LANDSCAPE INTERVENTIONS FOR PEDESTRIAN SAFETY AROUND URBAN PARKS:

LEARNING FROM CITY OF DALLAS, TEXAS

BY

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THESIS

Submitted in partial fulfillment of the requirements

for the degree of Master of Landscape Architecture at

The University of Texas at Arlington

May 2023

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ACKNOWLEDGEMENT

Dr. Taner R. Ozdil, thank you for guiding me through this journey through the thesis process, for challenging me to attain my full potential, and for being an outstanding teacher. In terms of regular meetings, recommendations, guidance, and criticism, his assistance with my thesis writing is commendable. Throughout the thesis writing process, he was always available. Dr. Austin Allen and Assistant Professor, Letora Anderson have also provided helpful criticism and suggestions on this thesis as committee members, thank you. I also would like to take this opportunity to thank all my friends for always being understanding and supporting me through this journey.

Thank you to all my family members for blessing and praying for me throughout this journey to achieve all my dreams in my life.

ABSTRACT

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The University of Texas at Arlington, 2023

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Urban parks and their immediate surroundings provide access to nature in urbanized areas. However, they can also be crime hotspots if not properly kept or monitored or provide a safe environment for positive activities (Jones & Robinson, 2008). The local community respects a safe and secure neighborhood urban park as proximity to green spaces (McCormack et al., 2010), which enhances living quality (Iqbal & Ceccato, 2015). Nevertheless, a neighborhood urban park and its context have a negative impact on the quality of life if they cater to criminal activity. Crime rates have increased in urban public parks and buffer zones (Groff & McCord, 2011). In today's society, urban public parks and their surrounding safety are becoming a severe issue (Kula, 2015). As a result, authorities are always looking for strategies to help them avoid crime (Telep & Weisburd, 2012). Crime Prevention Through Environmental Design (CPTED) is a widely used global concept for preventing crime in various settings (Cozens, Saville, & Hillier, 2005). However, CPTED's basic concepts establish a procedure for recognizing problems, evaluating the physical environment, and identifying ways to eliminate or limit possibilities for crime (Zahm, 2011).

This thesis aims to understand and redesign the environment that contributes to crime by examining where crime and criminal activities occur in and around urban parks in the city of Dallas. The research focuses specifically on analyzing and redesigning State Thomas Neighborhood due to the documented crime hotspots surrounding Griggs Parks. This study aims to provide an evidence-based approach to analyzing and redesigning urban parks and their surroundings to address safety.

This design master thesis follows quantitative approaches to study and assess crime and design in relation to urban parks and their surroundings (Deming & Swaffield, 2011; & Guinn, 2013). This research followed four steps. First, the crime data is collected from the City of Dallas Open Data 2022 (Dallas Open Data, 2022). Then, Geographic Information System (GIS) is utilized for crime mapping based on the collected data to pinpoint hotspots in and around the urban parks in the city. Second, the study adopted hotspot and network analysis using GIS to select one of the binding sites (State Thomas Neighborhood) to examine the issues and offer design strategies. Thirdly, the CPTED principles and other relevant literature are documented to inform design strategies. Fourth, critical case studies are adopted and analyzed using Marcus and Francis' (1998) *People Place* criteria to understand better how the world has approached similar situations. Lastly, design recommendations are made based on the research finding, site inventory, and analysis. The research illustrated that safety could be an issue even in well-designed parks and neighborhoods such as the State Thomas and Griggs Park if the proper design, maintenance, and upkeep strategies are not followed.

In conclusion, this research shows that evidence-based design strategies can enhance the safety of urban parks and their environments and provide safe and secure neighborhoods for people to utilize, starting from the State Thomas neighborhood. The research also shows that CPTED

principles and global design methodologies can be considered here for designing a safer neighborhood in the City of Dallas. Although this research was not conclusive if urban parks may or may not be the reasons for an area to be unsafe, assessing the geospatial distribution of crime through hotspots analysis may yield the park's relationship to its context to propose an urban park region that is safer for people to enjoy.

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INTRODUCTION

1.1 INTRODUCTION

People seek parks in their neighborhoods because they provide contact with the natural and social environment that allows them to meet with friends, observe others, and be seen, all of which contribute to a sense of comfort and security (NRPA, 2023). A safe park and its surroundings are dynamic environments in which its design, upkeep, and policing collaborate so that the general public sees the park as a secure place, wants to visit the park regularly, and spends their free time in the park participating in valued activities (Hilborn, 2009).

Addressing the park and its surrounding safety is difficult because the issue cannot be solved with a single action or solution (Frace, 2020). It necessitates integrated strategies, community involvement, interactive initiatives, and education (Frace, 2020). Understanding the local community's and the offender's perceptions is essential because it will determine how people use their surroundings (Hilborn, 2009). One factor influencing people's choices to use an urban park is safety. In that case, examining the relationship between safety and people's decisions is critical, such as whether or not to use a (un)safe park (Iqbal, 2015).

Parks range in size from massive national parks to tiny neighborhood parks. They are kept in a natural or almost natural state and reserved for specific recreational uses. In addition to promoting users' mental and physical health, parks and their surroundings allow locals to feel rooted in their neighborhoods. A neighborhood is safe and usable because it caters to users' requirements, fosters a sense of place, and offers a positive experience.

People seek out parks because they allow them to interact with nature, unwind, and spend the time outside they require to improve their quality of life while still providing comfort and security. A community's well-planned and frequently used areas, particularly parks and safe pedestrian access, are significant assets. However, a neighborhood loses its value and benefits when that space becomes a liability, weak point, or unsafe (Dannenberg, Franklin, & Jackson, 2011).

Understanding the elements of the built environment may affect urban crime. Designers and planners face new challenges as new communities and urban parks emerge, particularly in recent decades, due to increased population growth in the Dallas, Texas, region (World Population, 2022). There needs to be more data given about the social effect of these urban parks. More specifically, it needs to be clarified how the design of urban parks and their periphery planning address crime problems and their impact on the future of these urban parks. Parks provide a common area for recreational activities and aesthetic experiences for all. They are said to improve people's physical and mental health, but they may also be a criminogenic environment. The challenge is to focus on the park and its environment, which is fundamentally a public place intended to be accessible to all. Using Crime Prevention Through Environmental Design (CPTED) concepts, you can decrease the opportunities, occurrences, and fear of neighborhood crime, resulting in a safe environment. To understand the social contributors to crime, this thesis examines the hotspots of criminal activities in and around urban parks in Dallas.

Understanding the incorporated components of CPTED as safety measures and supporting the subject is essential to comprehend the relationship. This is especially true when examining the expanding importance between safety, public parks, and crime prevention. The built environment and metropolitan areas, crime rates and perceptions, safety audits, circumstances, and several other

elements all play a role in the overall safety picture. Park safety extends beyond physical space and depends on those who experience it.

1.2 PURPOSE OF STATEMENT

The purpose of this research is to understand and redesign the environment that contributes to crime by examining where crime and criminal activities occur in and around urban parks in the City of Dallas. To make and improve future design and planning decisions, the research focuses specifically on the hotspots (locations where crimes have most frequently occurred) within t State Thomas Neighborhood due to the documented crime hotspots surroundings Griggs Parks. This study aims to provide an evidence-based approach to assessing and redesigning urban parks and their surroundings to address safety and security.

1.3 RESEARCH QUESTIONS

This study's main questions are as follows:

1. What type of crimes do occur and where in and around urban parks in the City of Dallas?
2. What are the environmental variables and features that effects crime in and around parks?
3. What design improvements can be made to improve environmental conditions surrounding the crime hotspots in and around Griggs Parks in the State Thomas neighborhood of Dallas, Texas?

1.4 DEFINITION OF TERMS

Crime: Violating a law or set of norms for which a court may ultimately impose a conviction (National Institute of Justice, 1996).

Crime Cluster: A field where there are disproportionately many criminal incidents (Braga, 2008).

Hotspot: Hotspot is defined as a geographic area with a relatively high level of crime or disorder compared to the surrounding areas (National Institute of Justice Research Brief).

Walkability: The ability to walk in a given area is referred to as walkability (Ozdil et. al, 2012).

Urban Environment: A construction of a space or spaces found in a city, including the actual space and context (Alexander, 1964; Eckbo, 1964; Simonds, 1997).

Crime Prevention Through Environmental Design (CPTED): A strategy for problem-solving that considers the environment and the opportunity it presents for crime or other wrongdoing unwanted and unintended actions. CPTED aims to lessen or get rid of such opportunities by utilizing environmental factors to regulate access, present opportunities for seeing and being seen, define ownership, and promote upkeep of territory (Environmental design crime prevention, 2023).

Geographic Information Systems (GIS): An integrated collection of computer software and data used to examine and manage information about geographic locations, evaluate spatial relationships, and simulate spatial processes. A GIS is a framework for collecting and organizing spatial data and related information so that it may be presented and analyzed (ESRI, 2023).

Geocoding: A GIS process that converts street addresses into spatial data that may be shown on a map as features, typically by referencing address information from a street segment data layer (ESRI, 2023).

Urban Park: A defined, contiguous piece of public open space that is kept in a "natural" or semi-natural (landscaped) state and reserved for a certain use, typically recreational. A border barrier, which may be permeable or semipermeable, is frequently used to enclose parks (a hedge, fence, or wall) (Hilborn, 2009).

Neighborhood Park: Open space created in residential areas; constructed and administered publicly as part of the city's zoned open space or as part of new private residential construction; may include playgrounds and sports facilities (Lee, 2013).

Safety: According to the National Institute of Justice (NIJ), safety from crime can be defined as "the absence of real or perceived threat, harm, or victimization resulting from criminal activity" National Institute of Justice (NIJ, 2010).

Geospatial: A set of technological approaches, such as GIS, photogrammetry, and remote sensing, for acquiring and manipulating geographic data (ESRI, 2023).

Safe Park: A dynamic space where the planning, upkeep, and policing of the park all work together to ensure that the public views the park as a safe space, desires to visit it frequently, and spends their free time there participating in activities they value. The park is used by a variety of groups, and there is little crime or unrest. Most of the park's activities are legal. Because the neighborhood loves the park, it feels like it "owns" it, and there are enough visitors who serve as "natural guardians" to maintain informal social control (Hilborn, 2009).

Risky Park: A location where crime and disorder are so common that park visitors consider it unsafe, strive to avoid going there, and only utilize the park for necessary purposes. Vandalism, littering, dog fouling, drug usage, public prostitution, and other forms of crime and disorder have taken over as the main activities in the park (Hilborn, 2009).

1.5 RESEARCH METHODS

This study uses quantitative approaches to assess criminal data concerning urban parks and their surroundings (Deming & Wavefield, 2011, & Guinn, 2013). The research primarily uses secondary crime data from the City of Dallas Open Data for the year 2022, which then utilizes Geographic

Information Systems (GIS) for crime identification, frequency, and location to pinpoint the actual criminal events in and around the parks.

A virtual-site inspection of crime clusters near the urban park neighborhood follows GIS hotspot analysis. The research methods are then used to narrow down the sites that require additional assistance. Using GIS network analysis with a radius of .25 miles helps determine the park, which requires a safe and secure walkable neighborhood. The neighborhood near the urban park with the highest rate of hotspots is selected for further inventory analysis and design.

For setting up criteria for designing the selected site, a literature review that focuses on CPTED principles and case study analysis is done based on Marcus and Francis (1998).

Finally, design recommendations are provided based on the inventory and analysis of the site. The study showed that safety could be an issue even in well-designed parks and neighborhoods like State Thomas and Griggs Park if correct design, maintenance, and upkeep strategies are not followed.

In conclusion, this study demonstrates that evidence-based design solutions can improve the safety of urban parks and their environs and provide safe and secure areas for people to use, beginning with the State Thomas neighborhood. The research also reveals that CPTED ideas and design approaches utilized worldwide may be used to develop a safer community in Dallas.

Although this study could not determine whether urban parks cause an area's safety, assessing the spatial distribution of crime through hotspot analysis could reveal the park's relationship to its context, with the goal of proposing a safer urban park region for people to enjoy.

This study's data collection and analysis techniques can be summarized in four steps:

1. Secondary data acquisition (Dallas Open Data for 2022 is collected, prepared, and geocoded).
2. Mapping, GIS Hotspot, Network analysis and inventory.
3. Concept development for pedestrian safety measures around urban parks.
4. Designing according to the analysis and findings.

GIS requires various supporting data; this secondary data is acquired from a combination of descriptive statistic resources (NCTCOG, 2022 & Dallas Open Data, 2022). Secondary data is geocoded and analyzed concerning spatial elements such as proximity to green space/parks, land use, population density, etc. The GIS tool's inventory and analysis determine criminal activities using description, location, and coordinates. Following the preliminary inventory and analysis, site observations connected with criminal activity are conducted to (1) determine the type of crime concerning the site and (2) provide photographic data to understand spatial commonalities among crime clusters better.

After the initial research methods steps are completed, GIS tools are used to configure the data needed for the proposed research. The combination of primary and secondary data in this research enables the research to identify types of crime and assess environmental factors that contribute to delinquency in Dallas and this specific neighborhood. Finally, the findings are presented as descriptive data, graphs, charts, and visual illustrations, leading to a final modal design.

1.6 SIGNIFICANCE AND LIMITATIONS

This research aims to provide systematic knowledge and assessment and design strategies for crime concerning design and planning practices surrounding urban parks and neighborhoods. In addition, the research intends to provide landscape architects with the spatial attributes of crime concerning physical space while providing geospatial tools to find criminal hotspots.

This research was delimited to the city of Dallas for deeper understanding and focus in one city jurisdiction. The research also had various limitations on the assessment of criminal incidents concerning the physical environment, including:

1. Crime statistics are only gathered from January to December of 2022. Redevelopment within the City of Dallas may have an impact on crime statistics.
2. The physical environment may not cause criminal conduct.
3. Even though the data has been reviewed and cleaned for maximum quality, the secondary data obtained from the City of Dallas website may contain human or machine errors while formatting the numbers, resulting in unexpected errors.
4. A few datasets were disregarded due to a lack of address information. Geocoding in GIS needs an address or X, Y coordinates.

1.7 STUDY OVERVIEW

1) Introduction
2) Literature Review
3) Research Methods
4) Analysis and findings
5) Design and Planning
6) Conclusion

The first sections, Chapters 1-2, discuss the urban parks and their surroundings in terms of safety, the significance of criminal assessments, and the main research goals. The following part of this research, Chapters 3-4, focuses on identifying, preparing, and analyzing relevant data for the research questions posed in this research. This section also summarizes the research's preliminary results. The fifth chapter focuses on design strategies and solutions based on CPTED ideas and

case study analysis. Finally, Chapter 6 clarifies the significance of the study and examines how it relates to the profession of landscape architecture, as well as possible future research directions.

CHAPTER-2

2. LITERATURE REVIEW

2.1 INTRODUCTION

"*People do not use city open space just because it is there and because city planners or designers wish they would*" (Jacobs, 1961, p. 90).

Green and open spaces are where we should feel satisfied in providing leisure through outdoor recreational activities and comforting values in a natural setting (Thani, 2016). However, a park and its surroundings are also where some crime incidents occur due to particular circumstances. Even though it might have happened on occasion, the users' decreased sense of safety has diminished the value of the location as a destination that should otherwise bring delight and peace of mind to its visitors.

Parks are often seen as urban amenities or benefits from physical features that, by their presence, improve the comfort and quality of a place and may even contribute to its aesthetic appeal (Ceccato, 2014). Indeed, parks may improve a city's quality of life by serving as a social and recreational hub for locals and tourists. However, it is challenging to put a price on the benefits of parks, such as how they enhance people's quality of life and how they improve the environment in cities (Iqbal, 2015).

Parks can also be connected to urban dis-amenities, unwanted aspects of a location that degrade its quality and surroundings (Ceccato,2014). These undesirables include things like crime, traffic, noise, and pollution. The need to reduce crime and public fear of crime in parks and surrounding open areas has grown significantly during the past few decades.

The arrangements and patterns of urban form around local parks are referred to as 'context' in this study (Talen, 2005). The physical structure and layout of urban features such as buildings, lots, blocks, roadways, and crossings are called 'urban forms' (Talen, 2005). We are examining the neighborhood context to study the relationships between parks and pedestrians with crime to understand if it has any mutual connection. Recognizing the typologies of crime and the relationship of crime with the chosen area can be used to introduce CPTED (Crime Prevention Through Environmental Design) concepts (CPTED Guidebook 3-Ed, 2003). A detailed study on how CPTED works is also included. Concluding the literature review is a discussion of Geographic Information System (GIS) as a tool, with its value of the program and the capabilities and limitations associated with GIS.

Further, research worldwide demonstrates that parks and open areas with high crime rates degrade the quality of the immediate environment and lower people's quality of life (Saville & Cleveland, 1998). According to research, crime may be attracted by dense vegetation and insufficient lighting in prominent public spaces with little formal or informal regulation (Groff & McCord, 2011). If choosing a place to live is influenced by factors like safety, it is essential to look at how decisions about things like whether or not to live near a dangerous park are affected by safety (Iqbal, 2015).

It has been stated that the park's location is essential for property value; for example, a park or open space can be more effective at maximizing property prices in the surrounding region and may persuade potential homeowners to live nearby parks (Troy & Grove, 2008). Additionally, it has been stated that crime in parks alters possible buyers' attitudes (Iqbal, 2015).

2.2 SAFETY AND CRIME IN DESIGNING AND PLNNING LITERATURE

Safety is the experienced sense of security and the perceived danger of being victimized (Uittenbogaard, 2014). The greatest crime prevention strategy is to design a city so that people

moving through it provide natural surveillance (Jacobs, 1961/2005). Jacob indicates that four criteria must be met to have a safe city. These four criteria are that the city has a primary function, a mix of functions, is not constructed with too large blocks, has a diverse range of old and new buildings, and has a large population. This theory has a point of view on land use and how people can interact with the environment to avoid crime (Crowe & Zahm, 1994; Jeffery, 1977).

Environmental Security is considered a process of urban planning and design that combines crime prevention with neighborhood design and urban development (Richard,1978). Those in the planning and design professions must serve as a significant interface by coordinating and evaluating planning and design decisions that impact security and, thus, the quality of urban life (Richard,1978). Urban parks have been examined in the research literature as one of the main urban public places in urban design and planning (Lee, 2013). Planning can significantly impact force security now and in the future. Protection methods can be incorporated at the start of the design process with proper planning (Prevatt,1998). Proper planning can prevent costly retrofitting because activity placement and natural design techniques can be used to achieve the same goals that only expensive technical equipment can in some current situations (Prevatt,1998). Good planning and design of public spaces can improve the perception of safety among prospective victims (Talen, 2003).

CPTED is described in urban planning literature as "a useful planning tool for assisting in the creation of more efficient, sustainable, and livable urban design" (Cozens, 2008, p. 272). CPTED includes low-cost and simple design strategies that result in long-term deterrent outcomes (McCormick, 2011). Most crime prevention planning and environmental architecture is based on Newman's defensible space theory (Crowe & Zahm, 1994). Newman's theory of defensible space became a standard of urban design and crime prevention planning in the United States, serving as

a foundation for the CPTED theory (Crowe & Zahm, 1994). Newman proposed constructing public, semi-private, and private spaces to enhance territoriality and surveillance. As a result, criminal behavior would be discouraged by creating defensible spaces (Crowe & Zahm, 1994).

The design layout should be an essential concept emphasized throughout the planning stage. All design aspects should include safety principles to reduce crime and increase user safety (Thani,2016). The physical planning and design of the urban environment, particularly in public spaces, can reduce crime by improving lighting, fence, planting, and surveillance elements. This could influence the recommended good surveillance by the environment's design by assessing perceived safety by users and observing people's behavior regarding offending. Contribute to better design while reducing crime chances. Professionals could incorporate safety design ideas from the start of the design process. This ensures that spaces are monitored for future projects and that the quality of outdoor lifestyle is improved (Thani, 2016).

2.2.1 DEFENSIBLE SPACE

Oscar Newman coined the phrase "defensible space" in 1972. Oscar Newman's studies of public housing projects served as the foundation for the defensible space concept, which was one of the first efforts to create an architectural viewpoint on public housing (Richard,1987). The word defensible space was coined in the public housing context to allow residents to control the area without being affected by the government (Crowe, 2000; Newman,1996). According to Newman's research, it becomes unsafe when residents cannot identify with a location, and the area is quickly covered with graffiti and litter (Newman, 1972). The concept of defensible space implies that when individuals feel connected to a particular location, they are prepared to help maintain and monitor it to keep it free of criminal activity (Marklund & Ahrberg, 2017).

