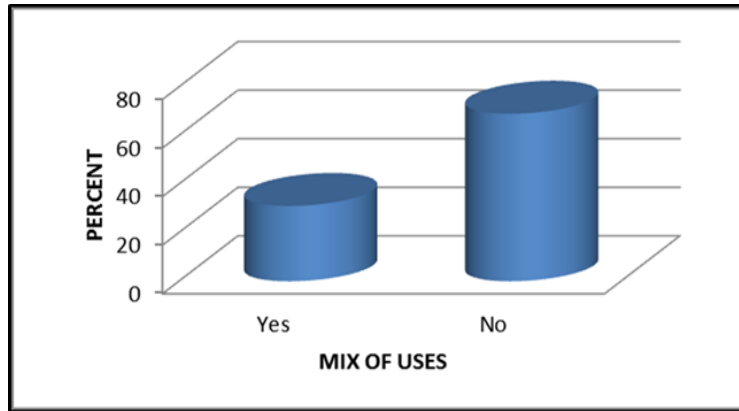
<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
The design of the site ensures clear sightlines and visibility for legitimate users	<b>Yes</b>	17	52.8
	<b>No</b>	19	47.2
The front door is clearly visible from the street or by neighbors, and driveway	<b>Yes</b>	26	72
	<b>No</b>	4	11
	<b>NA</b>	6	17
The driveway is visible from either the front or back door and at least one window	<b>Yes</b>	9	25
	<b>No</b>	1	3
	<b>NA</b>	26	72
Parking areas are visible from windows, doors and streets and do not hinder natural surveillance	<b>Yes</b>	17	47
	<b>No</b>	6	17
	<b>NA</b>	13	36
There is an outside light at the front door or entrance	<b>Yes</b>	24	67
	<b>No</b>	8	22
	<b>NA</b>	4	11
There appear to be sufficient Street lighting on the site	<b>Yes</b>	24	67
	<b>No</b>	12	33

One important design feature that maximizes surveillance on streets is lighting. Street lighting may improve visibility, which will increase the likelihood that crime will be observed. In this respect, lighting reinforces surveillance as a means to prevent crime through detection and deterrence. Research has shown that street lighting can contribute to reducing criminal incidents (Pease, 1998; Girard, 1982; Cozens et al., 2003). Welsh and Farrington (2002) conducted a systematic meta-analysis of the effects of improved outdoor lighting in England and the United States. Thirteen improved lighting programs were included in the evaluation criteria. The results showed that crime decreased by 20 percent in experimental areas, compared with control areas. Studies have also found that improved street lighting can prevent violent crime (Wright, Heilweil, Pelletier and Dickson, 1974; Farrington and Welsh, 2002). Wright et al. (1974, p. 9) notes, “there is a considerable feeling that darkness hides attackers, and reduces the likelihood of witnesses, brighter illumination is thought to make street safer for

pedestrians.” In their study on the impact of street lighting on street crime in Kansas city, Missouri, Wright et al. (1974) found that lighting was more effective in reducing crimes involving violence (robbery and assault) and less effective against property crime. “Violent crimes decreased by 51.9 percent in the experimental area, compared with 7.2 percent in the control areas (p. 49).

As can be seen from Table 4.5, the findings from this study indicate that there appears to be sufficient lighting on the majority (67%) of sites where shootings took place. This would contradict the literature. However, data for this study was collected primarily in the daytime and nighttime illumination level at each site was unknown. As a result, this research cannot adequately determine whether the presence of street lighting influences shootings at all.

Jacobs (1961) argues that to maximize natural surveillance, there need to be continuous presence of people on the street (which maximizes the “number of eyes on the street”). As far as this study is concerned, this researcher observed that most sites (75%) where shootings took place had light pedestrian traffic (less than 25 pedestrians per hour. However, this observation should be considered as tenuous due to the limited time that the researcher spent at each site (typically 30 minutes to an hour). Jacobs (1961) also notes that mixed land use can encourage pedestrian traffic and hence natural surveillance. As shown in Figure 4.3, the majority (69%) of sites in the HRM where shootings took place did not have mixed land use. This may have served to reduce pedestrian traffic and natural surveillance opportunities.