Newman (1996) identified three risk factors: the degree of anonymity (the more significant the anonymity, the less social control), difficult-to-monitor areas, and alternative methods for a perpetrator to flee. Newman's theory quickly became a standard of municipal design and planning for crime prevention in the United States, serving as a foundation for the CPTED theory (Crowe & Zahm, 1994; Newman, 1972). In the design of a defensible space, five traditional CPTED concepts are used. Territoriality, surveillance, entry control, task placement, and maintenance are among them.

This research builds on the Defensible Space Framework (Newman, 1972) to contribute to the literature on the park and its surrounding (pedestrian) safety. This approach brought new hypotheses comparing successful metropolitan regions' characteristics versus undesired locations. These theories lay the groundwork for how city planners in the twenty-first-century approach and answer today's concerns about successful, thriving city centers and crime prevention.

2.2.2 TERRITORIALITY CONCEPT

"Animal non agit, agitur [Animal does not act]," is how 'Bernard Altum' a German zoologist, the father of economic ornithology, writes in his book "*Der Vogel und sein Leben" 1868.* He had portrayed an anthropomorphic and emotional picture of the bird's life (Proceedings of the Linnaean Society of New York, 1933-1941). Altum described how birds build territories to illustrate the concept of territoriality. Later, this territoriality concept got further studied, as discussed in the book "*Territory in Birds Life"* (1920) by 'Henry Eliot Howard,' an English ornithologist. "Territoriality is defined as a pattern of behavior in which an animal or a group of animals defends an area or resource against others of the same species" (Oxford University Press, 2022). Both ornithologists attempted to show how birds act territorially to their lives as a defense tool. This concept has since been applied by many experts in various fields and used as a guide for

understanding the relationships between different species concerning space, environment, and behavior.

The territoriality notion is significant in this study since human history illustrates how difficult it was to survive among other natural life forms. The physical features of most historical forts and castles, such as border walls, observation towers, and moats, evolved to protect each territory from intruders (Piombini, 1987). It is evident that the ultimate aim is safety, which is why animals and humans developed the concept of territoriality as a safety measure. The approach to achieving safety has changed, but the security objective remains (Piombini, 1987). At present, safety precautions have a wide range in terms of traditional techniques like natural surveillance and technology. When one can acquire ownership through activity placement and various other techniques, technology can come into use (i.e., CCTV, fencing). One of the most fundamental territoriality concepts is that the fewer people who dominate an area, the more likely they are to create a sense of ownership (Newman, 1972).

People with a sense of territoriality might employ various demarcation measures – fences, dogs, signs, alarms, and so on – to use, manage, and build a sense of safety for their public and private territoriality (Parnaby, 2004). According to Newman's defensible space concept, achieving territoriality will eliminate or diminish apparent vulnerability to crime, hence aiding in the deterrence of potential criminal behavior (Gardiner, 1978).

Newman clarified the relationship between territoriality and crime prevention: "If territoriality is there, an intruder who does not understand the rule system or hesitates to make his intentions apparent is easily identified as not belonging. As a result, he arouses suspicion, which leads to his operations being circumvented." Territoriality, thus, is about applying environmental design to

symbolically establish the grounds for either social inclusion or exclusion by structuring social space in a way that labels specific people as "desirable" or "undesirable" (Sibley,1995, p. 126)

2.2.3 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

Over the last thirty years, Crime Prevention Through Environmental Design (CPTED) has been a part of crime prevention strategies. It is often used in development and planning to deter crime and prevent criminal opportunity (Schneider,2005). The development of CPTED can be traced to the critical analysis of researchers like Jane Jacobs in *The Death and Life of American Cities, 1961*; Schlomo Angel, *Discouraging Crime through City Planning, 1968*; and Oscar Newman's *Defensible Space, 1972*. The CPTED framework was further developed by C. Ray Jeffrey, *CPTED, 1977*, which assumes that the right design and effective use of the built environment can lead to a decrease in crime fear and incidence and an improvement in overall quality of life (Crowe, 2000).

Braga (2008) states that CPTED represents environmental factors and opportunities for crime or other unplanned and undesirable behaviors. The concept of CPTED has been widely used in housing complexes, universities, and streets but not in urban parks and their surroundings. Hence this thesis project will focus on using CPTED in urban parks and their surroundings to enhance the park's layout and encourage people to use it actively, thereby increasing safety.

CPTED focuses on reducing opportunities for crime, primarily in public environments (Jusiewicz, 2012, p.9) According to the National Crime Prevention Council, CPTED deals with "the design and use of the environment which directly affects human behavior, and which influences both fears of crime and opportunities for crime and ultimately affects the quality of life" (1997).

Each concept works to demonstrate how implementing it might assist organizations by focusing on behavior and space analyses rather than catching and apprehending criminals. It adds

perspective to the assessment and seeks to prevent crime before it occurs (Cannavino, 2016). There are several significant overlaps; however, each identifies alone for simplicity and clarity. When applied in practice, these concepts should be viewed as phases in a single approach to physical environment security. However, it should be highlighted that CPTED should not be used as the primary source of crime prevention and should not be used in place of more traditional policing tactics; however, it can still contribute to the success of any organization (Frace, 2020).

By considering CPTED in this research, the aim is to relate it to health, safety, and awareness design aspects. For a better understanding, CPTED can be related to historical elements (as previously mentioned in the 'territoriality concept) such as boundary walls, observation towers, and moats. According to The Choice Neighborhoods Conference in Washington, DC, in March 2016, significant benefits of CPTED include reduced crime, reduced potential for crime, perceived more excellent safety and security, and improved quality of life. The outcome expected in this study by applying CPTED in and around urban parks includes designing to create (1) more eyes on the street (natural surveillance), (2) programming spaces with legitimate users, and (3) creating opportunities for people to know each other.

According to the theories of Oscar Newman, Jane Jacob, Schlomo Angel, and Elizabeth Wood, the success of CPTED is more traditional, which focusses on the theories and principles investigated by different experts in the field of architecture and planning. Both CPTED and defensible space evolved as problem-solving factors for spaces that face safety issues (Atlas, 2013). CPTED components will be examined closely in this project, including:

- Layout Design
- Access and Pedestrian Walkways
- Soft landscaping and urban design elements

- Car parks
- Lighting
- Security devices
- Management and Maintenance

2.3 URBAN LANDSCAPE AND SAFETY

Many design concerns cause cities to become abandoned or unhappy. It disrupts user engagement and contributes to the creation of opportunistic criminal venues. Visibility, border, and enclosure increase theoretical parameters, and altering factors influence feelings of safety and terror (Frace, 2020).

This thesis examines the urban landscape, particularly the urban park, and its safety closely to comprehend the relationship between the two. Urban parks are often located within the urban area (i.e., city center and older residential districts) for people's daily activities such as walking, running, sitting outside, picnicking, and playing casual games (Lee, 2013). They are maintained in a natural or semi-natural state and set aside for specific uses like the above recreational activities (Frace, 2020). Parks can provide an oasis within cities, allowing individuals of all socioeconomic levels to connect with nature, socialize, breathe fresh air, and participate in physical activity (Dannenberg, Franklin, & Jackson, 2011). It allows the users to feel rooted in their communities while providing visitors with mental and physical health benefits.

An urban landscape that is safe and usable serves users' needs, links people with places, gives a positive experience, and remains diverse and exciting (Frace, 2020). People seek parks out because they allow them to mingle, relax, and take the time they need outside to improve their quality of life while providing outdoor comfort and security. A community's well-designed and well-used areas, particularly parks, are valuable assets. However, the park and its surroundings lose their

value and utility when that place becomes a liability, susceptible, or eventually unsafe (Dannenberg, Franklin, & Jackson, 2011). Pincetl & Gearin, (2005) stress the need to keep urban parks occupied with unstructured public activities. Unscheduled and unstructured public activities should be encouraged in urban parks to make them accessible to many individuals (Lee, 2013). Maintenance issues, usage, user conflicts, and nighttime safety are common. They do, however, become a city's central image and meeting spot and a vital focal point for communities.

Phillips (2000) investigated the effects of public parks on real estate property values and found that property values tend to be higher near parks (Lee, 2003). Several researchers have investigated the importance of parks and their impact on people's physical and mental health. Cutts et al. (2009) examined the link between park accessibility and obesity in a recent study and found a positive relationship between park features and nearby residents' self-reported everyday health.

One strategy to address the issue of crime reduction in urban landscapes is to encourage people to use public spaces. Increased natural observation and contact between varied groups of individuals within a community can help reduce crime (McKay, 1998). This research looks closely at accessibility to urban parks since, while the park itself is safe, the surrounding pedestrians must also be safe for people to use.

2.4 CRIME IN DALLAS

When compared to most other cities in the country, Dallas has historically had higher than average rates for both property and violent crimes, particularly aggravated assaults, which have seen a significant increase in recent years despite overall declines in other areas such as robberies or burglaries being reported throughout Dallas (Dallas, TX crime rates, 2022).

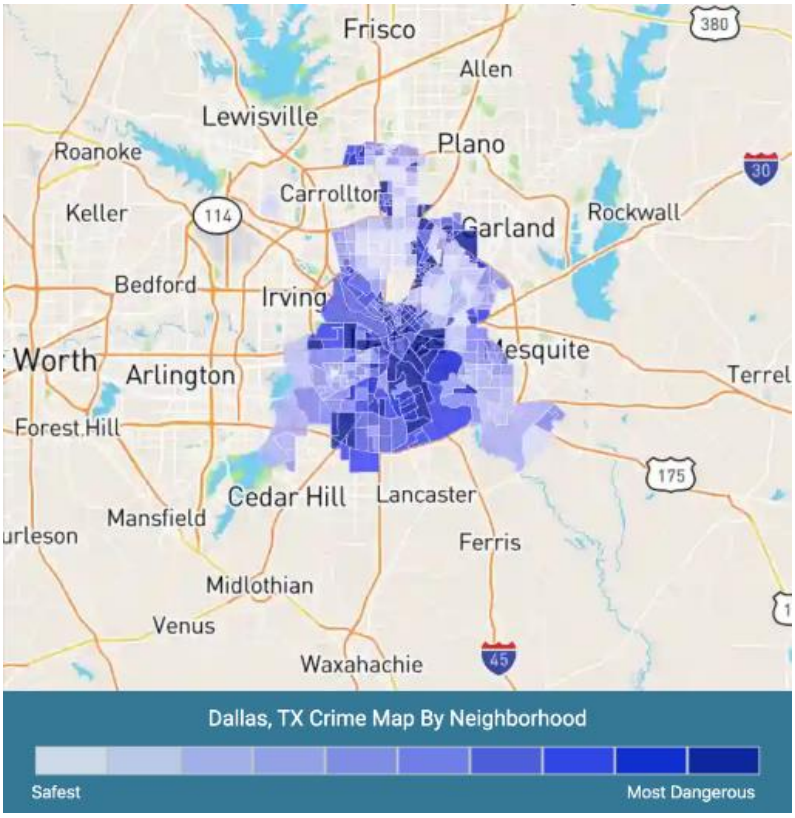


Figure 2. 1 Crime map of City of Dallas. (Credit: Texas Crime Rate, 2022)

Figure 2.1 shows a GIS map of neighborhoods with the highest crime hotspots within the City of Dallas based on 2022 data. Crime rates are more significant in darker blue locations, while hotspots are the darkest shade of blue. According to (By the Numbers: A Look at Dallas' Violent Crime Statistics from 2019 through 2022, 2023), Dallas Police Chief Eddie Garcia stated that violent crime in 2022 would be down by nearly 5.5%. While crime decreased overall in 2022, there was a period between March and May when the city experienced higher crime than in previous years.

May 2022 saw not only more violent crime victims reported than any other May in the previous four years, but also more violent crime victims reported than any other month in the previous four years.

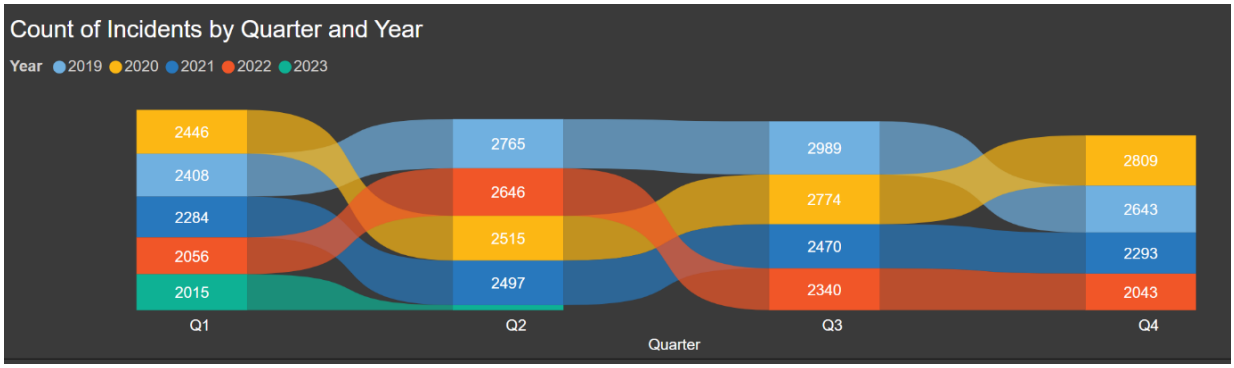


Figure 2. 2 Crime rate for each month/year for the City of Dallas. (Credit: DPD, 2023)

Q1-January, February, and March

Q2-April, May, and June

Q3-July, August, September

Q4-October, November, December

Figure 2. 3 Assault charges in the City of Dallas from 2019 – 2022. (Credit: By the Numbers: A Look at Dallas' Violent Crime Statistics from 2019 through 2022, 2023)

With a few exceptions, Dallas Police Department crime records show the city had a steady reduction in violent crimes in 2022 after peaks in 2020 and 2021 (Dallas Open Data, 2022).

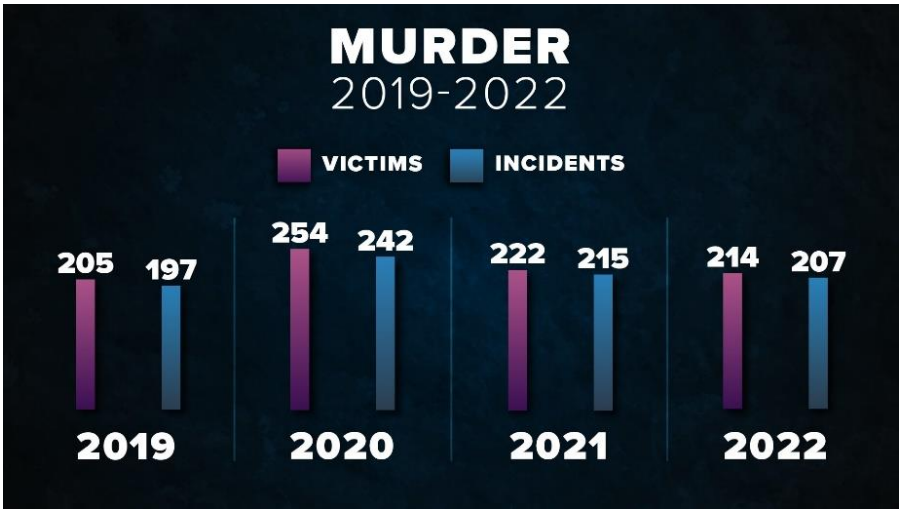


Figure 2. 4 Assault charges in the City of Dallas from 2019 – 2022. (Credit: By the Numbers: A Look at Dallas' Violent Crime Statistics from 2019 through 2022, 2023)

According to the FBI's report (Federal Bureau of Investigation, 2022), Dallas had the country's 31st-highest violent crime rate. Furthermore, according to a report from the Texas Department of Insurance (TDI, 2021), around $2.1 billion was estimated as the cost for insurance-related crime in 2021 in Texas. Hence it is essential to take a closer look at what is happening in the City of Dallas, and this research will concentrate on safety in and around urban parks.

2.4.1 DATA ON CRIME IN DALLAS

According to Dallas Police Department statistics, there was a decrease in violent crime events and victims in the year 2022 (By the Numbers: A Look at Dallas' Violent Crime Statistics from 2019 through 2022, 2023). However, there are certain exceptions. More problems develop in places such as airports, parks, and schools. People who live in the Dallas metro region live near recreational places. Because of the massive volume of visitors, crime rates may appear more significant even in safe parks. Ultimately, crime occurs wherever people congregate, whether they

live there or not. Before dismissing a region as unsafe, examining the crime rate and overall crime maps and then evaluating surrounding locations that people may visit is necessary (Cops Office, 2019). Figure 2.5 shows an example of a geocoded map.

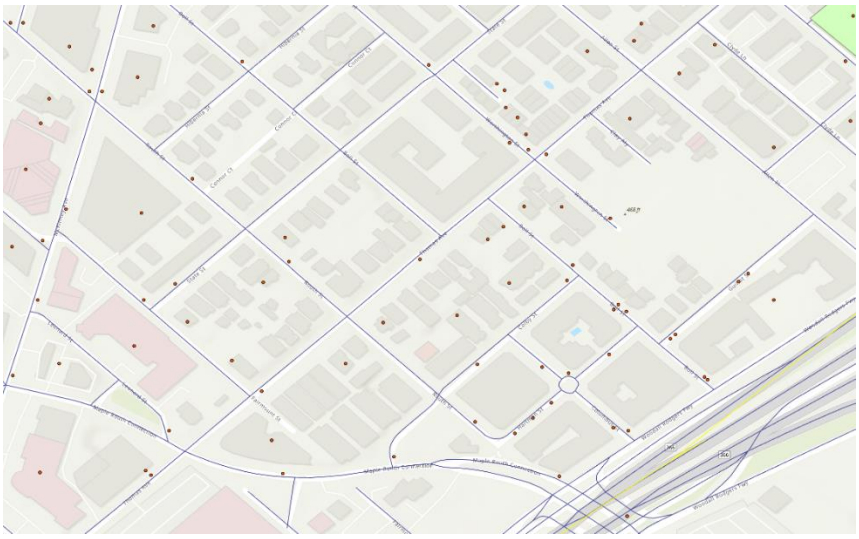


Figure 2. 5 Example of geocoded data

For the year 2022, there were 135,517 crime point data accessible on the Dallas Open Data website. This information included specifics such as the type of incident, time, address, victim race, and x,y coordinates. These coordinates were then translated into point data, and the graphic below represents an example of point data achieved through GIS.

2.4.2 LAND USE AND CRIME

In metropolitan settings, research has shown that the type of land use can influence criminal behavior (Loukaitou-Sideris et al., 2000). The relationship between land use and crime must be understood from an analysis and inventory standpoint. Land use influences the types and timing of activities in a specific area (Monteiro et al., 2023). For example, researchers from the survey of public housing developments in Chicago (Larson, 2022) discovered that 52 percent fewer crimes were reported near buildings surrounded by trees and trees are more likely to be located near residences of wealthy individuals, and less likely to be found near public housing where occupants

are more likely to be impoverished. The trees themselves are only another evidence of the residents' prosperity. Compared to roadway segments with unoccupied, abandoned, and untreated properties, better-managed vacant lots have fewer assaults, gun assaults, vandalism, and violent crimes (Branas et al., 2011; Heinze et al., 2018).

In the early 1980s, land use was the key environmental factor criminologists linked to crime rates (Dunn, 1980). In addition, land use patterns that encourage more street activity might boost passive surveillance and create opportunities for repeated accidental meetings, both of which promote the formation of informal regulatory mechanisms (Leyden 2003; Lund 2003). Thus, depending on whether individuals are prospective guardians or potential criminals, land use arrangements that stimulate street activity may be predicted to increase or diminish opportunities for crime (Zahnow, 2018).

Mixed-use urban development’s incorporate several purposes and, as a result, attract a diverse range of user groups throughout the day. Mixed-use developments integrate "live, work, play" by combining several purposes, such as residential, commercial, retail, medical, educational, or even industrial land use in a compact neighborhood (Zahnow,2018). Colocation of land uses promotes more localized activity patterns and eliminates the need for long commutes. As a result, mixed land use has become an essential component of modern urban planning (Hirt 2016). Proponents of new urbanism argue that mixed land use creates safer, more vibrant neighborhoods with activity at all hours of the day; stimulates the local economy; promotes social equality by assisting people in becoming accustomed to social differences; and improves health and well-being by encouraging pedestrian activity (Campbell 1996).

Indeed, studies have shown that rather than increasing safety, mixed-use might also increase crime opportunities (Zahnow, 2018). As a result, the relationship between crime rates and land use must be examined closely to determine what is happening in a particular location.

2.4.3 DALLAS URBAN PARKS

Urban parks are valuable assets to the community. They provide a convenient environment for various leisure and recreational activities while improving the community's image and perceived value (Hayward, J. 1989). In addition, urban parks may meet the requirements and interests of many types of people and various sections of the population: young and elderly, groups and individuals, wealthy and impoverished, male and female, athletic or not, and people of all ethnic and cultural backgrounds. Because of this broad appeal, city parks are a significant asset to the quality of urban life, both socially, behaviorally, and physically (Hayward, J. 1989).