**Figure 4.3: Proportion of mixed land use at shooting**

In addition to natural surveillance, “intentional surveillance” refers to technology or activities in which the sole or primary function is to watch out for criminal or disorderly acts as a means to deter such acts or to apprehend those carrying them out (Hough et al., 1980, p. 7). Citizen patrols, security guards, and surveillance cameras are all examples of intentional forms of surveillance. Welsh and Farrington (2009) note that CCTV cameras and lighting “are more effective in reducing property (especially vehicle crimes) than reducing violent crimes” (p. 8). However, they were unable to draw conclusions about the effectiveness of formal/ organized surveillance (i.e. place managers and security guard) due to the limited number of studies. They concluded that “security guards and place managers are encouraging approach for the reduction of crime (Welsh, O’ Dell and Farrington, 2010, p. 37). Other studies have found positive results after the installation of CCTV cameras (Brown, 1995; Tilley, 1993; Butler, 1994; Webb and Laycock, 1992; Poyner, 1988; Eck, 1997; Armitage et al.1999)

Table 4.6 summarizes the findings of this study with respect to the prevalence of intentional forms of surveillance at the sites where shootings took place.

**Table 4.6: Prevalence of Intentional/Artificial Surveillance**

<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Any “artificial” surveillance on or immediately adjacent to the site (CCTV cameras)	<b>Yes</b>	5	14
	<b>No</b>	31	86
Any security personnel on the site	<b>Yes</b>	0	0
	<b>No</b>	36	100
Any other personnel (parking lot attendance) on site that could, as part of their duties, undertake surveillance?	<b>Yes</b>	1	2.8
	<b>No</b>	35	97.2

Noteworthy among these findings is that very few shooting sites had any form of intentional or artificial surveillance. Only five sites (14%) had CCTV cameras, none of the sites had any security personnel, and only 2.8 percent of the sites had personnel that could, as part of their duties, undertake surveillance. The lack of intentional surveillance mechanisms at shooting sites is due, in part, to the fact that most shootings took place in residential neighbourhoods.

Another important CPTED principle for minimizing crime opportunities by maximizing surveillance is avoiding any building design or ground-level planting that may provide concealment or entrapment areas (Gonzalez, 1989). Entrapment spots are small confined areas adjacent to or near a well-travelled route that are shielded on three sides by barriers such as an elevator or an alcove (Bartlett, 2011), while potential hiding spots are areas that provide potential concealment for an offender. Molumby (1976) assessed crime in a single housing development and found that crimes were associated with opportunities for concealment. Detrick (1977) found that potential hiding place next to a door and window are associated with higher burglary rates. Clay (1972) notes that area of concealment near an apartment was positively related to fear of crime. Lin (2010) reported that the presence of shrubbery has a strong relationship with assault, robbery, theft, and total crimes. Reynald (2010) states that “burglars avoid targets that are clearly



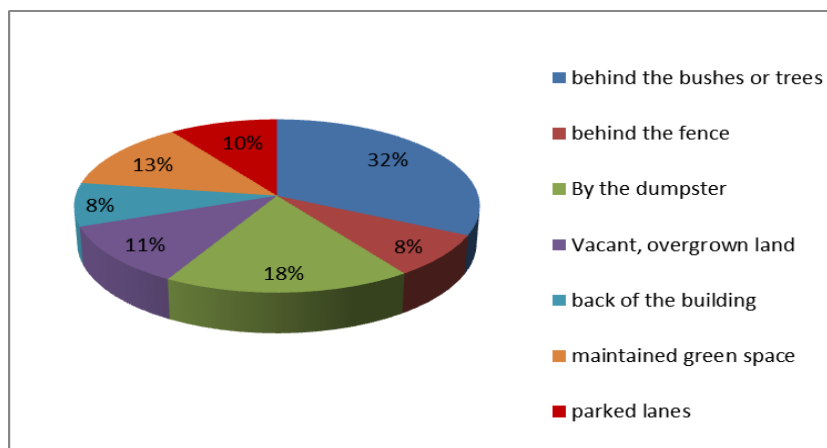
visible from neighboring properties or the public street, and are attracted to targets that provide coverage or concealment via walls, poor lighting or trees, hedges, and other plantings” (p. 71). Buck et al. (1993) examined the location of burglarized sites and found that well secluded streets – including cul-de sacs, which usually are surrounded by woods and provide cover and concealment – are favored by burglars.

Table 4.7 summarizes the findings of this study in relation to the frequency of entrapment area and potential hiding places where shootings took place.

**Table 4.7: Prevalence of Entrapment Areas and Potential Hiding Spots**

Variables ( N=36)	Coding	Frequency (n)	Percentage (%)
Are there places where someone could be hiding without you knowing it?	Yes	28	78
	No	8	22

As shown in this table, approximately 78% of sites had potential hiding places, including tall bushes, trees or fences, dumpsters, green space, vacant, overgrown land, the back of the building, and parking lanes. The frequency with which each of these potential hiding spots was identified at the shooting sites is summarized in Figure 4.4.