According to Dallas Parks and Recreation, Dallas Park System is one of the nation's largest city park systems, with 397 parks comprising over 20,118 acres of developed and undeveloped parkland, including:

- 18,994 parkland acres
- 1,124 surface acres of water
- Seven lakes and 33 ponds
- 158 miles of developed trails
- Four dog parks
- Athletic fields, playgrounds, spray grounds, tennis, basketball, and volleyball courts, picnic shelters.

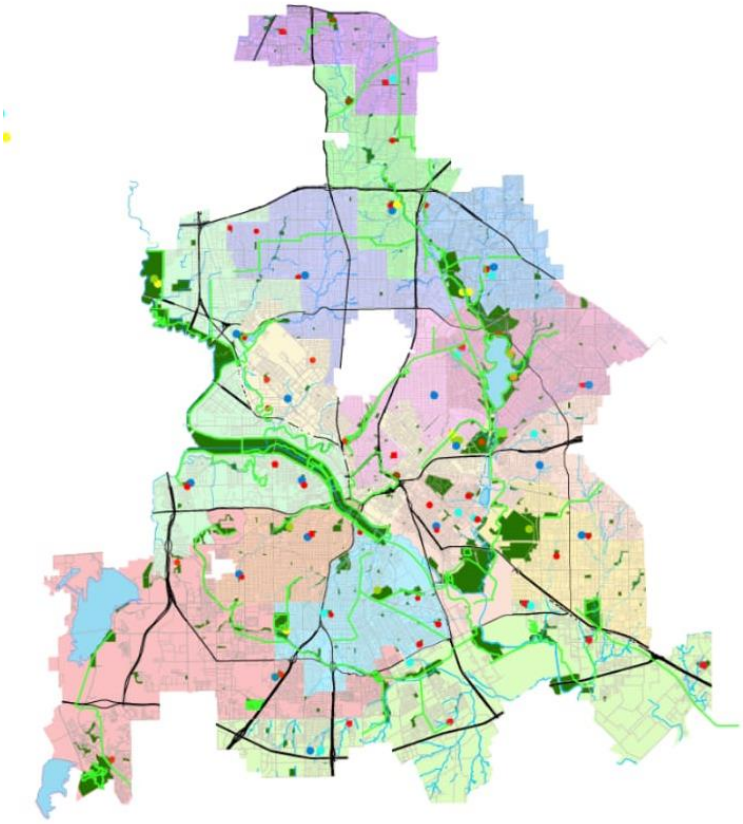


Figure 2. 6 Parks in the City of Dallas. Credit: Dallas Parks & Recreation

According to the National Recreation and Park Association (NRPA) criteria, Dallas Parks are divided into eight Park Classifications. Each group addresses a distinct need in the community.

- Mini Park
- Neighborhood Park
- Community Park
- Metropolitan Park
- Regional Park

- Special Use Area
- Linear Park
- Conservancy

Dallas Park and Recreation collaborate closely with the Dallas Police Department to guarantee the safety of the city's park system for all citizens. The City of Dallas has rules that ensure safety, including Alcoholic beverages prohibited in the park, public streets, sidewalks, and parking adjacent to the park. Park is closed from 11:00 p.m. to 5:00 a.m.; Littering is prohibited, and No dumping is permitted. Downtown Dallas, Inc. (DDI) Security Officers routinely patrol all Downtown parks to ensure park rules are followed and park users' safety. The proactive security patrols involve hourly safety inspections and occur seven days a week between 6:30 a.m. and 11:00 p.m. (Parks for Downtown Dallas, 2022).

As a result, it is critical to comprehend the implications of safety measures in terms of design in and around Dallas' urban parks. Therefore, this thesis proposes design safety measure principles for the City of Dallas' park environments.

2.5 SUMMARY

Chapter Two explains the literature on safety and design in the built environment. The CPTED principles, as well as the considerations of defensible space and territoriality, demonstrate how these principles can typically be associated with the design of urban landscapes. A keen investigation and adaptation of similar typology to the site are crucial, particularly for the City of Dallas.

According to Dallas crime statistics, no continuous drop in offenses has occurred. Although law enforcement is acting and establishing legislation and enforcement for control, as a designer, it is

critical to examine the problem of bringing safety surrounding parks for future growth. By combining law enforcement and design perspectives on safety for the City of Dallas, it is conceivable to make Dallas the safest city in the country. The literature illustrates that proper design interventions can improve safety and security in and around parks in the future.

CHAPTER-3

RESEARCH METHODS

3.1 INTRODUCTION

The research in this master's design thesis is based on extensive data collecting and analysis methodologies, procedures, and methods, resulting in a partnership similar to landscape architecture. These methodologies examine data to discover conclusions before synthesizing and compiling appropriate criteria for repurposing crime data in the City of Dallas, Texas.

3.2 STUDY LOCATION

It is critical to study crime in urban parks and their neighborhoods in the City of Dallas, Texas, to identify significant design elements associated with safety in the built environment. After a series of hotspot analysis Griggs Park and State Thomas neighborhood is chosen for detailed design intervention. Locational attributes of this study include overlaying the crime data map on top of land use, circulation, population density, and green and open space evaluated for this research, on which the site is chosen. Urban parks near hotspots are considered to finalize the site for design.

3.3 SITE SELECTION PROCESS

Site selection was one of the first critical aspects of this investigation. With the help of optimized hotspot analysis, a square polygon fishnet with dimensions of 1500' by 1500' is obtained to examine the hotspots closely. Next, urban parks within or near hotspots are considered and then analyzed in terms of crime rate, land use, population density, and street type. The elements mentioned above are used to investigate what is happening in and around urban parks in the City of Dallas. Later, three significant parks were chosen for closer examination. Finally, a .25-mile radius around the chosen parks is generated to further understand the region. A .25 mile is

considered because it is considered a walkable distance for pedestrian activities. This section will be further detailed in the following chapters.

3.4 STUDY POPULATION

This research focuses on the City of Dallas population and the residents and visitors of the State Thomas neighborhood and Griggs Park. U. S. Census and demographic data from 2022 are used in this analysis, particularly when comparing sites for a better understanding of population density. This helps to understand the population for whom this research is being undertaken and for whom the design is being created.

Dallas is the largest city in the U.S. state of Texas. According to U.S. Population Census, April 1, 2020, Dallas's population 2020 is estimated at 1,304,379; It is the ninth largest city in the USA by Rank; according to 2018 census estimates, 49.8% is Male population, and 50.2% is Female population, Sex ratio is 99.2 (males per 100 females). In addition, 7.4% are under five, 24.7% are under 18, and 10.7% are 65 years and over. Total housing units are 590,607 (Dallas population, 2022).

3.5 RESEARCH DESIGN

In order to shed light on the research questions and collect a wide range of data, the multi-method approach is followed. This research benefited from qualitative and quantitative methods and previous studies (Deming & Swaffield, 2011, & Guinn, 2013). Literature review analysis, secondary data collection and analysis, case study reviews (Marcus and Francis, 1998), and geospatial analysis utilizing GIS are the methods following in this research (Steiner, 2008; McHarg, 1992). Each of these strategies is discussed in Figure 3:1 and further below.

Using empirical methodologies and GIS tools, this study investigated the location and amount of criminal activity in and around urban parks in the City of Dallas. This study focuses on identifying and evaluating where crime happens to guide future planning and design decisions and inform design on selected neighborhoods of the City of Dallas.

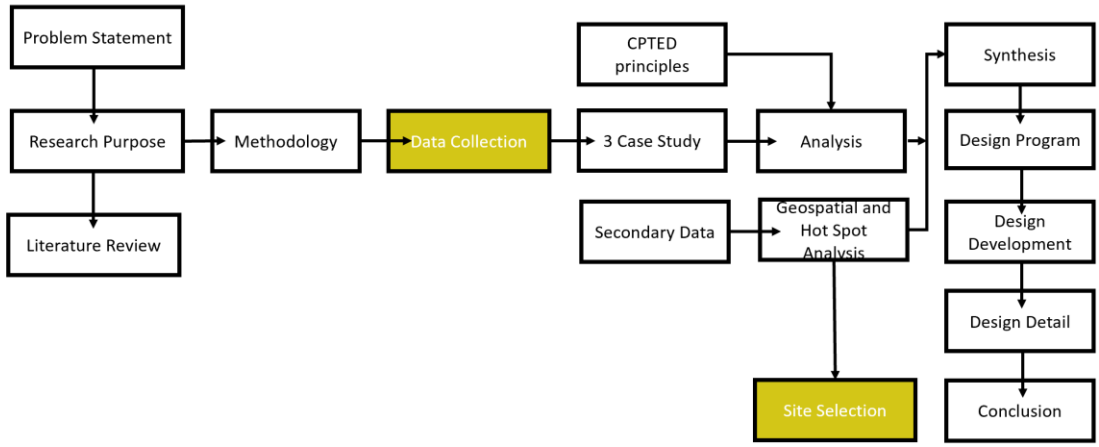


Figure 3. 1 Research Design Diagram

3.6 DATA ACQUISITION

Three sets of data were used in this investigation. These are Secondary Data from the City of Dallas and NCTCOG for geospatial analysis, Case studies, and CPTED. The first is crime data, a secondary database from the City of Dallas open data portal from January 2022-Decemeber 2022 (Dallas Open Data, 2022). The database was used in the inventory and analysis part, which was done with the help of ArcGIS. Then geospatial data (generated from the secondary data Excel database into a point data map) is generated as a point data map. Finally, Google Street View and ESRI online aerial maps are also used throughout the research to investigate the characteristics of these areas.

The City of Dallas, Open Data website, has detailed information about the crime typology, the time and day of the crime, the address where the event occurred, and whether the event occurred indoors or outside. To have a better grasp of recent crime, this study looked at crime statistics from January 2022 to December 2022, which had 135,517 offenses reported.

The North Central Texas Council of Governments (NCTCOG) data center provides geographic data such as aerial photographs, streets, city boundaries, land use, and green and open areas (NCTCOG, 2015). These data sets are compared to crime statistics to identify crime clusters and hotspots and document and detect commonalities among crime locales to advise design and planning processes. The following are the data sources used in this study:

- Land use
- Circulation
- Population Density
- Green and Open spaces
- City Boundary

This study examines three distinct case studies that aim to include safety and security concerns handled at various places. The study gathered data, learned from completed instances, and discovered design traits that could be used to inspire future design. These case studies adhere to Francis' (2001) analysis methodology. The purpose of the case studies is to define the design features and collect data, to learn from professional projects, and to focus on safety design elements.

Existing CPTED principles are studied closely for a better understanding which is then analyzed whether applied in the selected case studies. This analysis helps to find out what else in terms of principles should be given more importance so that it can be considered as new CPTED principles.

3.6.1 SECONDARY DATA AND GIS

The data collected through the City of Dallas Open Data portal is geocoded to be studied and analyzed in connection to other spatial data in Geographic Information System (GIS). The primary role of the Geographic Information Systems (GIS) component is to geocode the spreadsheet data of crime incidents collected from the City of Dallas Open Data site. The goal was to record and connect aspects of the geographical environment, contextual land use, and crime statistics. In addition, GIS provides ways for geocoding each crime's address. The city, state, address, and x, y coordinates were employed to pinpoint the criminal incidents within the Dallas map. The spatial linking of the crime and the designated place allows the region to be investigated.

The general procedure used in the GIS software is as follows:

· Crime and geospatial data acquisition

· Inventory, analysis, and mapping.

· Examine and assess the relationship of crime data points with various land use and environmental elements.

·Aerial observations and documentation through aerial maps on selected crime clusters/hotspots

3.6.2 CASE STUDY

This study looks at three case studies that attempt to incorporate safety and security concerns addressed on different sites. The research gathered relevant data, learned from completed cases, and discovered design characteristics that would inspire future design. These case studies follow the analysis methodologies outlined by Francis (2001). The researcher selects case studies through convenience sampling to find impactful cases in the nation (See Table 3.1).

Sl No	Case Studies	Location	Type
1	Mayor's Office of Criminal Justice Neighborhood Activation Study	New York	Neighborhood
2	Increasing Walking and Bicycling through (CPTED)	Paterson, NJ	Pedestrain
3	Lower Kinnear Enhancement Plan	Seattle, WA	Park

Table 3. 1 Chosen case studies.

The case study procedure follows documentation sources such as historical records, master plans, journals, and previous research, which are then examined closely to develop more concepts that can influence future designs for crime prevention and security. The case studies aim to describe the design elements, collect data, gain information from professional projects, and concentrate on safety design elements such as lighting, vegetation, and management.

3.6.3 REVIEW OF CPTED PRINCIPLES

In the early years, Newman's defensible space was dominant. His proposal, now known as First Generation CPTED, is divided into four principles (Newman, 1972). The principles of first Generation CPTED include (CPTED Brief, 2023):

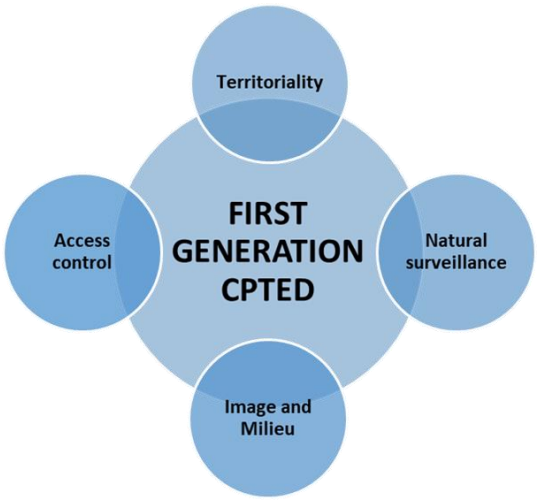


Figure 3. 2 CPTED first generation principles

1. Access Control - This technique uses environmental design to assist in controlling entrance and exit locations. It directs both positive and negative park visitors in a definite direction. Controlling access to the location makes criminals and negative users feel uncomfortable and less likely to conduct a crime.
2. Surveillance -This removes physical barriers that previously prevented casual users from scrutinizing the space. Lighting, landscaping arrangement, "windows" of observation, and fewer barriers are all examples of how design may improve surveillance.
3. Territorial Reinforcement - A notion that entails assisting a procedure that transfers ownership of a space to a group of lawful users with the objective of owning and caring for the space. Because the unfavorable users will be monitored more closely, this aids in eradicating or decreasing nuisance behaviors.
4. Image and Milieu**:** Newman also believed that inhabitants' social traits, such as their opinion of adjacent locations, whether they were afraid of public areas, and the conditions of nearby land uses, were related to urban safety.

According to International CPTED Association (ICA), new concepts in criminal geography, known as environmental criminology (Brantingham & Brantingham, 1981), such as activity generators, crime displacement, and movement predictors, were incorporated into CPTED. In addition, social definitions of citizen engagement and community support were replaced with spatial descriptions of metropolitan areas, shifting the focus away from people and toward offender decision-making.

Thus, in 1997, a presentation at the International CPTED Association's annual conference established the notion of Second Generation CPTED (Cleveland & Saville, 1997). The Second

Generation CPTED restored social ideas into CPTED to correct the imbalance caused by the opportunity decrease in physical locations. Unlike previous social crime prevention programs, which concentrated on vast swathes of society, Second Generation CPTED focused on small-scale surroundings, known as a proximal orientation. The proximal approach unites Second and First Generation CPTED into a coherent community-building framework.

The principles of Second Generation CPTED include (CPTED Brief, 2023):

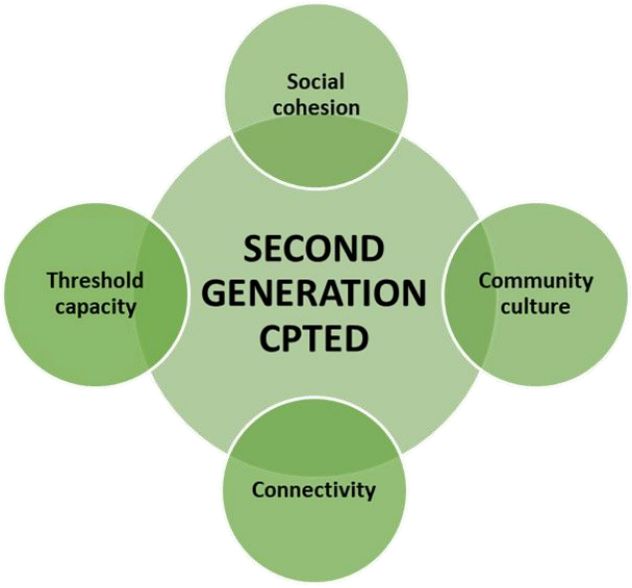


Figure 3. 3 CPTED second generation principles

1. Social Cohesion: Cohesion tactics improve healthy social interactions among locals while focusing on fixing local concerns. Strategies such as neighborhood watch to reduce crime and improve the quality of life are the aim of this strategy. Proximate social programs- aimed directly within the local neighborhood rather than throughout the entire city - are essential to social cohesiveness. They also frequently use 1st Generation CPTED to promote social programming.

2. Community Culture: This brings individuals together to share a shared goal. In this situation, the purpose is distinct from cohesiveness techniques that address specific issues. Community culture initiatives help promote 1st Generation CPTED by assisting residents in developing a sense of community and forming strong bonds. These connections can sometimes be traced back to local cultural events, art and music festivals, and placemaking activities that bring individuals of all genders, ages, and ethnic origins together.
3. Connectivity: Internally oriented neighborhoods tend to exclude others or to implement exclusionary programs that overlook the larger community. This is characterized in planning as the "not-in-my-backyard" syndrome (Kilburn et al., 2014). First, Generation CPTED has recently been criticized for being exclusive to certain ethnic or socioeconomic groups (Lee, 2020). Connectivity techniques connect neighborhoods to other levels of government, such as obtaining government financial grants to build new initiatives.
4. Threshold Capacity: The final concept is related to Jacobs' early thoughts for achieving rich and natural diversity in the built environment. She saw land use and demographic diversity as a small-scale phenomenon that should occur in all neighborhoods. The notion of threshold capacity provides different land uses inside the neighborhood, allowing inhabitants to socialize (parks), buy groceries (food outlets), and recreate (sports or entertainment). Capacity methods also protect against land uses that detract from a location's safety, such as too many alcohol-serving restaurants or drug-dealing places, resulting in criminogenic land uses (Saville, 1996).

No single solution will reduce all crime, as with all CPTED concepts; they should be deployed in combinations based on a comprehensive understanding of the local situation. However, the history

of CPTED implies that all First and Second Generation CPTED concepts must be considered in comprehensive urban planning and community development.

3.7 DATA ANALYSIS PROCEDURES

While secondary source data is studied using ArcGIS, case studies are analyzed using Francis' Case Study Method (Francis, 2001). The preparatory stages for the data gathered from the City of Dallas Open Data portal include exporting the descriptive criminal statistics into an Excel spreadsheet and cleaning minor structural problems such as space and repeated incidents. The spreadsheet was revised and double-checked for accuracy. The data was cleaned three times before being merged for total occurrences. Later this data is geocoded and then analyzed using GIS hotspot analysis which is discussed below.

3.7.1 HOTSPOT ANALYSIS

Each hotspot related to the urban park is a study area in this study. Once the crime data is geocoded, GIS generates it as point data. This point data is then converted as a square polygon fishnet with dimensions of 1500' feet by 1500' through optimized hotspot analysis to evaluate crime study better.

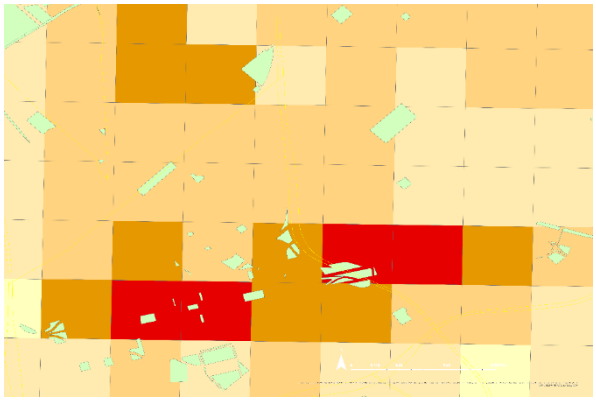


Figure 3. 4 Hotspot analysis example

The highlighted regions in the fishnet investigation were identified as crime concentrations. Figure 3.4 shows instances of fishnet findings. Finally, parks and the optimized hotspots layer are merged, resulting in a spatial join that considers the parks' proximity to each hotspot.