**Figure 4.4: Potential Entrapment and Hiding Spots**

These findings indicate that shootings occurred in locations where there were numerous

design features that provided potential hiding and entrapment opportunities. Based on this finding, it can be speculated that offenders may favour these locations since they provide opportunities to hide (i.e. these locations do not have ideal natural surveillance opportunities for residents and other legitimate users of the space).

In summary, the findings of this study provide support for the argument that limited surveillance opportunities by legitimate users of a space may create opportunities for criminal acts, and gun violence in particular. This study found that many of the shooting sites had design features that did not conform to CPTED principles as far as promoting natural surveillance is concerned (see Table 4.5). In addition, this study found that many of the sites where shootings took place did not have design features that promoted pedestrian traffic (i.e., eyes on the street) nor did they have much in the way of intentional/artificial surveillance, such as CCTV cameras or security personnel. In sum, many shootings did take place in areas where, theoretically, there were design features that did not promote natural surveillance opportunities (e.g., windows with obstructed views, entrapment and hiding spots, mixed land uses to encourage eyes on the street, artificial/intentional surveillance). Thus, this finding corroborates the extant literature, which would suggest that shootings are more apt to occur at sites with design features that limit natural surveillance opportunities.

#### **4.5 Image**

Studies have reported that the image of a particular neighbourhood or building is an important factor that offenders consider before committing a crime. Studies also suggest that crimes tend to be concentrated in areas that appear to be abandoned, isolated or dilapidated (Wilson and Kelling, 1982; Skogan, 1990). The presence of litter, trash, abandoned buildings and broken windows make a place more susceptible for criminal victimization (Wilson and Kelling, 1982). An area that appears to be abandoned, isolated

or dilapidated is more susceptible to crime than an area that is perceived as well cared for and well managed by residents (Erooga, 2012). According to Newman (1972), a positive appearance conveys that owners have a vested interest and are more likely to challenge intruders or report them, while disorder communicates lack of community investment in an area and that undesirable behavior will likely go unchallenged. For Newman (1973) “individuals draw conclusion about residents’ lifestyles based on their perception of the physical environment image and milieu” (as cited in Erooga, 2012, p. 144). Thus, offenders will decide whether or not to invade a given space based on the visual cues emitted from that area (Reynald, 2011). De Frances and Titus (1993) note that burglary is higher in areas with abandoned building, graffiti, broken windows, and other signs of disorder. This is consistent with previous research from Skogan, (1990) and Perkins and Taylor, (1996). In short, image may play a role as a symbolic deterrent or attractor to likely offender (Reynald, 2011).

Symbolic signs of physical deterioration (e.g., abandoned or unkempt housing); “incivilities” (e.g., litter and graffiti,) and real dark and empty streets also seems to be associated with gun violence. In their report on the influence of vacant properties on gun shootings, Caplan et al. (2012) argue that gun shootings are significantly more likely to occur at places in close proximity to vacant and abandoned properties. They concluded that places farther from vacant properties have lower risk of gun-related homicide. This may be due to the fact that studies have indicated that “abandoned buildings provide cover, concealment, and opportunities for motivated criminals” (Shane, 2012, p. 8) Shane adds that serious violent crimes such as murder, robbery, and sexual assault sometimes occur in or around abandoned buildings and lots since “no one is present to guard it or to regulate behavior, crime and disorderly conduct may escalate, which gradually erodes the sense of caring and ownership for the property and increases the risk of victimization and offending” (p. 8). Spelman (1993) state that crimes are likely to

be higher in area with abandoned buildings that shows clear signs of both physical and social disorder.

Finally, research suggests that unkempt, poorly maintained residences may be more vulnerable to property crimes because they are more likely to communicate to potential offenders that residents are not likely to respond to disorderly or criminal activity. In contrast, according to Newman (1972), homes that are well maintained convey that owners have a vested interest in their property and are more likely to challenge intruders or report them. Newman (1972) also notes that homes that have many territorial displays (decorations, personalization, good maintenance, etc.) will experience less crime since “intruders feel conspicuous and vulnerable entering a property with many of these territorial displays” (Macdonald and Gifford, 1989, p. 193). This “suggests that crime can be prevented by increasing residential beauty rather than fortifying dwellings” (Macdonald and Gifford, 1998, p. 204).

Table 4.8 summarizes the descriptive statistics from the survey in regards to the image and maintenance of sites where shootings took place in the HRM.