The urban parks associated with homeless people and lively nightclubs are neglected because such areas are apparent crime hotspots. Instead, the emphasis was primarily on the neighborhood parks. As a result, the findings supplied conclusions identifying the significance of what spatial features contribute to the criminal activities occurring at that hotspot.

When the optimal hotspot analysis with the park layer is completed, all parks connected with the hotspot are selected for further investigation. Housing density, street typology, crime count, population density, and land use layers are overlaid, and three urban parks connected with hotspot regions are chosen. A thorough examination of the three selected places will reveal where specific investigations are required for safety.

Along with the site visits to all three places, the observation procedure was carried out utilizing Google Earth software and street view functions. The aerial photography and the street view panoramic photographs allow one to get a quick glance at and document spatial concerns that may be contributing to criminal behavior. The merging of observations and photo analysis enables the researcher to examine environmental patterns and their contextual relevance to crime collectively. This stage of the research focuses on the hotspots and their spatial surroundings. Street view photos have been discovered to help study space design and how element regions may be vulnerable to criminal events.

3.7.2 CASE STUDY ANALYSIS

All CPTED principles are evaluated using the "Likert Scale" as part of the case study analysis. In addition, each case study's design elements are examined closely to develop more principles that can influence future crime prevention and security designs.

CPTED principles, as described in the CPTED literature review, are assessed using the Likert scale method as part of the case study analysis. The assessments are used to understand the design components that were deemed to be important in all three case studies. Design elements in each case study are examined closely to develop more principles that can influence future crime prevention and security designs. The following table shows the criteria used for the assessment.

	Categories	CS - 1	CS - 2	CS -3		
	Location					
	Date Completed					
	Type of Crime					
	CPTED Principles Application					
No	CPTED Principles-(International CPTED Association)				Averages	Recommendations
1	Natural Survillence					
2	Access Control					
3	Maintenance (Image and Milieu)					
4	Territorial Reinforcement					
5	Activity support (CPTED 1997):					
	- Social Cohesion					
	- Community Culture					
	- Connectivity					
	- Threshold Capacity					
	Level of Influence: ○ ◔ ◑ ◕ ●					

Influence Scale: ○ Strongly Disagree ● Strongly Agree

Table 3. 2 Assessment Criteria

3.8 DESIGN PROCESS

The planning and design process uses secondary data analysis, CPTED principal, and case study analysis. Based on the understanding from the analysis, the study was then utilized to create design recommendations for the chosen site as a safer area. By understanding design principles, design

elements are created as strategies for crime prevention methods. These observations and recommendations in Chapter 4 influenced the design. The weighted overlay site selection criteria and extensive suitability studies provide optimal program placement and design suggestions.

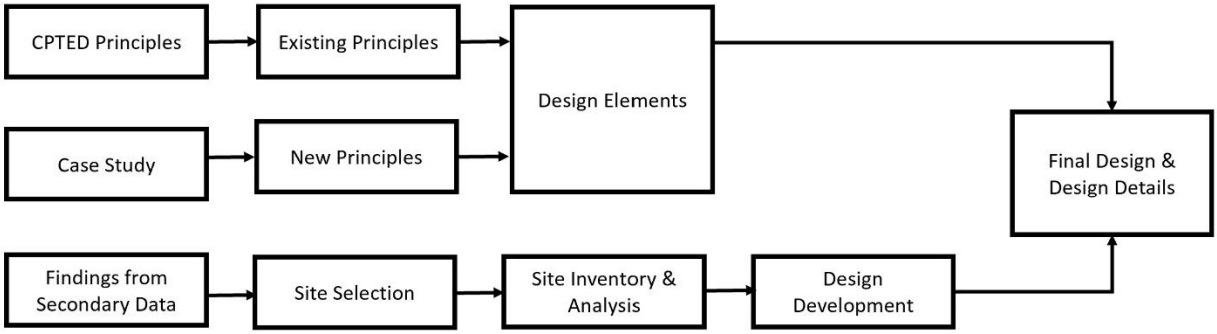


Figure 3. 5 Design Process Diagram

3.9 DELIMITATIONS

The bounds of this investigation were chosen based on data availability and the researcher's closeness to the place. The selected urban park with a hotspot is examined in greater detail with a .25-mile radius for study areas as individual cells. The radius is based on supporting research, suggesting that the .25-mile region is the most remote for typical pedestrian access. GIS displays pedestrian accessibility within a .25-mile radius using network analysis. The immediate around the chosen park is the focus here. Finally, case studies are selected based on convenience sampling, which could be delimitation providing relevant design strategies and elements.

3.10 LIMITATIONS

There are potential limits in the process due to unequal parts in each method approach. There is not enough time allotted in this study to review secondary data. This study was entirely based on secondary data obtained from online resources. As a result, the analysis and findings were produced. The methodology used in this case was based on online resources. Online observations of the site may be out of the current.

3.11 SUMMARY OF RESEARCH METHODS

This research is an evidence-based mixed-method exploration to methodically assess criminal behavior and its spatial context near the urban parks in Dallas. The study is meant to discover hotspots/crime clusters to determine spatial commonalities for the design-related consumers properly. Therefore, the methodology is critical in analyzing the criteria in this research. The chapter divides the crucial items that contributed to the formation of the overarching goal.

This study uncovers the spatial aspects and patterns of urban parks' urban environments that appear to influence criminal activity crime. The study aims to identify spatial features as contributors in some way. This study identifies which component is a driving element concerning the hotspots on the diagram. Landscape architecture and design are influential in developing approaches demonstrating techniques to improve societal welfare further. The following chapter delves more into the findings from this perspective point.

CHAPTER-4

ANALYSIS AND FINDINGS

4.1 INTRODUCTION

The first section of this chapter provides an overview of the research project. The results of the data collection techniques are then presented. Next, the analysis of crime data is displayed in the form of coordinate points to provide the viewer with a clear picture of the incidents that occur in and around the City of Dallas' urban parks. This chapter provides an overview of the findings from each contributing aspect, and it finishes with a brief synopsis of the findings in connection to the urban environment.

4.2 CASE STUDY

This research will examine three case studies (Francis, 2001; Marcus & Francis, 1998) that aim to integrate safety and security. The study will collect data, learn from professional work, and identify design qualities that inspire future design. This approach is based on documentation sources such as historical documents, master plans, journals, and past research, which are then extensively reviewed to produce more concepts that can impact future crime prevention and security designs. The purpose is to define the design aspects, collect data, learn from professional projects, and focus on safety design elements like lighting, vegetation, and maintenance.

4.2.1 CASE STUDY-1:

MAYOR'S OFFICE OF CRIMINAL JUSTICE NEIGHBORHOOD ACTIVATION STUDY, NY (Neighborhood activation study, 2018).

Project Name: Mayor's Office of Criminal Justice Neighborhood Activation Study, NY

Location: Brownsville in Brooklyn and Morrisania in the Bronx, New York

Date Designed/Planned: 2014

Construction Completed: 2017

Architect(s): Studio Gang Architects and Urban planners

Client/Developer: Mayor's Office of Criminal Justice (MOCJ), Police Department (NYPD), Department of Design and Construction (DDC), Studio Gang (Architecture and Urban Planners).

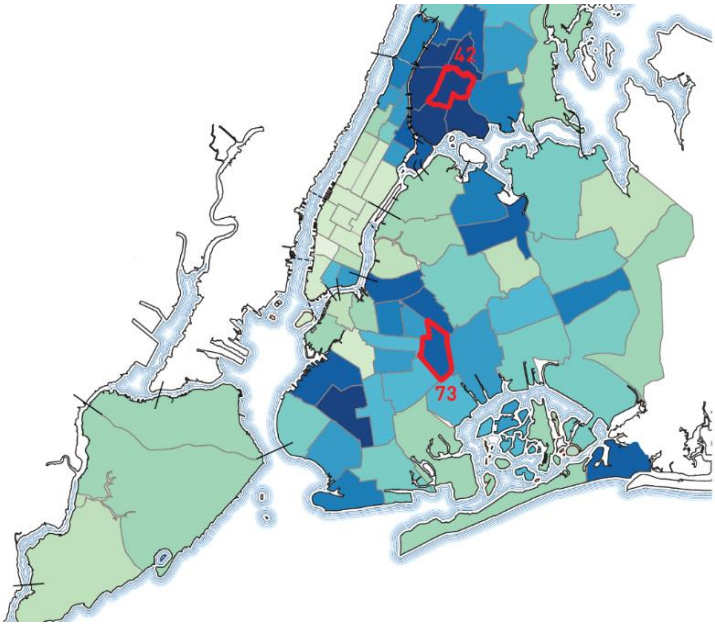


Figure 4. 1 Study Area (Source: Neighborhood activation study, 2018).

Context:

As part of the Mayor's Action Plan for Neighborhood Safety, the team investigated how design can be used to help reduce crime and build positive relationships between police and the people who live in the neighborhoods where they serve (Neighborhood activation study, 2018). The outcome is a Neighborhood Activation Study that provides techniques and specific urban design and architecture recommendations for two New York communities. These suggestions apply to police stations, parks, libraries, roadways, and other elements of a neighborhood's-built environment (Neighborhood activation study, 2018).

The Study identifies and depicts design and construction projects in Brownsville (Brooklyn) and Morrisania (the Bronx) that could be included in the City's capital improvement plans. These concepts and the principles that underpin them are also intended to be instructive for projects in other areas. To that aim, the Study discusses its methods for evaluating what kind of projects should be undertaken and how to decide where those investments should be made. Finally, the Study offers policies, initiatives, and partnerships that could serve as vehicles for project implementation and stewardship.

Project Background and History:

Although the fact that crime has fallen to historic lows in New York City over the last two decades, neighborhoods such as Brownsville and Morrisania continue to lead the city not only in terms of significant crime and shootings but also in terms of high rates of asthma and diabetes, low educational attainment, and employment. Given this concentrated disadvantage, the Mayor's Office of Criminal Justice (MOCJ) promotes coordinated investment and problem-solving through place-based initiatives. However, improving life in these areas requires diverse local and civic partners to address intersecting challenges creatively and systematically (Neighborhood activation study, 2018).

Design Development Process:

The study brought together people and government officials to reimagine and engage the built environment to minimize crime. Studio Gang undertook six months of intensive research involving 65 community organizations and 21 city agencies. The study used mental health, criminal justice, and economic development experts to analyze evidence-based research, city plans, and reports. Mayor's Activation Plan (MAP) gathered detailed design recommendations from stakeholders, such as improved lighting, public art, and community programming, as well as infrastructure

solutions, to help transform local precincts and public properties into transparent and inviting spaces that support productive encounters between police officers and residents and provide residents with access to economic, employment, and recreational opportunities. This study demonstrates that Neighborhood Activation and deliberate design may result in safer, more equitable, vibrant and healthy areas (Neighborhood activation study, 2018).

The following steps have been taken in this study:

- Identify the focus neighborhoods with the most need.
- Overlaying crime data on to New York city housing authority.
- Locate the areas with the most opportunity once the neighborhoods with the highest need have been found. (Opportunity is defined as Density of youth, Credible community-based organization, Critical mass of civic assets, Underutilized public spaces, the mix of street types, Planned capital investment, and Economic opportunity).
- Hardship Index is also considered (Crowded housing, Poverty race, unemployment, adults without high school equivalence, age dependency ratio, and per capita income).

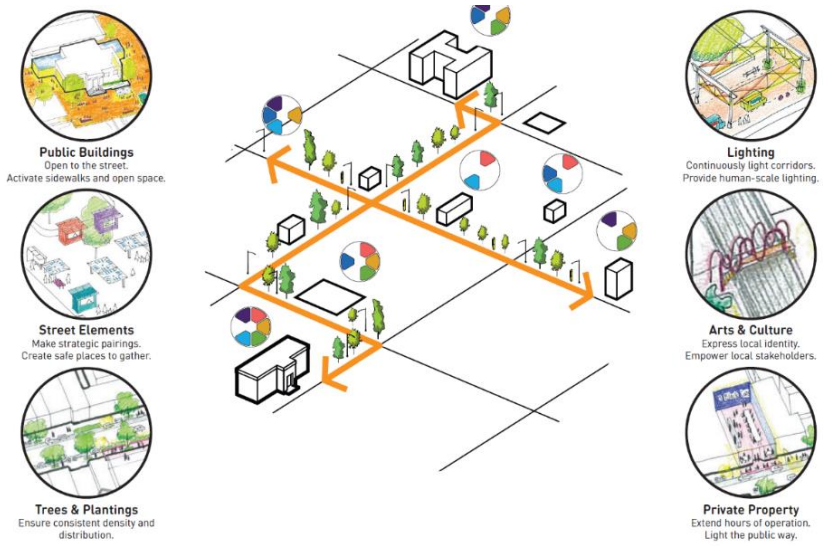


Figure 4. 2 Design element recommendations for the neighborhood activation study, NY (Source: Neighborhood activation study, 2018).

Program Elements: Major program elements in this project includes Engaging the real experts, prioritizing youth, enabling social connections, addressing the complex roots of crime, starting with what is there, co-locate activities, community organizations, and service providers, reducing territoriality, expanding activity on public property, light the night, reduce barriers to local commerce, invest in dignity, provide equity in maintenance (Neighborhood activation study, 2018).

Maintenance and Management: Providing equity in maintenance was the key. Clean, well-kept areas influence feelings of safety and trust in government. Unfortunately, many low-income neighborhoods lack maintenance partners capable of sponsoring public space initiatives or the staffing required to maintain them open for extended hours. Equitable investment in staffing and capacity building is made to ensure the success of community activation methods.

Criticism: A landscape architect was not involved in this project, even though the project has vegetation as one of the critical design elements. The project focuses on increasing community

Figure 4. 3 Program elements proposal for the neighborhood activation study, NY (Source: Neighborhood activation study, 2018).

engagement without discussing sufficient territoriality notions (Neighborhood activation study, 2018).

Significance and Uniqueness: Specific design concepts respond directly to specific locales, as well as communication and collaboration with people who live and work there and are thus most effective in the environment from which they were created. On the other hand, the iterative and reflective process outlined in the study is intended to be useful as a set of principles and methodologies for other communities to adopt in leveraging design and capital investments as a strategy to reduce violence and improve quality of life at the neighborhood scale.

Limitations: Residents were involved at all stages of the project's development and may have different ideas and suggestions at each level.

Generalizable Features and Lessons: Design strategy has a more significant impact on modifying an environment. Activity support was one of the key strategies used here. Specifically, in this study, community engagement and developing activities that encourage people to leave their homes can increase the number of eyes on the street, lowering crime rates. It can result in violence prevention, more job opportunities, and maintained environments are some of the keys. Safety comes from working as a team rather than an authority taking the initiative.

4.2.2 CASE STUDY-2:

INCREASING WALKING AND BICYCLING THROUGH CPTED, CITY OF PATERSON, NJ (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Project Name: Increasing walking and bicycling through CPTED, City of Paterson, NJ

Location: Paterson, New Jersey

- Location 1: North Main Street between Haledon Avenue and Clinton Street
- Location 2: East Main Street between Haledon Avenue and Short Street
- Location 3: Rosa Parks Boulevard between Lafayette Street and Broadway
- Location 4: 10th Avenue between E. 29th Street and E. 24th Street
- Location 5: Ellison Street between East 18th Street and Straight Street
- Location 6: Market Street between Summer Street and Madison Avenue

Date Designed/Planned: June 2013

Construction Completed: November 2014

Cost: $110,000

Architect(s): Arterial Designs

Client/Developer: New Jersey Department of Transportation

Managed By: City of Paterson

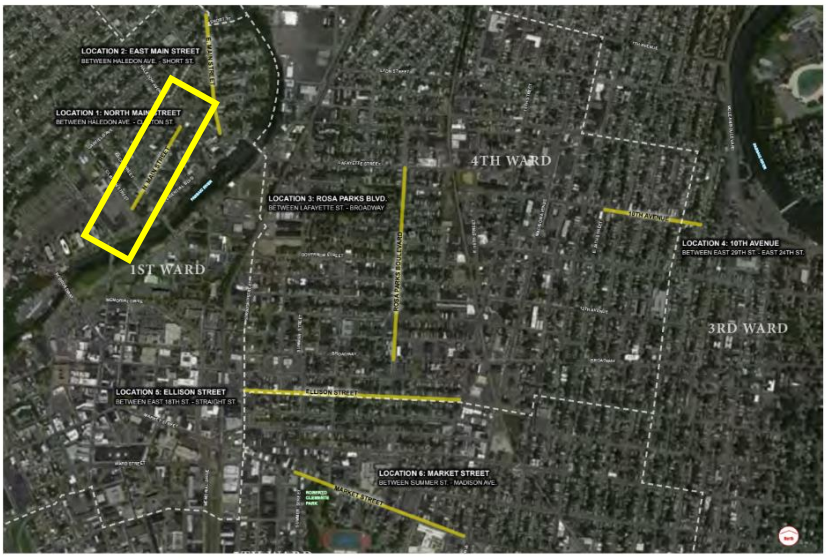


Figure 4. 4 Study Area (Source: Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Context:

Paterson is regenerating the city and confronting brutal gangs and drug-related crime with a multi-pronged approach (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015). One of the primary tactics that the city will use to reduce crime on public streets is Crime Prevention through Environmental Design (CPTED). CPTED has been used for over three decades and is based on twelve principles that can impact behavior before committing a criminal act.

The City of Paterson and Together North Jersey chose Arterial to lead a globally recognized team of specialists in developing the city's CPTED strategy. Project for Public Spaces (PPS) and Gregory Saville, a nationally recognized CPTED expert, were among the team members. Arterial began the initiative by collaborating with the city to form community "CPTED Teams" comprising community members and other stakeholders. Gregory Saville provided comprehensive CPTED training to the teams. They were then tasked with engaging their neighbors and working with the consultant team to build a CPTED strategy for their community. This community-driven approach not only resulted in CPTED plans for each neighborhood but also assisted the city in developing the capacity to expand this program citywide. The result was a detailed CPTED Plan for six areas and a CPTED Toolkit that other neighborhoods can use (Jain, Brown & Sinclair, 2020).

Project Background and History Brief:

The North Main Street, East Main Street, Rosa Parks Boulevard, 10th Avenue, Ellison Street, and Market Street CPTED Project aims to improve neighborhood safety in the city's six crime-ridden areas. Because of gang violence, shootings, and drug-related crimes, the city recognized these corridors. Paterson was one of the ten most dangerous cities in New Jersey in 2010, with a violent crime rate of 10.73 (per 1,000 people), about 3.7 times the state average (Paterson Times, P. T., 2015). As a result, the City of Paterson CPTED Project also aspired to create a CPTED program

that could be scaled up and expanded to similar neighborhoods around the city. Furthermore, the program is consistent with Passaic County's Building a Culture of Health: Blueprint for an Action plan, which identifies public safety as a priority for improving health outcomes (Jain, Brown & Sinclair, 2020).

Design Development Process:

The project strategy was built on the notion that "CPTED is something that is done with the community, not for the community." As a result, both the challenges and solutions uncovered via the project originated from community members, with the project team's assistance.

Initially, the city and the consultant team worked to identify members for a CPTED team of residents and representatives from key local government and non-profit organizations such as the Paterson Police Department, Division of Planning and Zoning, Neighborhood Assistance Office, and Department of Public Works. The selected members were invited to participate in an 8-week intensive CPTED/Safe Growth program organized by a team of nationally recognized CPTED experts, including Criminologist and Urban Planner Gregory Saville, who also led the Safe Growth/CPTED Project training in New Orleans, Louisiana. During the training, participants learned more about CPTED, did a preliminary assessment of the six corridors to evaluate current conditions and problems, and coordinated a community survey to get citizen input on potential difficulties and solutions (Jain, Brown & Sinclair, 2020).

After the training, the project featured a second round of community outreach and engagement activities, including public seminars with citizens and local leaders. These programs were designed to engage low-income, minority, and senior residents. They were arranged by the existing CPTED team in collaboration with local community centers through Paterson Habitat for Humanity, a non-profit organization in the city of Paterson. A brief talk on CPTED was followed by a field audit in

which participants noted safety concerns and issues. Participants also completed a safe places audit form tailored to residents with no or limited CPTED training.

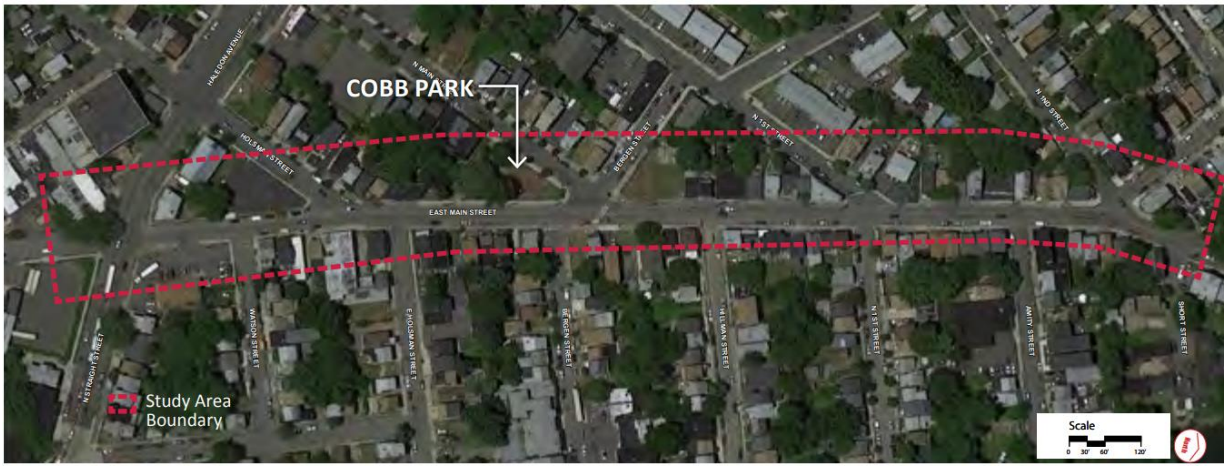


Figure 4. 5 Study area for increasing walking and bicycling through CPTED (Source: Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Program Elements:

East Main Street is a small-scale commercial corridor that stretches from Haledon Avenue to Short Street. This section of East Main Avenue is primarily residential, with only a few convenience stores and small restaurants. Along the residential streets intersecting with East Main Street, many unoccupied or abandoned properties exist. This is mainly owing to the neighborhood's proximity to the river and the resulting flooding during significant rain events. Many portions of this neighborhood were inundated by water after Hurricane Irene slammed the east coast in 2011 (Jain, Brown & Sinclair, 2020).

Despite the many vacancies, the corridor has a family-friendly atmosphere, and the streets are moderately congested with walkers. A beautiful, bright children's playground in the study area is one of the corridor's most valuable attractions. This park, Cobb Park, serves as a vibrant, family-oriented focal point for the community.

Figure 4. 6 Hotspot A & B (Source: Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Figure 4. 7 Serious crime spots (Source: Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

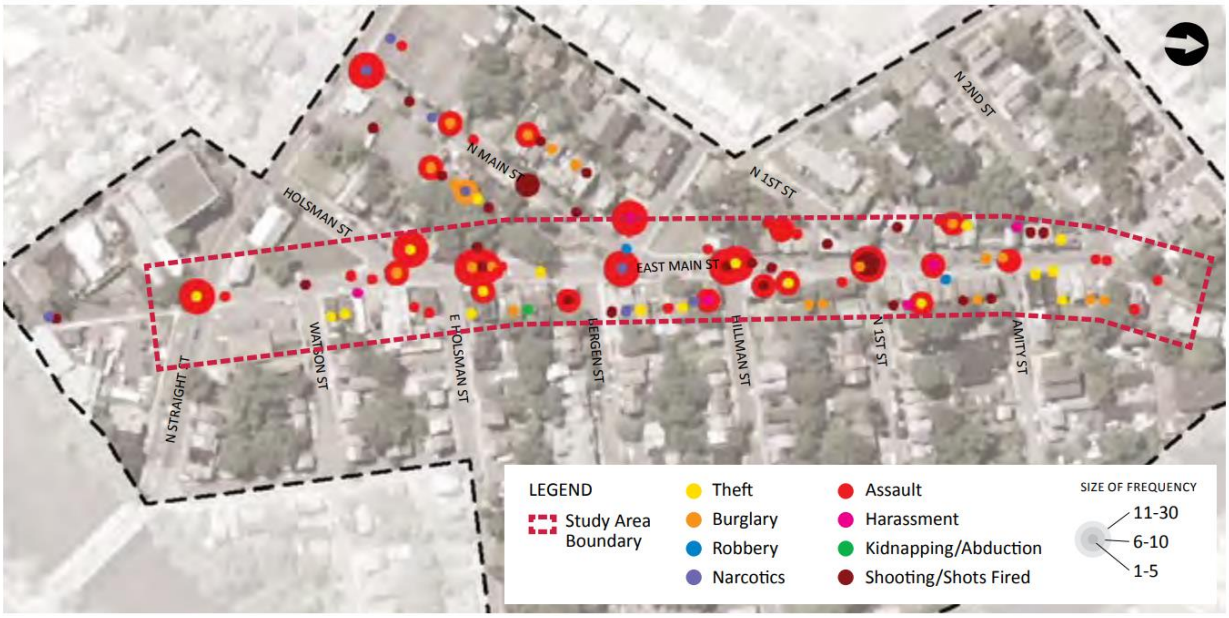


Figure 4. 8 Quality of life crime spots (Source: Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

- Territoriality:

Strategy-1: Development of Cobb Park - Cobb Park, a little pocket park with a new brightly colored playground, is located in the corridor's middle. This new playground, which appears to be well used by children and families, symbolically recovered this area in the heart of the town. Building on this achievement, strategies should be developed to allow the community to reclaim the streets and public spaces on East Main Avenue.

Figure 4. 9 Proposed Cobb Park Concept (Source: (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

With the development of Cobb Park, new additions were considered including:

- Signages
- Community Street Quilt (Mural designed by the community and painted onto the street).
- Picnic area and patrolling

Strategy-2: Vacant or abandoned properties - This neighborhood has a disproportionate amount of vacant or abandoned properties along East Main Street and on intersecting residential streets. Criminal activity is concentrated around these properties, and actions should be implemented to restore this private space. While broad ideas are covered in this report's Common Issues and ideas portion, two vacant homes in this neighborhood present a unique opportunity due to their closeness to Cobb Park. Together with Cobb Park, these two locations have the potential to become an activity and cultural focus for the neighborhood (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Property 1 (NW corner of Bergen St. and E. Main Ave): vacant lot converted into pairing to Cobb Park with a skateboard park, a tire climbing park, or other such activities.

Property 2 (NE corner of Bergen St. and E. Main Ave.): Residential lot converted to community garden.

Strategy-3: Traffic Claiming - Curb extensions, neck-downs, highly visible crosswalks, speed humps, 4-way stop signs, and other sophisticated pedestrian signals should all be considered for these intersections as traffic calming tactics and additions.

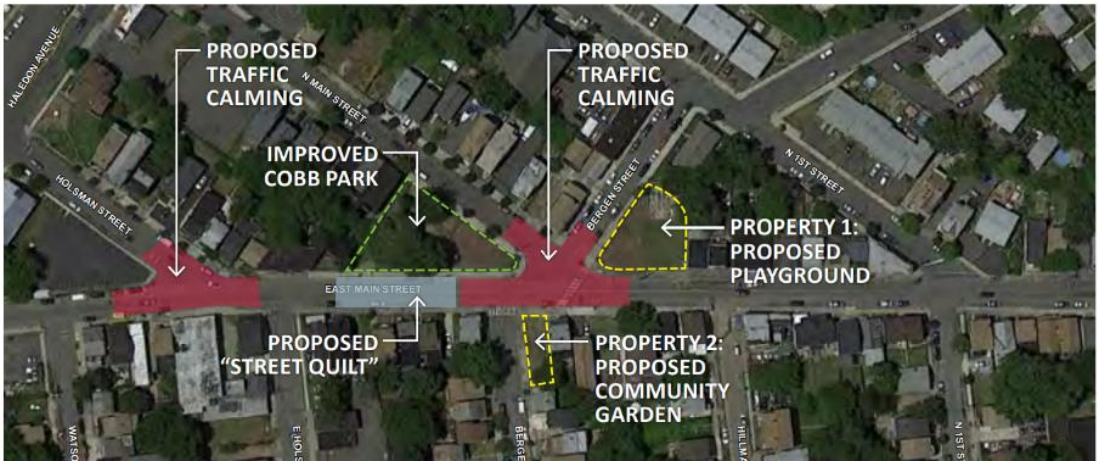


Figure 4. 10 Place making diagram (Source: (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

- Image:

Sidewalk- Almost half of the sidewalks on this stretch of road are broken or disintegrating. New ADA corner ramps have been constructed. However, the fractured sidewalks make it difficult or impossible for a person with a physical impairment (wheelchair, walker, visually impaired.) to navigate the sidewalks, rendering the ADA-compliant ramps ineffective. The nearby property owner is responsible for sidewalk maintenance. If there are broken or crumbling sidewalks, the property owner should be alerted and aware of the ordinance and the associated liability concerns

(Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Curbs- Most curbs along the route are made of old granite or stone. The road has been repaved several times without the curbs being reset. As a result, the curb is less than 3" high throughout most of the corridor. Because of the lack of curb reveal, cars mistakenly drive onto the sidewalk, causing it to fracture and disintegrate. The curbs along the corridor should be replaced with a 4" reveal. This will necessitate milling and repaving the road (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Trash Removal- All trash cans should be emptied regularly to avoid overflowing and spilling into the street. Unemptied trash receptacles should be reported to the Department of Public Works (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Trash can quality and location- Trash cans should be placed in high-traffic areas such as Cobb Park and outside all food establishments and restaurants. Trash cans should be moved from low-traffic regions to high-traffic ones (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Neighborhood cleanup program- A program should be devised to engage corridor inhabitants in cleaning the street and picking up litter. The children must take part in or lead this effort. Instilling this value young is crucial to the neighborhood's long-term success. This program should be organized with local churches and community partners such as Serenity Baptist Church, Grace Baptist Church, and Habitat for Humanity, all within one or two streets away from East Main Avenue (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Store owner outreach- Owners of neighborhood establishments, such as liquor stores, bodegas, and food stores, should be responsible for cleaning the sidewalk in front of their establishment. In addition, these property owners should be engaged and, if necessary, reminded of the right way to clean and preserve their property (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Graffiti removal program- Graffiti conveys that the community is neglected. It frequently causes anxiety and instability and, if left ignored, can be economically destructive to the neighborhood and the city. Therefore, the city should implement a program for reporting graffiti and getting it cleaned quickly (within a day or two). This type of response will send a message to both the community and the criminal element that the city will no longer tolerate the degradation of these areas (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

- Natural Surveillance:

Street Light Maintenance: More than half of the streetlights on East Main Street were not operating for unknown reasons during an on-site inspection. This could be due to a need for more upkeep. However, residents said gang members or other criminals disable the lights by shooting or hurling things at them. All broken or malfunctioning lights should be documented and reported to Public Service Electric and Gas Co.

Supplemental Street Lighting: Based on the existing spacing and height, it is possible that even if all of the streetlights were operational, there would still need to be more light levels for walkers. Roadways in New Jersey are meant to offer the bare minimum of lighting, generally around 0.5 footcandles. Light levels recommended for a safe and pleasant pedestrian environment range from 2.0 FC to 4.0 FC. Increased lighting levels are especially critical at all intersections and in and

around Cobb Park (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Porch Light Program: The porch light is a warm and welcoming sign of family and comfort. Many cities across the country have implemented "porch light" schemes to offer additional street lighting, reduce crime, and improve the general appearance of the street. Porch Light programs can be as essential or comprehensive as desired, but they encourage homeowners to turn on their porch lights from dawn to night. The initiative may include free light bulbs for households, grants or split costs for residents wanting to install new porch lights, or, in certain situations, an element of public art. These programs are frequently the result of a collaboration between the city, community members, and the local electric provider Public Service Electric and Gas Co.

Trees and Landscape: Cobb Park contains several mature shade trees. While enormous healthy shade trees are beneficial, they have begun to impede sight lines into the park and playground. Therefore, they should be pruned so that all branches that are less than 7' from the ground are eliminated (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

- Land Use:

Within this research region, there is only one liquor store. As previously said, this location is also a crime hotspot. During the site visit and discussions with neighborhood residents, it was discovered that there is extensive loitering outside this liquor shop and the adjacent bodega at all hours of the day. This could be because of the mix of property uses surrounding the booze store. Land use near the liquor store, such as vacant or abandoned properties, a bodega, and single-room occupancy housing, may contribute to this crime hotspot. To address this region's loitering and criminal issues, the City should collaborate with liquor shops and bodega owners. Each use should

be subjected to a Zoning Code evaluation to guarantee compliance. Particular attention should be paid to operating hours, as community members indicated many restaurants are open until the early morning (Crime Prevention through Environmental Design City of Paterson, New Jersey audit of six corridors, 2015).

Criticism: Only Street segments have been picked; the possibility of losing connectivity is high. Concentrating mainly on maintenance was the priority for this project. Implementing new design elements could have been more effective. Activity support was least considered. No landscape architects were involved in this project.

Significance and Uniqueness: The City of Paterson CPTED Project has implemented strategies to solve natural surveillance, image management and maintenance, and territorial reinforcement challenges along the corridors. Different streets which need help within the neighborhood have been selected rather than coming up with strategies. Design response towards the typology of crime at each location was one of the uniqueness noted.

Limitations: The neighborhood was the oldest town, and the level of maintenance attained by maintaining the building facades was low. Focusing on a better management system was the most that could be done to this project because of the age of Paterson city.

Generalizable Features and Lessons: In this study, selecting the spot that requires the most support was successful in the design response. The main goal was to attain safety and security by following CPTED principles as design elements. This shows that implementing CPTED can improve safety and security in a park, pedestrian area, or community.

4.2.3 CASE STUDY-3:

LOWER KINNEAR PARK ENHANCEMENT PLAN, SEATTLE, WA

(HBB Landscape Architecture, 2021).

Project Name: Lower Kinnear Park Enhancement Plan, Seattle, WA

Location: Seattle, WA

Date Designed/Planned: 2009

Construction Completed: 2013

Construction Cost: $110,000

Size: 14.1 acres

Landscape Architect(s): HBB Landscape Architects

Figure 4. 11 *Proposal plan for the Lower Kinnear Park* *(Source: HBB Landscape Architecture, 2021)*

Context: Lower Kinnear Park in Seattle's Queen Anne district is a city-designated landmark. It was acquired in 1887 and is Seattle's first planted park. The Friends of Lower Kinnear Park (FOLK park) oversaw the master planning project for Lower Kinnear Park, which included an intensive public process and design led by HBB landscape architects. In addition, the Seattle Parks Department, Seattle Landmarks Board, Friends of Olmstead Park, Uptown Alliance, Queen Ann

Historical Society, Cascade Bicycle Club, Audubon Society, and COLA (Citizens for Off-Leash Areas) participated in the comprehensive assessment process. Following Seattle Parks' approval of the concept, HBB created construction documentation for phase 1 upgrades, such as restored paths, a reconstructed tennis court, a new off-leash dog park, and accessible open space overlooking Elliott Bay.

Project Background and History Brief:

Kinnear Park is a 14.1-acre park on Seattle's western side of Queen Anne Hill. It has been a City of Seattle historical monument since 2001. It is highly recognized for its history as Seattle's earliest planted park with giant trees, including several "state and city champions." The high slope and bluff of the hill serve as a natural boundary separating the upper and lower areas of the park. Although the upper half of the park was well-kept and well-used, people noticed Lower Kinnear Park deteriorating (Koonts, 2017).

Many visitors did not feel secure or welcome in the park because of the aged infrastructure and low site visibility. The park's proximity to rapid transit, surrounded by neglected houses, made it a hotspot for illegal drug activity. Its low visibility allowed for gang activity and violent criminal occurrences. Unhoused people seeking shelter in the park were particularly vulnerable to abuse; one homeless woman was murdered on a park bench. Finally, a 2009 Seattle Times article detailed a police raid by more than 70 policemen that arrested dozens of drug traffickers who had "taken over Seattle's Kinnear Park." (New Jersey Bicycle & Pedestrian Advisory Council, 2021).

As a result of these difficulties, a group of concerned neighbors and community members formed FOLK Park (Friends of Lower Kinnear Park), a local community organization dedicated to rehabilitating the park, in 2009. In 2010, the organization contracted HBB Landscape Architecture to prepare a concept design and upgrade plan for the park using a Department of Neighborhood

Small Improvement Grant. Its three main goals were to improve safety, protect the park's urban forest and historical significance, and reconnect the surrounding community with its environmental legacy (New Jersey Bicycle & Pedestrian Advisory Council, 2021).

Design Development Process:

Before its renovation, residents were deterred from visiting Lower Kinnear Park because its infrastructure needed to be in order and present a friendly environment. In addition, due to a lack of signage and frightening park entry designs, locals living "200 feet away from the park had no idea that they could even go into the lower part of the park," (New Jersey Bicycle & Pedestrian Advisory Council, 2021, p.12) according to project outreach attempts.

Lower Kinnear Park's environmental elements also contributed to the park's uninviting atmosphere. High slopes and dense forests obstructed visibility and caused blind spots, resulting in an upsurge in criminal activities. Park users frequently felt secluded and vulnerable, and evening lights without natural supervision presented an opportunity for crime.

To address these issues, designers and community members worked to "open up the park" and "get more people from the neighborhood into the park" in order to raise the level of safety and "eyes in the park." Among the specific strategies were, but were not limited to:

- Creating a conspicuous entry with directional signage and park information that is ADA-accessible, walkable, and bicyclist-friendly. In addition, the entry was opened by reducing visual impediments, such as shaving the hillside to increase biological monitoring from adjacent dwellings, streets, and surrounding usage.
- Re-grading slopes to improve visibility and surveillance between routes, walkways, and sports/event facilities.

- Maintaining a clear buffer area between trees/vegetation and trails/pathways allows for longer sightlines and viewing angles. "Try to keep trees 10 feet away from the edge of the trails and large shrubs at least 5 feet away from the trails," says the rule of thumb. Additionally, see-through fence designs boosted visibility around sports and event sites.

Figure 4. 12 Maintenance of the park (Source: Koonts, 2017).

- There is no lighting at night to deter anyone with criminal intent from visiting the park without surveillance. This compelled people with criminal intent to use their lighting, which is more likely to alert nearby citizens and police to illegal behavior.
- Improving wayfinding and a sense of belonging by installing directional signage; informational signage about the park's tree species, birds, and bird sounds; interpretive signage about the park's natural, geologic, and human history; and historic tree marking for awareness and environmental stewardship.

- They are increasing accessibility by providing ADA-accessible entryways, picnic spots, and viewing areas, as well as installing concrete pathways and staircases with railings for further comfort, all while respecting the park's natural setting.
- They were increasing community utilization by renovating/expanding current facilities and introducing new facilities identified through public meetings by the community. For example, a new off-leash dog area drew dog walkers from around the neighborhood and the city, increasing park use by three or four times.

Figure 4. 13 Design proposal before and after (Source: Koonts, 2017)

Role of Landscape Architect: A team of landscape architects from HBB and FOLK Park collaborated on the park's overall design. The phasing completed the design. The HBB team was heavily involved in the project, including site visits, community involvement, and so on. The landscape architecture team completed the entire design proposal with the help of the local CPTED authority.

Program Elements:

Lower Kinnear Park had been abandoned for years due to poor infrastructure and safety issues, and the local community needed to be made aware of or scared to attend the park. However,

because of its historical and environmental value, concerned community people saw it as a significant asset. Furthermore, the park was surrounded by a vibrant community of walkers, runners, trail users, bicyclists, tennis players, and dog walkers who cared intensely about its future. Neighborhood work parties, where locals gathered to clean up and remove invasive species, and fair days sponsored by local companies were among the planned programming events to incorporate the local community in park development. In addition, FOLK Park and other local organizations staged a community event in 2014 to commemorate the park's renovation, which included walking tours, live music, a food drive, and games (Koonts, 2017).

Following the reopening, project stakeholders offered educational tours emphasizing the environmental advantages of the park's trees and urban forest to encourage environmental stewardship. For example, in 2015, Seattle Parks, in collaboration with the consulting team and FOLK Park, built 16 signs in the park demonstrating the environmental advantages of the forest. In addition, the community groups conducted an educational tour for school pupils, which included instruction on the instructional signs and a hands-on lesson on caring for planting beds.

Criticism: Maintenance is one of the main parts of CPTED principles, and it has been a concern in this park before and after the re-development. Even after the renovation, the authorities have yet to indicate activity support programs that take care of maintenance. Social cohesion could have been more considered.

Significance and Uniqueness: The landscape architect was involved in this project. The design has been applied through phases. CPTED principles were attained through design strategies. Electronic security was given more priority in terms of access control.

Limitations: The park is the primary focus of this project. The approach taken in this case study is slightly different from the research. However, the concept of CPTED principal applications is similar. Because our data show no crime within the park, our case study may be limited.

Generalizable Features and Lessons: Lower Kinnear Park's design and enhancement plan includes key first-generation CPTED improvements such as improved natural surveillance, welcoming entrance designs, accessible pathways to viewing locations, an off-leash dog area, and renovated sports facilities, which have drawn the community back to the park and helped reduce criminal activity. The design team talked with local police officers about five years after the project was completed, and they said that the number of crime-related calls in the park had significantly decreased. As a result, the application of CPTED principles was successful.