**Table 4.8: Prevalence of Physical Deterioration and Disorder**

<b>Variables ( N=36)</b>	<b>Coding</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Garbage, litter or broken glass on the street or on the sidewalks	<b>Yes</b>	12	33
	<b>No</b>	24	67
Needles, syringes, or drug-related paraphernalia on sidewalk, in gutter, or on the street	<b>Yes</b>	0	
	<b>No</b>	36	100
Graffiti on the building, signs on walls, or signs of vandalism	<b>Yes</b>	11	30.6
	<b>No</b>	25	69.4
Any buildings with broken windows	<b>Yes</b>	0	0
	<b>No</b>	36	100
Many abandoned building in the area	<b>Yes</b>	0	0
	<b>No</b>	36	100
Premises and landscaping are clean, neat and well maintained	<b>Yes</b>	16	44.4
	<b>No</b>	20	55.6

Table 4.8 indicates that only 12 sites had litter on their block, however the researcher noticed that (with the exception of Demetrious Lane and Creighton St) none of the sites had problems with litter. In addition, graffiti and signs of vandalism were present on less than 31 percent of the blocks. None of the sites were located near to vacant and abandoned properties. In the vast majority of sites in the HRM where shootings took place, there were no abandoned or dilapidated buildings nearby nor were broken windows visible. Nor were there any signs of needles, syringes, or drug-related paraphernalia on the streets (including sidewalks and gutters) where the shootings took place. In contrast, the research findings indicates that the majority of the sites where shootings took place (55.6%) were not clean, neat or well maintained. This finding does reflect the extant literature.

In conclusion, there were mixed results as far as image and the upkeep of properties and their surrounding environment are concerned. The majority of shootings occurred in neighborhoods that were not characterized by signs of physical disorder (presence of garbage, broken windows, abandoned property etc.). This finding contradicts the extant literature that draws a causal relationship between a dilapidated physical environment, on the one hand, and crime and violence on the other. In contrast, this research did find that most of the addresses where shootings took place were not clean, neat or well maintained. With that said, the poorly kept dwellings were mostly in public housing complexes and neighborhood with high-rise apartment buildings. Thus, the prevalence of shootings at sites with poorly maintained housing may be more a function of the social environment of public and multi-residential housing as opposed to image and upkeep.

## **Chapter 5**

### **Conclusion**

Youth–and gang- related gun violence in Canada, and the Halifax Regional Municipality (HRM) in particular, is a crime that has received little attention in the social scientific community. From both a theoretical and empirical standpoint, not much is known about the characteristics of the built and physical environment in which most public gun-related crime occur, let alone how certain environmental settings and characteristics may influence the opportunity for gun violence to occur. This study broadens the scope of this literature base by exploring the predominant physical characteristics of sites where youth shootings took place in the HRM to determine what environmental features of the built and physical environment contribute to youth and gang-related gun violence.

Several major findings emerged from this research that corroborates the theories and findings of other scholars. In general, these findings lend some support to situational theories of crime and crime prevention that certain characteristics of the built and physical environment are common when examining opportunistic criminal acts, and gun violence in particular. In other words, this study appears to provide some limited support for place-based opportunity theories of crime, which argue that the design characteristics may influence the opportunity for a criminal act to occur in a certain place. However, as detailed below, the nature of this study’s design militates against establishing a causal relationship between the design features of a site, on the one hand, and crime occurrence or the decision-making process of an offender. Notwithstanding these limitations, the main findings of this study – including the extent to which they corroborate or contradict the extant literature – are as follows.

First, this study provide some limited support for theories and existing studies that the choice of a potential target by an offender may be influenced by a number of locational factors. This study found that that youth shootings tend to be higher on streets

that are in close proximity to an intersection, public transportation stops, and “crime generators,” such as public housing, fast-food restaurants, malls and parks.

Second, the findings of this research indicate that there was a greater frequency of shootings on through streets (compared to cul-de-sacs or dead ends), as well as streets that had minimal access control or traffic calming measures. However, due to the limitation of the data and the lack of rate calculation, this study has no way of knowing what the rate of shootings is on cul-de sac, one-way, or intersection design.

Third, the findings of this study provide support for the argument that limited surveillance opportunities by legitimate users of a space may create opportunities for criminal acts. Many of the sites did not have safe design features that promote natural surveillance (e.g., windows with obstructed views, entrapment and hiding spots, mixed land uses to encourage eyes on the street, artificial/intentional surveillance). In addition, this study found that many of the sites where shootings took place did not have design features that promote pedestrian traffic (i.e., eyes on the street) nor did they have much in the way of intentional/artificial surveillance, such as CCTV cameras or security personnel. In other words, the majority of shootings occurred at sites where there was less than optimal (natural) surveillance opportunities. Thus, this finding corroborates the extant literature, which would suggest that shootings are more apt to occur at sites with design features that limit natural surveillance opportunities.