4.3 LEARNINGS FROM CASE STUDY

4.3.1 Case Study-1: Mayor's Office of Criminal Justice Neighborhood Activation Study, NY

Successful Features: This project provides community engagement opportunities. It primarily focuses on creating a healthy community by incorporating more green and open spaces. Outdoor activity options were strongly encouraged, as they can positively impact people's mental and physical health and result in more people on the streets, which is a crime prevention strategy. Connectivity within the neighborhood and from other neighborhoods was one of the focuses. More vegetation is given priority in all the streets. The importance of light has been discussed regarding the design elements.

Unsuccessful Features: The entire project was centered on strategy. This proposal overlooked the concept of territoriality, which was one of the principles of having safety and security according to CPTED principles (International CPTED Association, ICA, 2023. The main objective was to redesign this neighborhood so that people from outside could easily reach it. It allows for easy

movement of people, but the concept of private and public places was not explored. The main emphasis was on connection, improving the neighborhood while reducing territoriality. The planners focus on allowing people from outside the area to be in the community, which can provide "eyes on the street," yet unidentified persons can still boost crime rates.

Allowing too many activities in the community can disrupt the residents' day-to-day activities. The plan was to add activities allowing people to utilize the spaces 24 x 7. However, this could cause residences to be disturbed. The case study analysis showed that a limited number of the CPTED concepts were considered when developing this crime prevention project.

4.3.2 Case Study-2: Increasing walking and bicycling through CPTED, NJ

Successful Features: The site selection criteria were entirely based on the site's intense need for assistance in terms of safety and security. The initiative is centered on integrating CPTED concepts, which aid in crime prevention. The design solution was based on the crime typology on each street. Vacant and abandoned lands were identified and designed so that people may use them and can bring more people into the streets. Broken streetlights and paving stones were replaced, making the space more unkempt. The area upkeep and maintenance was the most problematic aspect of this project, and the authorities took steps to avoid such concerns in the future.

Unsuccessful Features: Most improvisations were about fixing abandoned sites and rebuilding whatever was previously broken. The case study site has the potential with a mixed-use land use type that includes primarily commercial and residential uses. The design might have been more focused on community participation for the residents. The case study site was old, and it desperately needed assistance with building façade alteration standards that can aid in preserving the historical buildings, making the area for the user safer.

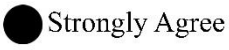
4.3.3 Case Study-3: Lower Kinnear Park Enhancement Plan, Seattle, WA

Successful Feature: This project involved the application of a majority of the CPTED principles with the help of landscape architects. The critical part of this project was redesigning the site in phases. As part of phase 1, all the broken walkways were repaired. In addition, this project focused on prioritizing electronic security in terms of access control. Proving more seating spaces and graffiti removal was also one of the major initiatives. Regular patrolling was done based on timings.

Unsuccessful Features: The trees were overgrown, and little thought was paid to that aspect. This park should have had more lighting and signages, especially near seats and trails. Different pedestrian activities, such as bicycling and pedestrianism, should have had a high potential. After all, only the park was considered while redesigning for safety and security; nevertheless, considering the surroundings could have resulted in a favorable outcome regarding social cohesion.

4.4 ASSESSMENT OF ALL CASE STUDIES

This section explicitly assesses the case studies through the lenses of CPTED. The CPTED principles are based on design elements, design analysis, and features derived from the CPTED literature review using the Likert scale method. The derived assessment is then summarized, and the case studies are evaluated to develop new design principles for improved safety and security. The table below shows the CPTED principles considered for the assessment purpose.



No	CPTED Principles-(International CPTED Association)
1	Natural Survillence
2	Access Control
3	Maintenance (Image and Milieu)
4	Territorial Reinforcement
5	Activity support (CPTED 1997):
	- Social Cohesion
	- Community Culture
	- Connectivity
	- Threshold Capacity
6	

Table 4. 1 Assessment criteria

	Categories	Mayor's Neighborhood Activation Study	Increasing walking and bicycling through CPTED	Lower Kinnear Park Enhancement Plan		
	Location	New York	New Jersey	Washington		
	Date Completed	2017	2014	2013		
	Type of Crime	Murder, Rape, Robbery, Felony Assault, Burglary	Gang-Violence, Shootings, and Drug-Related	Gang Activity, Homeless and Murder		
	CPTED Principles Application	No	Yes	Yes		
No	CPTED Principles-(International CPTED Association)				Averages	Recommendations
1	Natural Survillence	●	◑	◔	◔	Natural Survillence
2	Access Control	◔	◔	●	◑	Access Control
3	Maintenance (Image and Milieu)	●	●	●	●	Maintenance (Image and Milieu)
4	Territorial Reinforcement	○	◑	◔	◔	Territorial Reinforcement
5	Activity support (CPTED1997):	◔	◔	◔	◔	Activity support (CPTED1997):
	- Social Cohesion	◔	◔	◔	◔	
	- Community Culture	●	◔	◑	◑	
	- Connectivity	●	○	○	◑	
	- Threshold Capacity	●	◑	◔	◑	
6		◑	○	●	◑	Environmental security (Adequate landscaping)
7		●	●	◔	◔	Physical security (lighting)
8		◑	○	●	◑	Electronic security.
8		○	◔	●	◑	Gates and Fences

Level of Influence: ○Strongly Disagree ●Strongly Agree

Table 4. 2 Assessment of all the case studies

4.5 LESSONS LEARNED FROM ASSESSING THE CASE STUDIES

According to the summary of the assessment findings from the case studies (See Table 4.2 above), design features play a vital role based on CPTED principles.

As per the case study analysis, depending upon the crime typology, land use, density, and certain design features should be given preferences and can be considered as new CPTED principles.

Three independent case studies discuss topics such as:

- Landscape Design
- Lighting
- Electronic security
- Gates and Fences

Landscape: The key is adequate landscaping. It discusses plant selection criteria, such as typology of trees, bushes, hedges, and lawns should be chosen. Each street has its own character, and plant selection should reflect that.

Lighting: Lighting comprises various levels of light for various purposes. It is divided into four categories: street lighting, pedestrian illumination, building lighting, and walkway lighting. Each must be placed according to the need and purpose.

Electronic security: Technology has to be considered for attaining safety and security. Electric security is important in improving community safety and security. This can be achieve through smart security cameras, sensors and alarms, neighborhood watch apps, electronic access control, virtual neighborhood patrols. It entails using electrical systems and equipment to prevent, detect, and respond to potential threats and intrusions (Terzija et al., 2010).

Gates and fences: According to a report by the National Institute of Justice, gates and fences are effective in reducing crime in residential areas by controlling access and providing physical barriers. The report highlights the importance of material selection, height and design, gate placement, gate control mechanisms, and visibility for effective security (Feins, Epstein & Widom, 1997).

4.6 DESIGN STRATEGY DEVELOPMENT FROM LITERATURE & CASE STUDY ANALYSIS

This section attempts to incorporate the ideas from the literature and the case study for creating design strategies to address safety and security concerns around parks. The CPTED techniques and principles hope to limit opportunities for criminal activity while increasing inhabitants' and visitors' feelings of safety. Here are the fundamental principles from the analysis and findings:

1. Natural Surveillance
2. Access Control
3. Maintenance
4. Territorial Reinforcement

5. Activity Support
6. Landscape Design
7. Lighting
8. Electronic Security
9. Gates and Fences

1. Natural Surveillance:

Buildings and public places should be designed for clear sight lines and visibility, which may prevent criminal activities and allow people to watch and report unusual behavior.

It can be achieved through (Minneapolis City Council, 2020):

- Proper and consistent lighting
- Transparent or lower fences
- Removal of unwanted walls
- Building standards for growing vegetation
- Activating unused or abandoned corners

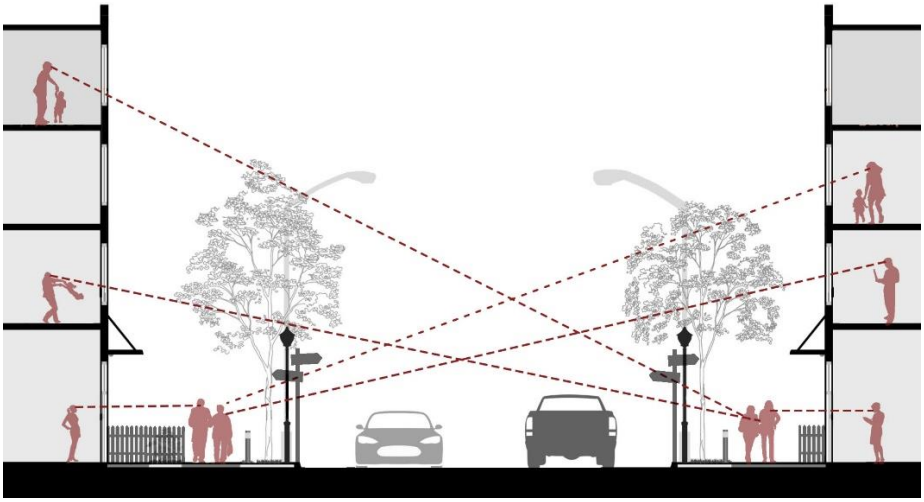


Figure 4. 14 Natural Surveillance Representation

2. Access Control:

Design elements such as fences, gates, or landscaping might inhibit criminal activities by making entering or exiting an area more difficult.

It can be achieved through ((Minneapolis City Council, 2020):

- Defined entries and exits.
- Community culture development (Gathering and amenity spaces only for the community)
- Security system for entry and exit
- Plants with thorns or prickly leaves can be used near fences or walls to make climbing more difficult.
- Access control for fences, gates, and doors.

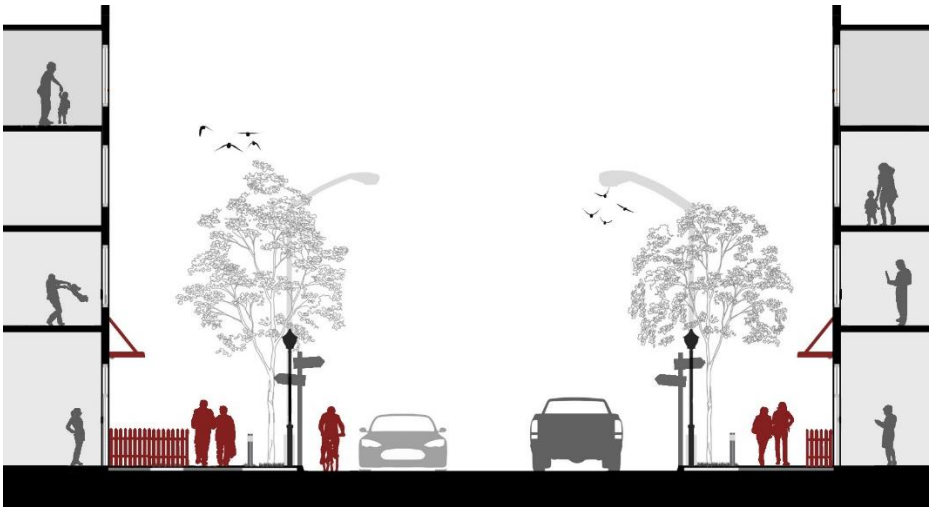


Figure 4. 15 Access Control Representation

3. Maintenance:

Regular building and public space repair and upkeep can signal that an area is cared for and monitored, deterring criminal behavior, and making people feel safer.

It can be achieved through (Minneapolis City Council, 2020):

- Taking care of the landscaping and street and road pavements.
- Maintaining the facades of the building.
- Repairing/ replacement of outdoor lighting and broken windows and doors.
- Eliminating or no opportunities for graffiti
- Activating unused common spaces

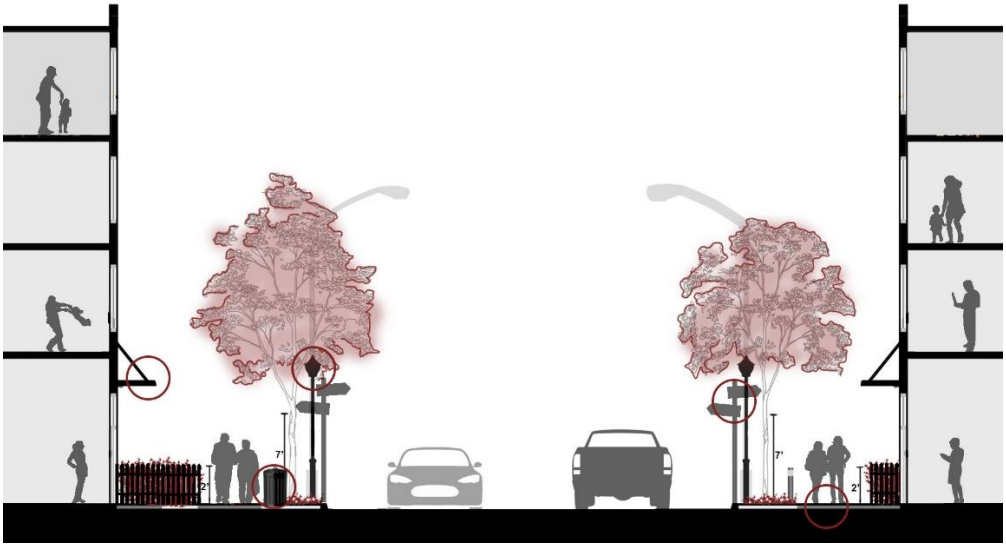


Figure 4. 16 Maintenance Required Areas

4. Territorial Reinforcement:

Using design elements such as fencing, landscaping, or illumination to create a sense of ownership and territoriality over a location can prevent criminal activities by suggesting that the space is monitored and cared for.

It can be achieved through:

- Management responsibility must be taken care of private, semi-private, semi-public, and public ownership for every space.
- Define spaces using landscaping, signages, fences, seating, paving and lighting.

- Usage of bollards

(Public: Spaces that are open for all to travel.

Semi-public: Public pedestrian space.

Semi-private: Front yard, alleys, and driveway leading to homes.

Private: Privately owned porch/patio and home)

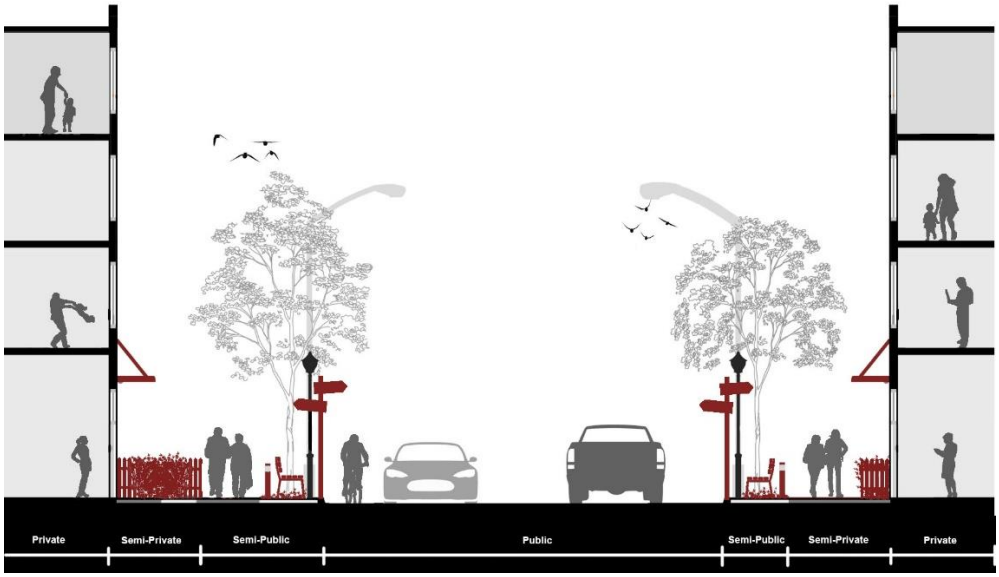


Figure 4. 17 Territoriality through defining spaces.

5. Activity Support:

The design and usage of spaces to encourage beneficial activities and behaviors such as community participation, social connection, and recreational opportunities. Activity support can help establish a feeling of community and increase social connection by encouraging positive activities and behaviors, which can improve safety and security.

It can be achieved through:

- Passive – Pools, parks, playground, gym, community rooms.
- Active – Scheduled event spaces for picnics, concerts, sports, and community gatherings.

6. Landscape Design:

Landscape design can be used to establish natural barriers, guide pedestrian flow, and improve visibility, all of which can assist in deterring criminal activities while also making the environment more beautiful and welcoming. The selection of planting variety is essential for achieving safety and security. Guidance from a landscape architect is always preferred to accomplish this goal.

It can be achieved through:

- Plant selection: Choose low-maintenance plants that won't obstruct sight lines. Avoid using plants with dense foliage that could provide cover for criminals.
- A clear line of sight: Adequate landscaping should allow for clear lines of sight, reducing opportunities for criminals to hide and creating a more open and visible space. Choosing trees and shrubs that grow at reasonable heights is preferred. After a certain period of time, overgrown vegetation should be removed.
- Collaboration among the neighbors: Landscaping can be used in partnership with the neighbors to create a safer community. This can include initiatives such as community gardens and harvest events, which can bring people together and develop a sense of community ownership and pride.
- Natural barriers: Usage of thorny bushes in required areas are preferred to deter criminals from entering a property. These barriers can create a physical deterrent, making it difficult for criminals to approach the property.

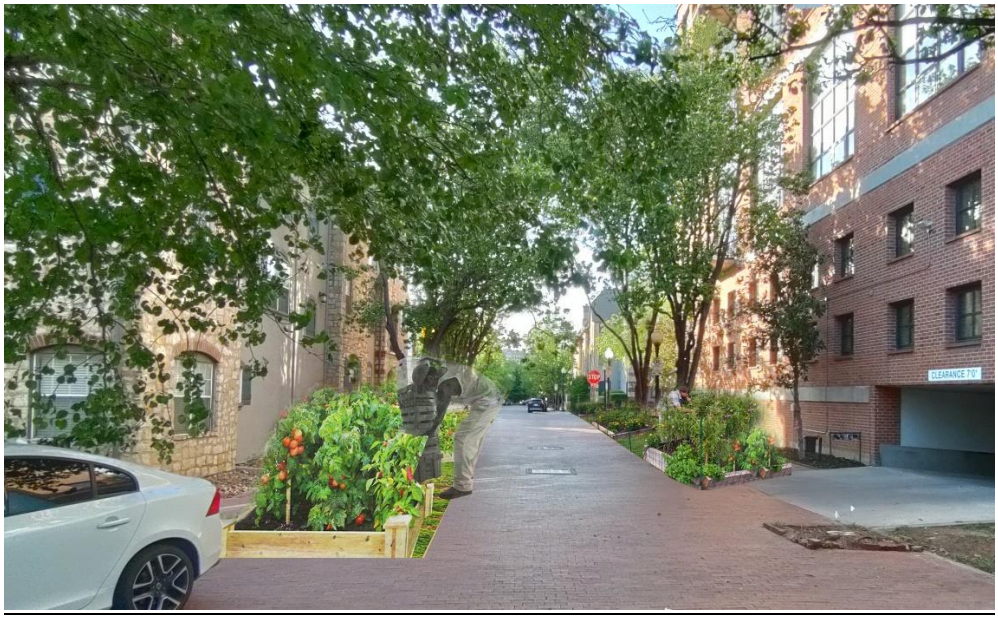


Figure 4. 18 Example showing collabration among neighbors through landscaping (Community gardening)

7. Lighting:

Appropriate lighting may increase visibility and natural surveillance, reducing criminal activities and increasing feelings of safety. Use lighting to highlight pathways, entryways, and parking areas and ensure that lighting fixtures are well-maintained and functioning correctly.

It can be achieved through:

- Street lighting
- Pedestrian lighting
- Pathway lighting
- Outdoor building lighting

Figure 4. 19 Lighting varieties

8. Electronic Security:

Electronic security is an essential component of CPTED and can enhance the effectiveness of the overall approach. Here are some examples of electronic security measures that can be used to complement CPTED:

It can be achieved through:

- Smart security cameras: Installing intelligent security cameras in key locations around the neighborhood can help deter criminals and provide evidence in case of a crime. These cameras can be accessed remotely and provide real-time footage, making monitoring the community for potential threats easier.
- Sensors and alarms: They can be placed on doors and windows to alert homeowners and authorities if someone tries to enter their home or property without permission. These systems can also be set up to trigger automatic alerts to homeowners' smartphones or other devices.

- Neighborhood watch apps: Using apps explicitly designed for neighbors to stay connected and share information about suspicious activity. These apps can also be used to alert each other and local law enforcement in case of an emergency.
- Electronic access control: Neighborhoods can use electronic access control systems to restrict access to common areas such as pools, playgrounds, and community centers. These systems can prevent unauthorized individuals from entering, causing harm, or committing crimes.
- Virtual neighborhood patrols: With the help of technology such as drones and smart cameras, virtual neighborhood patrols can be set up to monitor the neighborhood 24/7. These provide an added layer of security.