Finally, this study produced mixed results as far as image and upkeep of properties and their surrounding environment are concerned. The majority of shootings occurred in neighborhoods that were not characterized by signs of physical disorder (presence of garbage, broken windows, abandoned property etc.). This finding contradicts the extant literature that draws a causal relationship between a dilapidated physical environment, on the one hand, and crime and violence on the other. In contrast,

this research did find that most of the addresses where shootings took place were not clean, neat or well maintained.

In summary, two dominant findings of this study suggest that youth involved in gun violence will tend choose locations that provide quick access and egress and where there is minimal chance of detection (i.e., the absence of surveillance opportunities for legitimate users of a particular space). These findings very much support the theories and empirical research on the design features of the physical and built environment and the decision-making process of offenders.

The findings of this study are significant because, not only do they help identify characteristics of the physical environment that predominate at sites where youth gun violence has taken place. But they can also contribute to a better understanding of what safe design principles should be implemented that may contribute to help reduce the opportunity for youth gun violence to take place. Based on the results of this study, the following design principles would appear to be effective in reducing the opportunity for gun violence to occur in a particular time and place:

- Street closures and traffic barriers in neighbourhoods that are particularly vulnerable to gun violence (including locations close to crime generators) (Lasley, 1998; Dedel, 2007; Clarke, 2004)
- Controlling the speed of traffics through the use of traffic calming measures such as speed bumps or by “changing the perceived width of the road by narrowing it with walls, hedges and planting and foreshortening the views” (Colquhoun, 2004, p. 211).
- The elimination of entrapment areas and hiding spots around residences and pedestrian travel routes
- Maximizing surveillance opportunities by ensuring that residents have clear, unobstructed views of public spaces from inside their residence, encouraging eyes



- on the street through certain design features (e.g., mixed land use), and the use of intentional surveillance (such as security guards or CCTV systems)
- Ensuring private and public property are clean, attractive and well-maintained (e.g., emphasize signs that residents care and thus are protective and vigilant)

These recommendations, as well as the findings of this study, should be considered within the context of the limitations of this study. The sample size was small and the nature of the research design could not establish a causal effect relationship between the physical and built environment, on the one hand, and preponderance of crime, the creation or suppression of criminal opportunities, or the behavior of offenders and legitimate users of public and private space, on the other hand. Indeed, the findings of the study illuminate the complexity of the relationship between design features of the physical and built environment, on the one hand, and the behavior of users (both offenders and legitimate) of a particular space.

Moreover, this study focused exclusively on the physical environment and did not take into consideration other important determinants of gun-related violence, such as the social environment. The scholarly literature recognizes that the social environment is crucial in understanding crime and violence at places. As Merry (1981) writes, environmental design may only have the potential for invoking informal social control or releasing defensive behavior under certain social conditions. Watkins (1998, p.186) adds, “social interactions that occur across places are important feature that must be examined if we are to understand how place features and social factors influence behavior.” Additionally, concern about the social dynamics has led to the development of Second-Generation CPTED by Greg Saville and Gerry Cleveland, in 1997. Second-Generation CPTED assesses “the social dynamics of unsafe neighborhoods and then targeting those factors that might work best to improve conditions” (Saville and Cleveland 2013, p. 93).

Furthermore, CPTED has drawn criticism for its focus on reducing opportunities for crime, and not addressing the root cause of crime. Several critics argue that by altering the physical environment, there is a possibility that crime will be displaced to another location that has not received similar treatment, while others have found that reducing opportunities does not usually displace crime. In the case of gun violence, Second generation CPTED has supported the idea of interventions that tackle both the motive and opportunity for youth shootings as one way to address this issue.

Future research should employ a research design geared towards establish a causal relationship between certain design features of the physical and built environment and (youth) gun violence (including comparing sites where youth shooting took place with sites that had no shooting). It is desirable that future research be designed to test both the social and physical environment that affects youth- and gang- related gun violence. Future studies should also entail research among youth who have committed gun-related crimes to determine their decision-making process in selecting targets and whether certain design features have any influence over their decisions and their actions.

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## **Appendix 1: Physical/Built Environmental Variables Measured**

The standardized questionnaire was constructed using concepts and variables gleaned from the theoretical framework for this study. Specifically, the questionnaire gathered data that measured five environmental attributes that the literature identifies as relevant to promoting or preventing criminal and violent acts: (1) location/surrounding environment, (2) access and egress control, (3) natural surveillance opportunities, and (4) image and milieu. A definition and description of each attribute is provided in chapter two. The following summarizes how each of these attribute is conceptualized and operationalized for this study, and the data collection and analysis specifically.

### **1. Location/ surrounding environment**

The location and surrounding environmental characteristics were operationalized for this study using dichotomous variables that denoted the presence or absence of certain design features on the site and/or the block. Zero (0) represents no (the attribute was not present), whereas 1 represents yes (the attribute was present). As far as a shooting is concerned, the variables assessed as part of this category were: (a) located near an intersection, (b) close to public transportation stops, (c) near a freeway exit, (d) corner lots (e) on a major road with more than 50 cars per hour, and (f) adjacent to establishments/facilities that may serve as a crime generator. This category also attempted to determine if the site where a shooting took place was adjacent to what the literature deems to be a “crime generator,” which included one of the following: (1) a gas station and/ or convenience store, (2) a bus stop or bus terminal, (3) public housing, (4) a fast-food restaurant, (5) a shopping mall, or (6) a park.

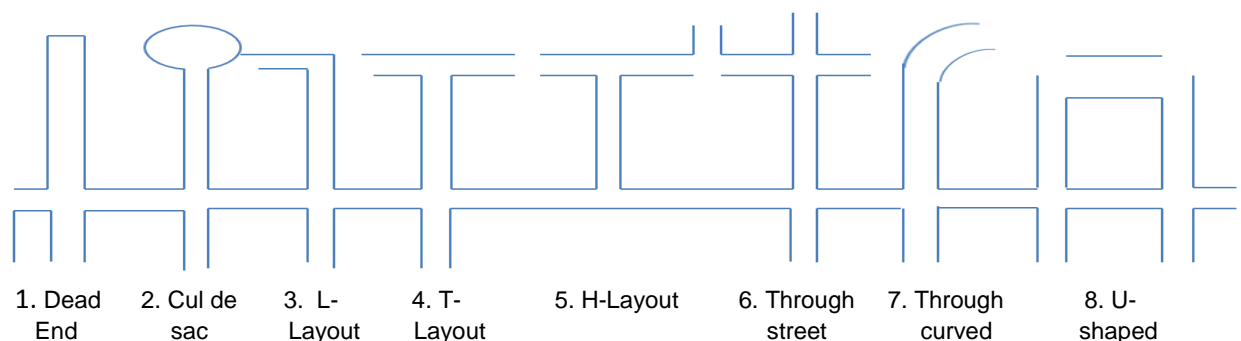
## **2. Natural Access / Egress Control**

The concept of access and egress control was divided into two categories: pedestrian movement and vehicular traffic and street characteristics.

Pedestrian movement and vehicular traffic - This variable was operationalized in the questionnaire through the characteristics: (a) easy (uncontrolled) access to the site by cars, (b) easy (uncontrolled) egress from the site by cars, (c) streets that have designs characteristics to reduce volume or speed (e.g. roundabout), (d) easy (uncontrolled) access to the site by pedestrian, (e) easy (uncontrolled) egress from the site by pedestrians, and (f) any form of access control to the site.

Street pattern – In addition to site visits, Google Earth and Google Street View were used to determine the type of street layout (including the type of intersection) for each site. “Google Earth is a free-Internet –based software tool that enables users to view satellite images of the earth’s surface at varying resolutions, whereas Google Street View is an additional feature of Google Earth that allow user the view of streets” (Aps, 2012, p. 37 ). The following characteristics of streets were assessed:

1) Street layout - This study coded the type of street layout into one of the following categories.



2) Street Intersection - The type of street intersection/pattern where a shooting took place was coded into one of the following categories:

**Coding item for Street intersection/pattern**

<b>Variable</b>	<b>Definition</b>
Three- way intersection	A type of road intersection with three arms , normally refer to as a “T” intersection
Four way intersection	A crossing over of two streets or roads, normally refer to as a cross intersection (+)
Two- way	The traffic flows both ways
One-way	The traffic flows one-way, indicated by street

**3. (Natural) Surveillance Opportunities**

The following tables indicate the coding scheme used for artificial, organized and natural surveillance.