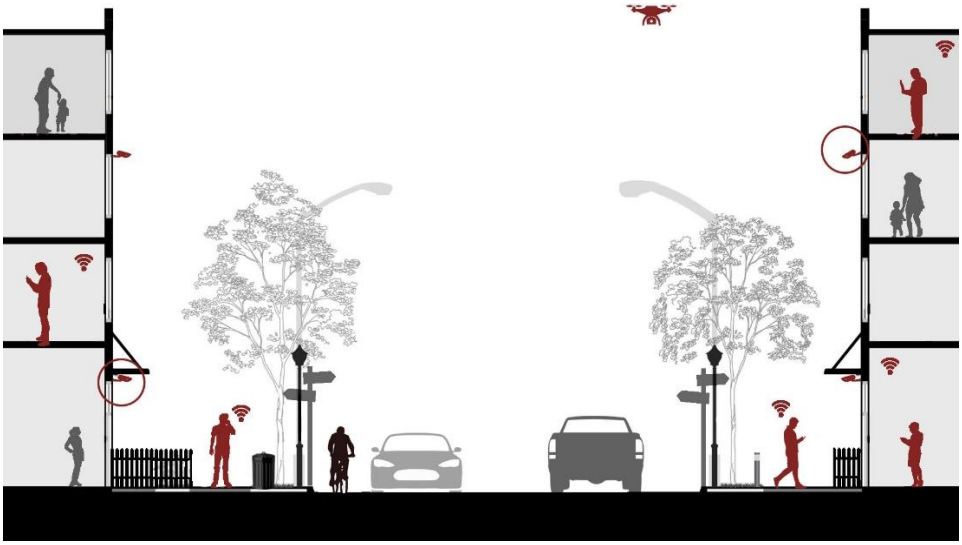


Figure 4. 20 Electronic safety Representation

9.Gates and Fences:

Gates and fences are helpful in preventing crime in residential areas by regulating access and establishing physical barriers, according to a National Institute of Justice analysis. For effective

security, the research emphasizes the significance of material selection, height and design, gate placement, gate control methods, and visibility.

In another study published in the Journal of Planning Education and Research, researchers found that the placement of gates and fences, along with other physical design features, can create a perception of territoriality and ownership, resulting in reduced crime rates in neighborhoods.

4.7 CRIME IN THE CITY OF DALLAS

Crime statistics look at the number of crimes committed in Dallas. The total number of crimes is obtained as an Excel spreadsheet from the City of Dallas Open portal. The data was then adjusted, combined, and trimmed around the urban park to find the hotspots. Each urban park with a hotspot nearby was researched independently, and then all were studied together. Understanding the number of criminal events is critical for determining targeted locations for crime prevention and the overall process of this research. Between January 2022 and December 2022, 135,517 criminal activities were gathered from the City of Dallas Open portal online records. Figure 4.21 shows the major criminal typologies (according to the open data portal) in the City of Dallas.

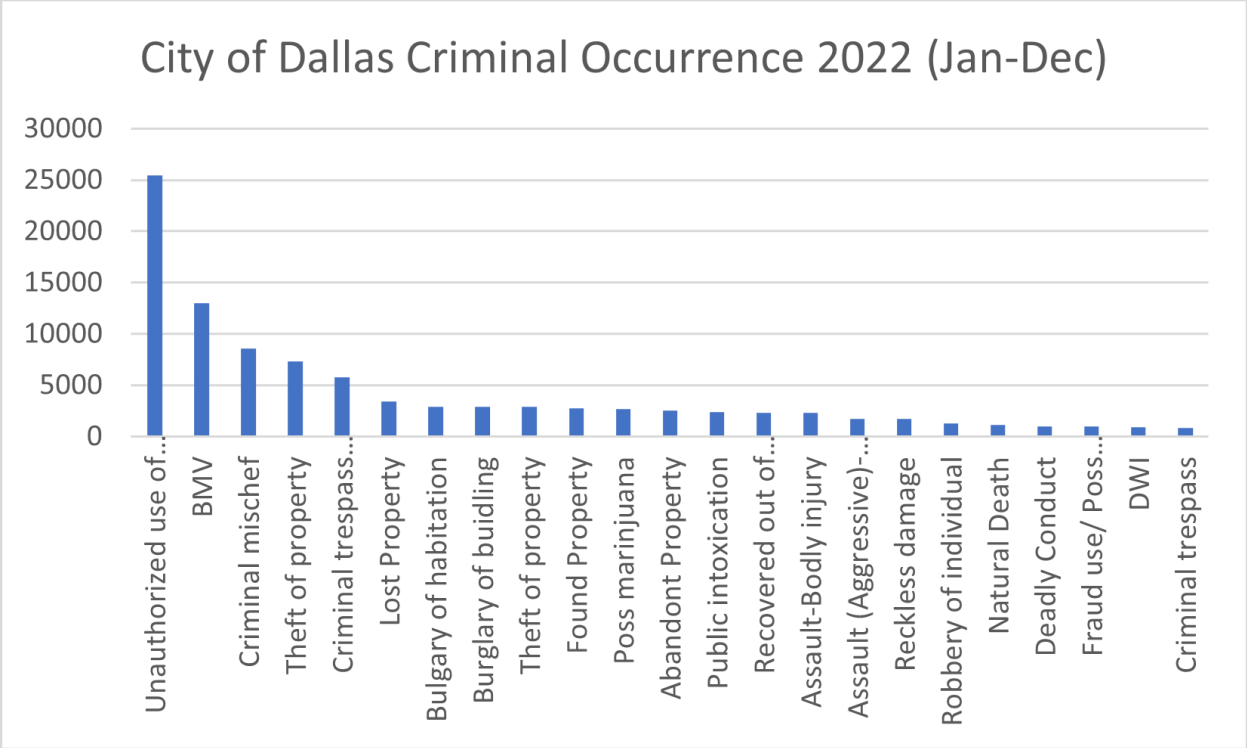


Figure 4. 21 Crime occurrence in the City of Dallas

As seen in Figure 4.21 above, the two most common criminal actions in Dallas are (1) unauthorized use of a motor vehicle (25471 recorded events) and (2) criminal mischief (8564 reported incidents). In this study, unlawful use of a motor vehicle is of particular interest due to the emphasis on geographical contextual factors contributing to criminal events. The map below depicts each geographical crime in the city of Dallas.

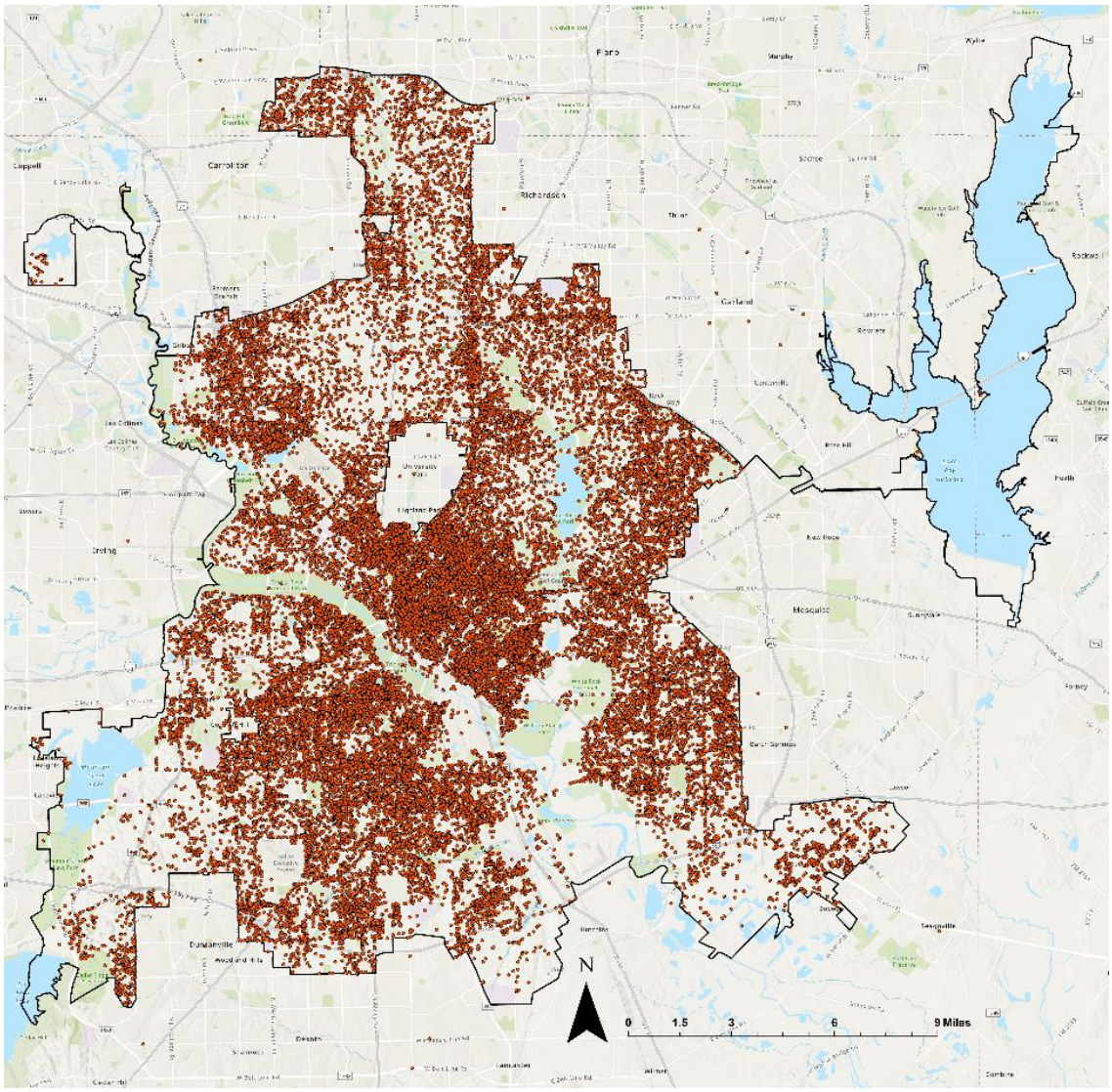


Figure 4. 22 Crime spot data within the City of Dallas

4.7.1 CRIME IN AND AROUND URBAN PARK IN DALLAS

This research revealed that most location statistics reported by Dallas Police Department was on street and intersections. Thus, geospatial data coded mostly illustrated such locations. However, when converted as geospatial point data, all the point data is happening on the periphery of the urban parks. This can be considered as a limitation on the point data available from the open data portal.

4.7.2 HOTSPOT ANALYSIS AND FINDINGS

The given point data is then translated using the application in ArcGIS, called optimal hotspot analysis. It helps in locating hotspots throughout the region. ArcGIS software is used to create a square polygon fishnet with dimensions of 1500’ feet by 1500’ feet formed to evaluate the hotspots in the City of Dallas.

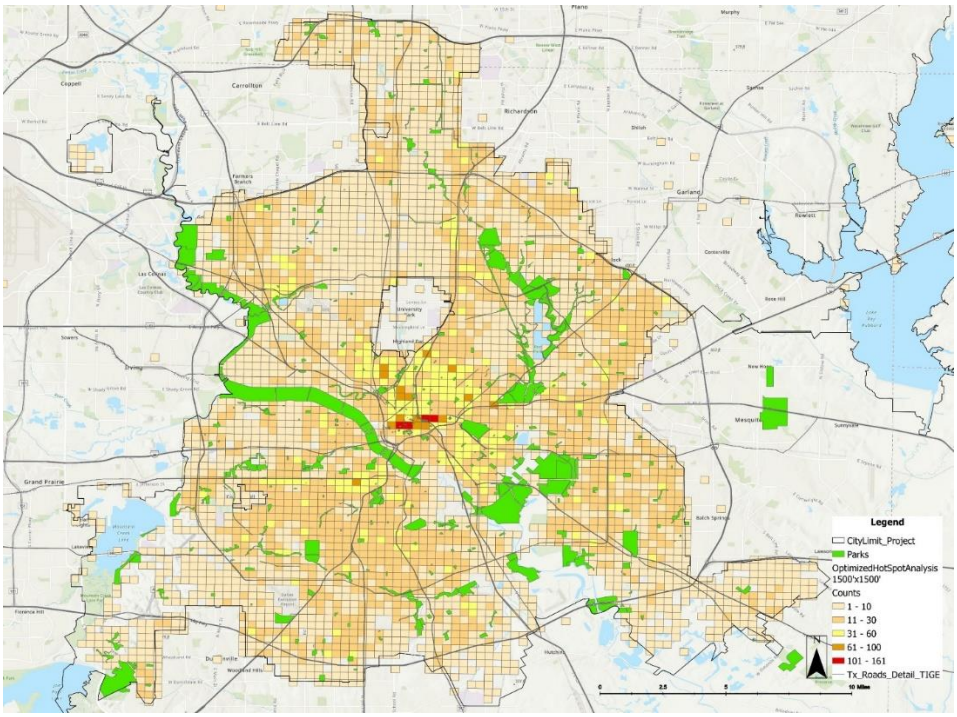


Figure 4. 23 Optimized Hotspot Analysis with 1500’x1500’ Square Polygon Fishnets

Figure 4.23 shows the square polygon fishnet created for the City of Dallas with hotspots located. Red shows the area with the highest number of crime incidents from 101-161 counts. Darker orange shows the crime ranging from 61-100. These two categories are majorly chosen for further study.

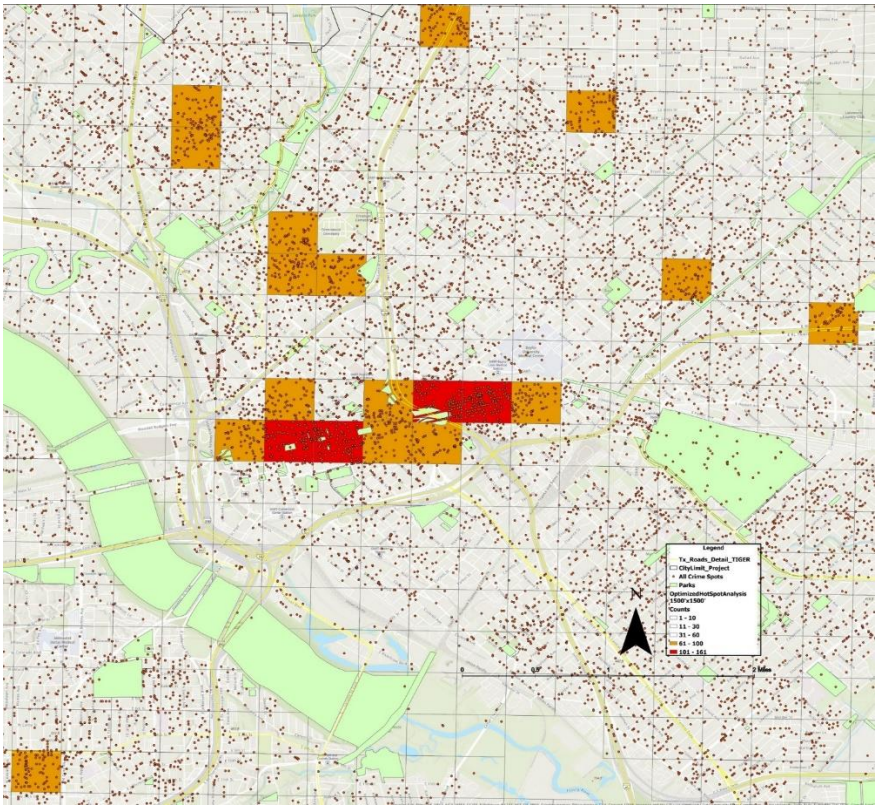


Figure 4. 24 Hotspots chosen with 1500'x1500' square polygon fishnet with point crime spots.

Figure 4.24 depicts a zoomed-in area of the two categories of hotspots considered for this study in the City of Dallas, including crime locations. Four primary hotspots and sixteen secondary hotspots are shown according to ArcGIS-optimized hotspot analysis. Seventeen urban parks associated with this twenty-hotspot optimized 1500'x1500' square polygon fishnets are identified. The table below shows the list of urban parks related to the hotspots within the City of Dallas.

Sl.No	Park Name	Open Park	HotSpot(Crime Count)	Housing Density	Type Of Streets	Population Density
1	Main Street Garden	Yes	198	71-80	Street	10k+
2	Julius Schepps	Yes	173	71-80	US Highway 75	5k-10k
3	Pegasus Plaza	Yes	124	71-80	Street	10k+
4	Stone Place Mall	Yes	124	71-80	Street	10k+
5	Browder St. Mall	Yes	124	71-80	Street	10k+
6	Belo Garden	Yes	106	61-70	Street	5k-10k
7	Four Way Place Mall	Yes	106	61-70	Street	5k-10k
8	Griggs Park	Yes	73	81-100	US Highway 75	10k+
9	Samuell-Grand	Yes	67	81-100	State Highway 78	2k-5k
10	Akard	Yes	67	61-70	Street	5k-10k
11	Park View	Yes	67	81-100	Street	2k-5k
12	Dealey Park	Yes	67	61-70	Street	5k-10k
13	Carpenter Park	Yes	62	81-100	US Highway 75	5k-10k
14	Majestic Theatre	Yes	62	71-80	Street	10k+
15	Pacific Plaza	Yes	62	71-80	Street	10k+
16	Elm At Pearl	Yes	62	71-80	Street	10k+
17	Old East Dallas Work Yard Park	Yes	61	81-100	Street	

Table 4. 3 List of urban parks associated with the hotspots within the City of Dallas

Three significant urban parks with the highest density, land use pattern, number of crimes, and kind of roadway are picked for further site selection criteria from the 17 connected with hotspots. Julius Schepps Park, Griggs Park, and Carpenter Park are among them. All three parks and their neighborhoods are being examined closely for further investigation. The three parks have one thing in common: they are located directly adjacent to US Highway 75 near downtown Dallas.

Figure 4. 25 Three selected urban parks with Optimized Hotspot Analysis layer

Figure 4:25 shows the relation of all the three chosen sites with US Highway 75. All the three parks come with the proximity of hotspots. These sites are then provided with a .25-mile radius for better understanding of the neighborhood context.

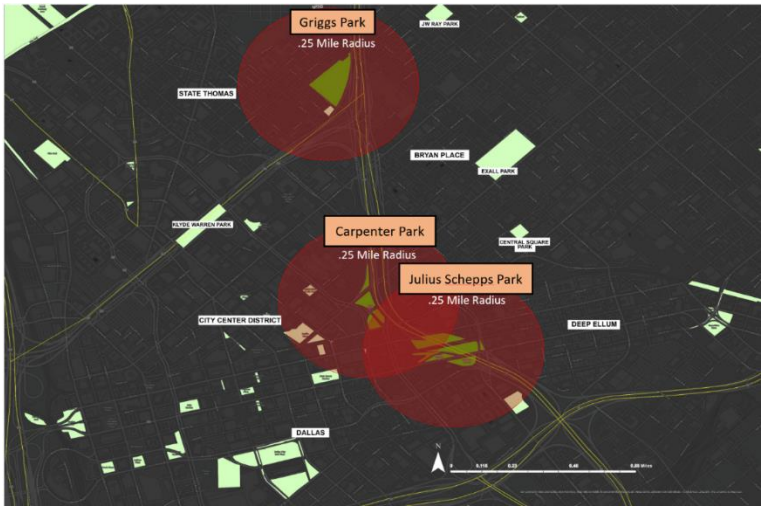


Figure 4. 26 Three selected sites by hotpots with .25-mile radius

Land use pattern is studied closely for a better understating of the sites. Griggs Parks lies near the State Thomas neighborhood, with a population density of 17,761 per square mile. (City Data, 2022). This neighborhood was the first designed in the City of Dallas based on the new urbanist concepts in the 1980s.

Carpenter Park lies on the eastern outskirts of Downtown Dallas, near Deep Ellum and East Dallas. With nearly 6 acres, it has become the largest park in the urban center since its opening on May 3, 2022 (Dallas Parks). It is associated with the greater proximity of transit as land use.

Julius Schepps is a 1.5-acre special-use park established in 1975 (Dallas Parks, 2023). Julius Schepps's immediate land use pattern is commercial. Julius Schepps Park is located beneath I-75, parallel to Commerce and Main Streets next to Downtown Dallas. Out of all the three parks, Griggs Park associated with State Thomas neighborhood was chosen for this study based on criteria including land use, population density, circulation, site visits etc.