**A. Coding for Natural surveillance**

<b>CPTED Measure</b>	<b>Description/operationalization</b>	<b>Coding Scheme</b>
Presence of people	Does the site appear to have heavy pedestrian traffic (i.e., more than 25 pedestrians per hour)	0 = No 1= Yes
	A mix of uses ensures that space is used throughout the day and the evening	0 = No 1= Yes
Clear Visibility	In general, does the physical design maximize (natural) surveillance opportunities for legitimate users of the space	0 = No 1= Yes
	Windows overlooking sidewalks and streets are clear of obstructions	0 = No 1= Yes
	Windows on all sides of the building provide full visibility of the property	0 = No 1= Yes
	Fencing allows natural surveillance from the street to the building and from the building to the street	0 = No 1 = Yes 98 = NA
	The front door is clearly visible from the street or by neighbors, and driveway.	0 = No 1 = Yes 98 = NA
	The driveway is visible from either the front or back door and at least one window	0 = No 1 = Yes

		98 = NA
	The design of the site ensure clear sightlines and visibility for legitimate users	0 = No 1= Yes
	Parking areas are visible from windows, doors and streets and do not hinder natural surveillance	0 = No 1 = Yes 98 = NA
Lighting and Street Lighting	There is an outside light at the front door or entrance	0 = No 1 = Yes 98 = NA
	There appear to be sufficient lighting on the site	0 = No 1= Yes

### B. Coding for Intentional Surveillance

CPTED Measure	Description/operationalization	Coding Scheme
Mechanical surveillance	Any “artificial” surveillance on or immediately adjacent to the site (CCTV Camera)	0 = No 1= Yes
Organized /formal Surveillance	Any security personnel on the site	0 = No 1= Yes
	Any other personnel (parking lot attendance) on site that could, as part of their duties, undertake surveillance?	0 = No 1= Yes

**C. Entrapment Spots and or potential hiding spots** - This variable was operationalized by the following question: Are there places where someone could be hiding without you knowing it? This variable was coded as either yes or no Zero (0) represents no (the attribute was not present), whereas 1 represents yes (the attribute was present). This category also attempted to identify those entrapment areas or potential hiding spots which included one of the following: (1) bushes or trees, (2) fences, (3) dumpster, (4) vacant, overgrown land, (5) back of the building, (6) maintained green space, and (7) parked lanes.

#### 4. Image

The following table summarizes how image were coded for this study.

##### Coding for Image

CPTED Measure	Description/operationalization	Coding Scheme
Physical incivility/disorder (Broken window thesis)	Garbage, litter or broken glass on the street or on the sidewalks	0 = No 1= Yes
	Needles, syringes, or drug-related paraphernalia on sidewalk, in gutter, or on the street	0 = No 1= Yes
	Graffiti on the building, signs on walls, or signs of vandalism	0 = No 1= Yes
	Any buildings with broken windows	0 = No 1= Yes
	Many abandoned building in the area	0 = No 1= Yes

*Upkeep* - Upkeep is another way for measuring the concept of image and milieu. The variable upkeep refers to the maintenance of a property. In terms of overall appearance and condition (upkeep) buildings where shootings took place were measured on the questionnaire as very poor, poor, satisfactory, good or very good. It is important to note that this variable assessed only the individual space where shooting occurred and not the entire block (e.g., if a shooting took place at the address number 2414 only the building at this address was assessed).

## **Appendix 2: Photographs of sites where shooting took place**

### **Examples of access control measure**

Sunrise Walk and Lavender Walk are two low-income public housing building, located in the north and west of Halifax. They are both high crime areas. As a way of limiting the number of access to the area, they installed open fencing, (i.e., chain link or wrought iron). However, as can be seen in (Figure 1 and Figure 2) this access control measure is not very effective because while it may serve to limit access by cars, it does not serve to limit access by pedestrians.



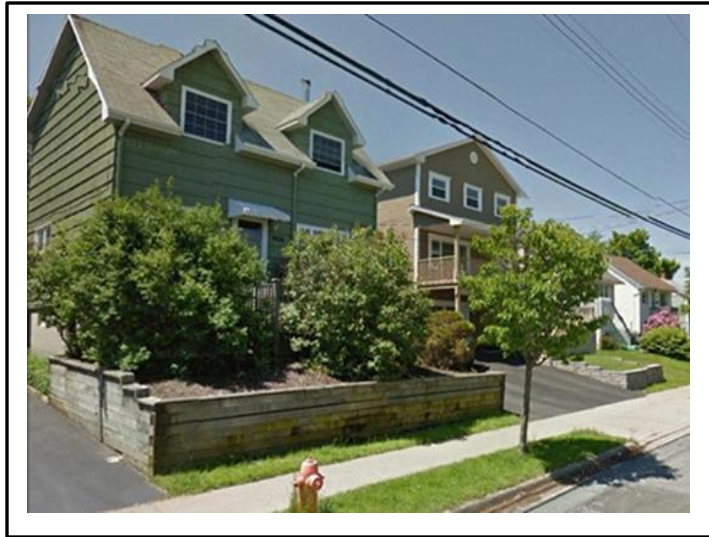
**Photo 1: Sunrise Walk**



**Photo 2: Lavender Walk**

### **Examples of sites that hinder visibility**

This building on St. Paul's St is beautifully landscaped; it has windows in front and on all sides for surveillance. However, its vegetation conceals windows and entrances from the street, thus interfering with visibility and making it susceptible to crime.



**Photo 3: St. Paul's Street Halifax**

This apartment building on Joseph Young Street has many windows overlooking the streets to facilitate surveillance. However, the line of sight is blocked by trees that are too high or over-grown.



**Photo 4: An Apartment on Joseph Young Street**



## EXAMPLES OF NEGATIVE IMAGE

Clifton Street and Buddy Day Drive are examples of gun violence sites where graffiti were located on residential buildings. The graffiti on the building in Figure 8.1 (right) appears to have faded, which might suggest ineffective graffiti removal effort and or graffiti that has remained on the premises for an extended period of time.



**Photo 5 : Graffiti, Clifton St, Halifax**



**Photo 6: Graffiti, Buddy Daye Dr**

Demetrious Lane and Joseph Young St are examples of two sites that had problems with litter.



**Photo 7: Trash, Demetrious Lane**

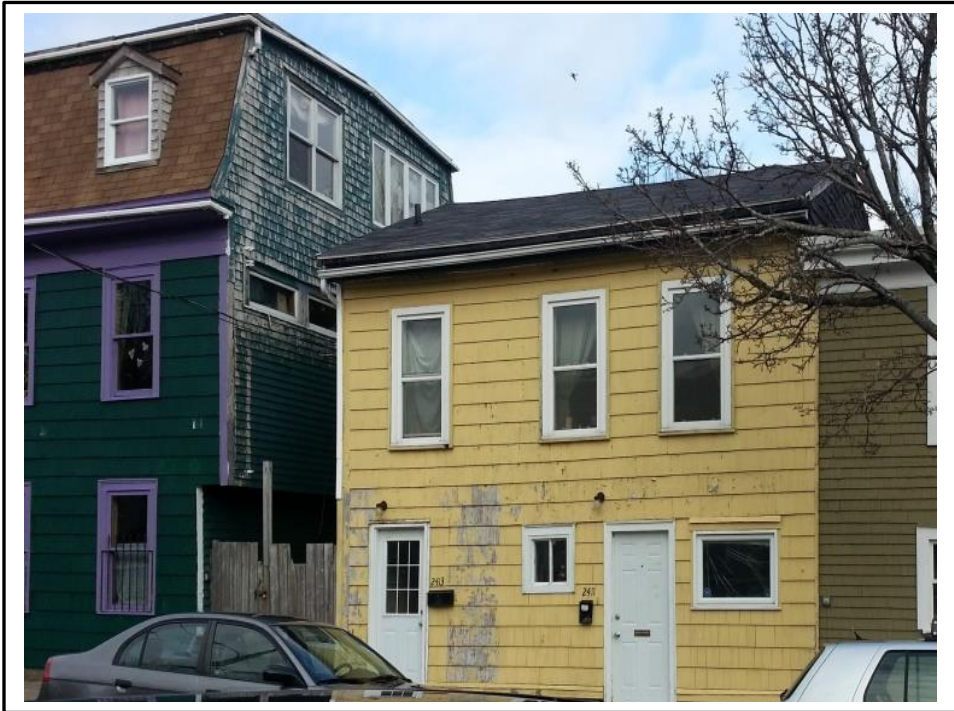


**Photo 8: Trash, Joseph Young Street, Halifax**

Lavender Walk, and Jarvis Lane are public housing complexes, while Creighton Street is a mix of public and private market housing. These three sites are characterized by run-down establishments, peeling paint, cracks in sidewalks and streets, untrimmed and unkempt vegetation, and broken fences, which may be perceived by or communicate to potential offenders that occupants are not likely to respond to criminal activity, thereby making those sites more susceptible to criminal victimization. These sites are also good example or areas with low-level of community ownership.



**Photo 9: Lavender Walk Figure 8.1:**



**Photo 10: Creighton St, Halifax**



**Photo 11: Jarvis Lane, Mulgrave Park, Halifax**