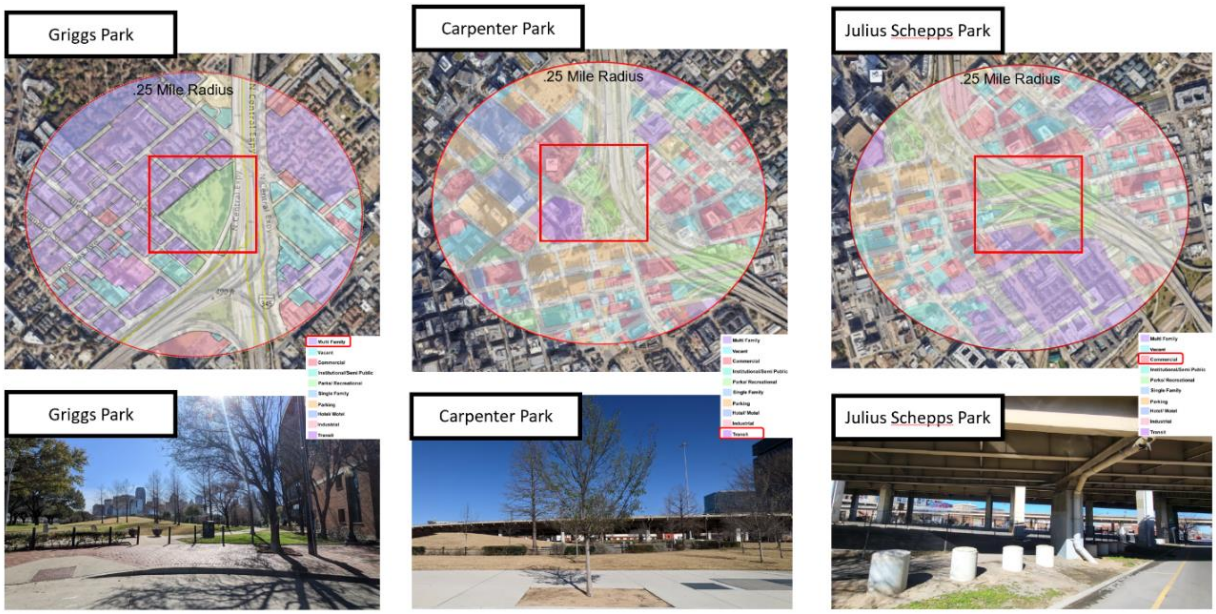


Figure 4. 27 - Land use and site images for all the three selected sites

Figure 4. 28 Griggs Park location map with site image

4.7.3 CRIME IN STATE THOMAS DISTRICT

Griggs Park belongs to the State Thomas neighborhood. State Thomas Neighborhood is considered to be one of the first new urbanist development/neighborhood redesigned within the Uptown District of the City of Dallas.

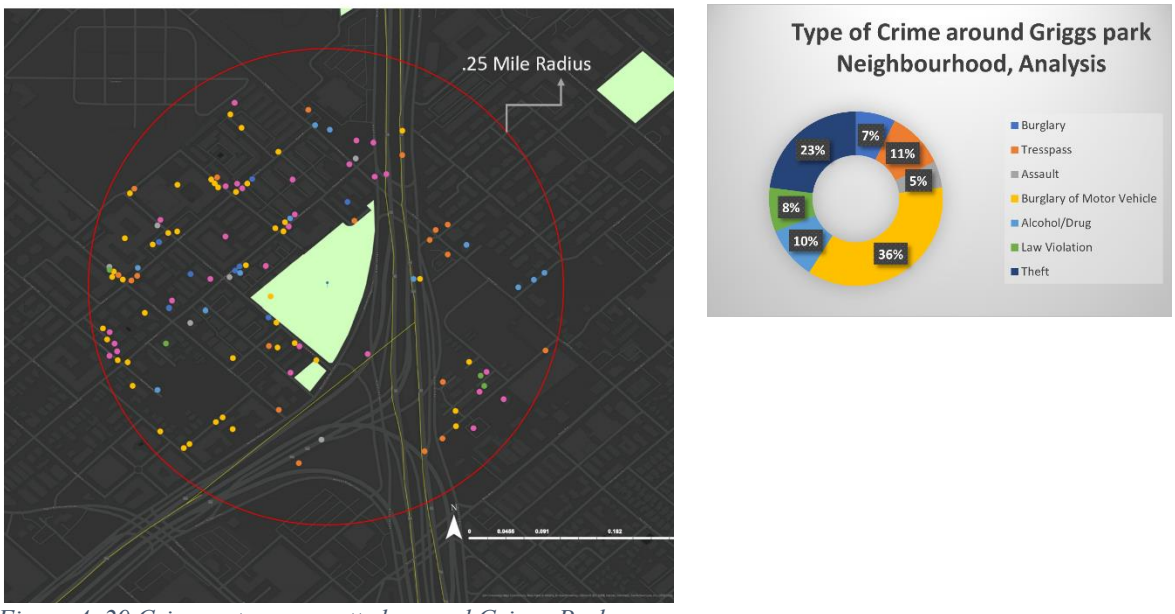


Figure 4. 29 Crime category spotted around Griggs Park

For a better understanding, a .25-mile radius has been provided around the park for better study. Within the .25-mile radius, it consisted of 123 criminal activities between January 2022 and December 2022. The crime category that has been

there in the open data portal was categorized for a better understating for this study purpose. Figure 4.29 shows all the crime spots with crime categories around Griggs Park within the .25-mile radius.

Figure: 4.29 also shows that none of the offenses occurred inside Griggs Park. The majority of the offenses were observed on the park's outskirts. The most common type of crime in the area is vehicle burglary and burglary of the property. As a part of the analysis, it is evident that crime clusters are there on the interconnections of the roads and the pedestrian. The relationship between these crimes and the park has to be taken closer through site analysis by overlaying circulation, land use, and green and open space map with the crime clusters.

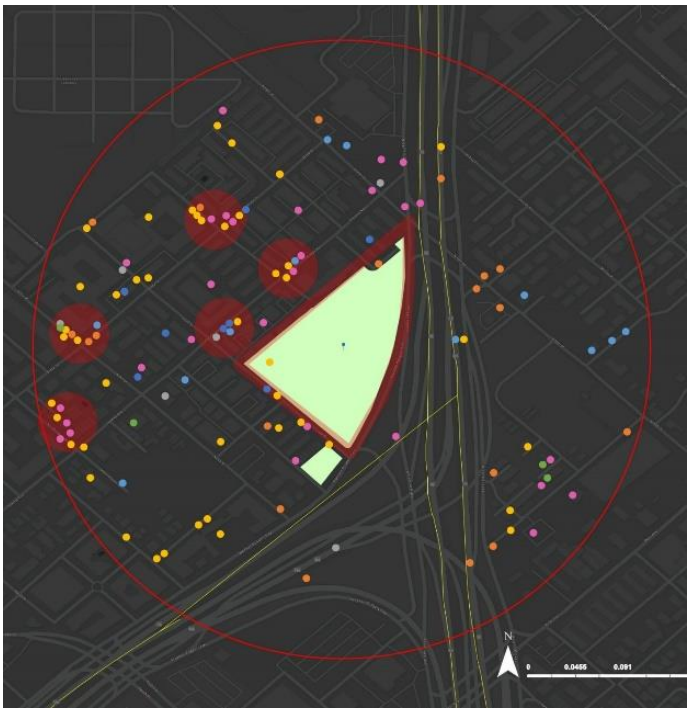


Figure 4. 30 Crime clusters

Figure 4.30 depicts the detection of criminal clusters inside the chosen locale. Using street view to take a closer look at the streets can help us figure out what is going on which is discussed in Chapter-5 as part of site analysis.

4.8 SYNTHESIS OF ANALYSIS AND FINDINGS

This research reported on data from four sources. First, the crime data is collected from the City of Dallas Open Data 2022 (Dallas Open Data, 2022). Then, Geographic Information Systems (GIS) is utilized for crime mapping based on the collected data to pinpoint hotspots in and around the urban parks in the city. Thirdly, the CPTED principles along with other relevant literature are documented to inform design strategies. A set of critical case studies are also adopted and analyzed.

The three of the other critical hotspot concentration were next I-75 corridor near downtown where there was a concentration of mixed uses as well as residential neighborhoods. Although a majority of the point data is beyond the boundaries of the park (potential data limitation). Grigg's Park and State Thomas neighborhood showed the density, and the potential to insert design strategies and principles to prevent criminal activity through design to impact. Analyzing the type of crime is critical in this research to responding to the type of design strategy. Burglary of automotive theft and property is the most common type of crime in the specified location.

4.9 SUMMARY AND FINDINGS

This chapter reported on the analysis and findings from the research. The chapter examined and synthesis case study and secondary data collected through GIS analysis. This chapter also assists in getting a better understanding of how similar professional projects are designed through case

studies. Analyzing and synthesis of case studies helped to come up with principles which suggest better design elements for this research and future use.

Site selection procedure was initiated in this chapter through secondary data analysis. Analyzing the data with the help of GIS helped to finalize the site for further research. This chapter also talks about the type of crime and crime clusters within the chosen site and chapter 5 will be discussing the design response based on the data derived through analysis and findings.

CHAPTER-5

DESIGN AND PLANNING

5.1 INTRODUCTION

This chapter discusses the design proposal for the chosen site, which is located next to Griggs Park in the State Thomas Neighborhood of Uptown Dallas. The chapter looks deeper into the site's history, inventory, and analysis, before applying CPTED principles along with the strategies developed in Chapter 4. Design proposals are developed for specific locations that require improved safety measures in terms of design. The design features are implemented in response to the crime typology occurring in each location on the site.

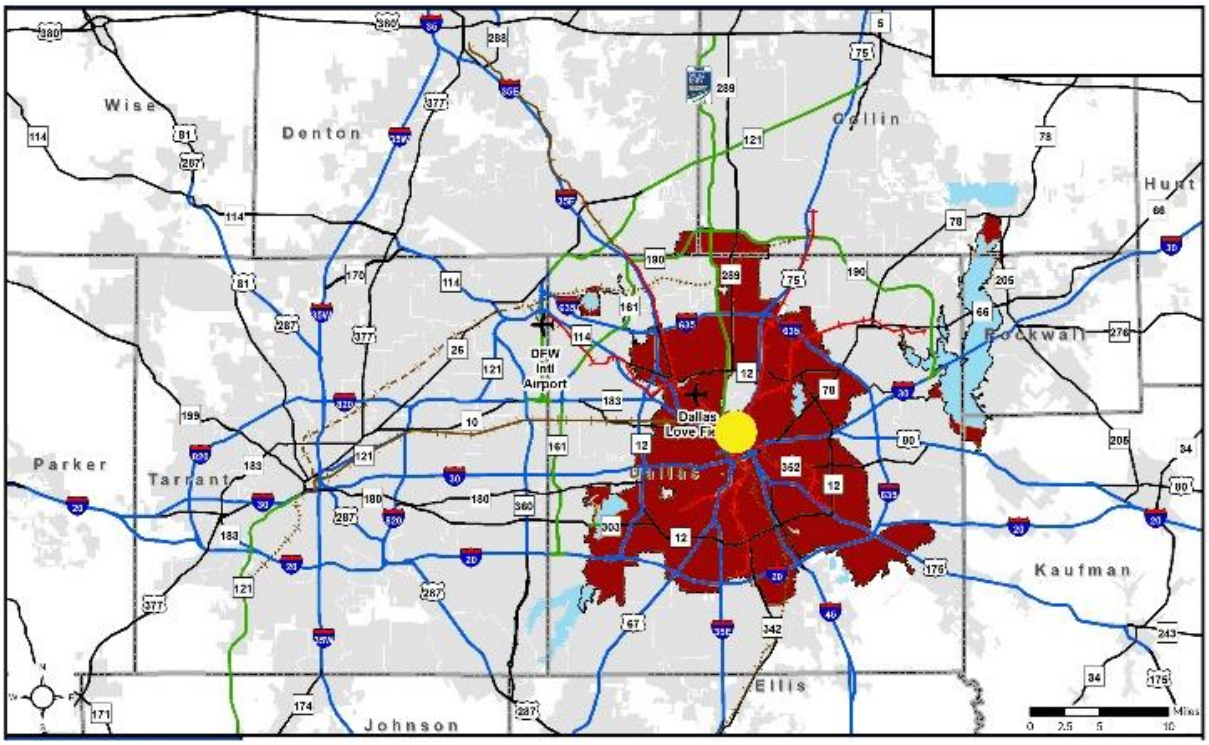


Figure 5. 1 Regional Map (Source: Dallas Economic Development)

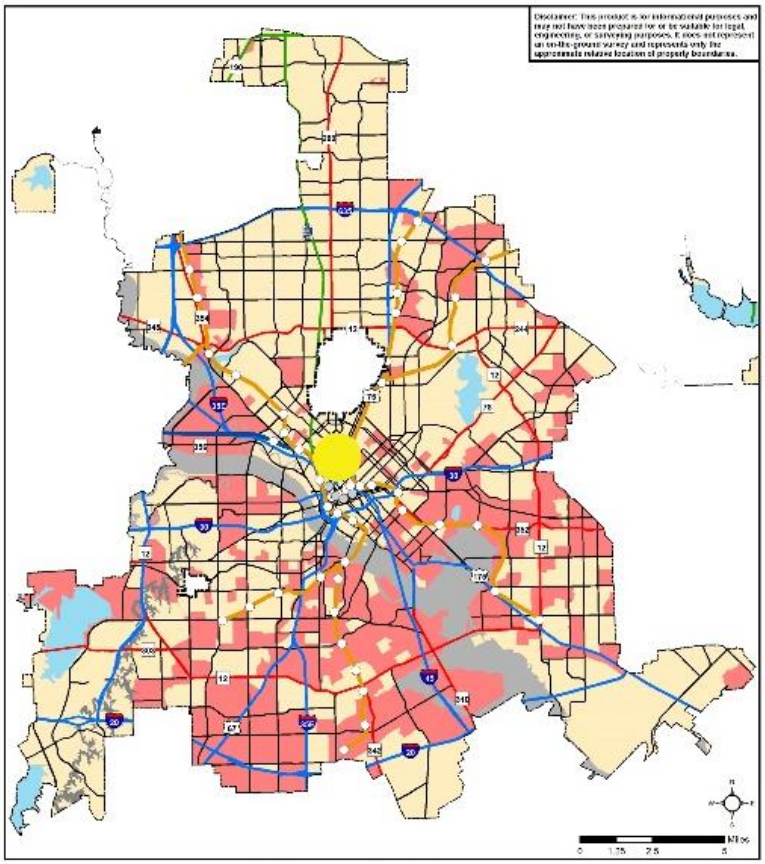


Figure 5. 2 City Map (Source: Dallas Economic Development)

Figure 5. 3 Study Area

5.2 SITE INVENTORY AND ANALYSIS

- Circulation:

Figure 5. 4 Circulation Map

I-75 is the main access to Griggs Park. Study area within .25-mile radius consist of Minor arterial, secondary and private roads. The neighborhood circulation follows grid pattern for connectivity.

- Green and Open space:

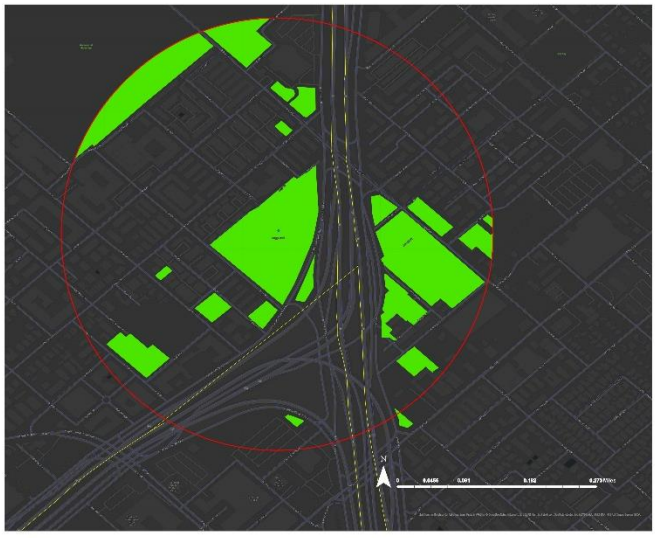


Figure 5. 5 Green and Open space

Griggs Park is in close proximity to Greenwood cemetery. Parallel to Griggs park, a vacant green space is present. There are vacant lots within the chosen study area.

- Land-Use

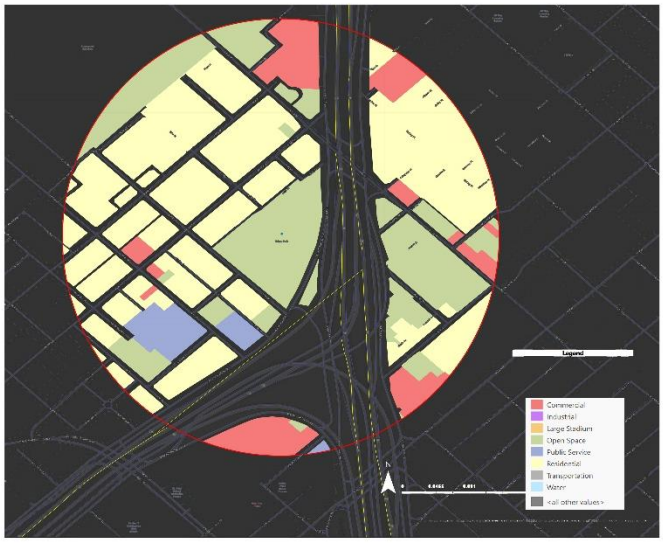


Figure 5. 6 Land use Map

High density of residential users. Poor connection between the cemetery and the Griggs park.

5.3 SITE SELECTION AND DESIGNING

Griggs Park's and State Thomas Neighborhood were chosen based on the analysis, as mentioned in Chapter 4. Figure 5.7 depicts the region that has been selected with the crime spotted. Now, based on the crime cluster, we decide which specific locations we need to respond to in order to increase safety and security through design.

Figure 5. 7 Site area with crime spots

The map above depicts selected sites based on crime concentrations. The locations picked are Thomas Ave, an intersection on Thomas Ave, and Clyde St. The site analysis and inventory section explore deeper into the activity that is going on in each location.

5.4 HISTORY OF SATE THOMAS NEIGHBORHOOD ANG GRIGGS PARK

Neighborhood History: The State-Thomas neighborhood is a historic Dallas' Uptown neighborhood district. State Street and Thomas Avenue are its two main thoroughfares. The

community was originally established as a residential neighborhood in the late nineteenth and early twentieth centuries (Uptown Dallas Breaks Ground on Griggs Park Improvements, 2013).

The State-Thomas neighborhood was a combination of farms and tiny houses in the late 1800s (d-magazine, 2016). However, the community became more appealing to the city's expanding middle and upper classes as Dallas grew. Many homes constructed during this period were large, ornate mansions designed in various styles such as Victorian, Italianate, and Craftsman. Throughout the first half of the twentieth century, the neighborhood thrived. By the 1960s and 1970s, however, many homes had deteriorated, and the community had become degraded (SWA). A redevelopment project was launched in the 1980s to return the neighborhood to its former glory.

The State-Thomas neighborhood is now a vibrant and upscale neighborhood with various stores, restaurants, and businesses. The region is designated on the National Register of Historic Places, and many of the old residences have been restored and conserved. The neighborhood has also become a popular destination because of its architecture and inspiring streetscapes.

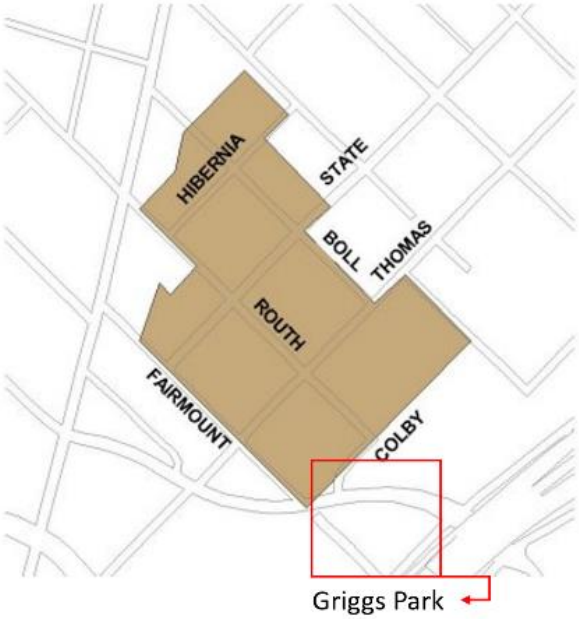


Figure 5. 8 Map from 1986 which shows State Thomas Neighborhood and Griggs Park (Source: Uptown Dallas Breaks Ground on Griggs Park Improvements, 2013)

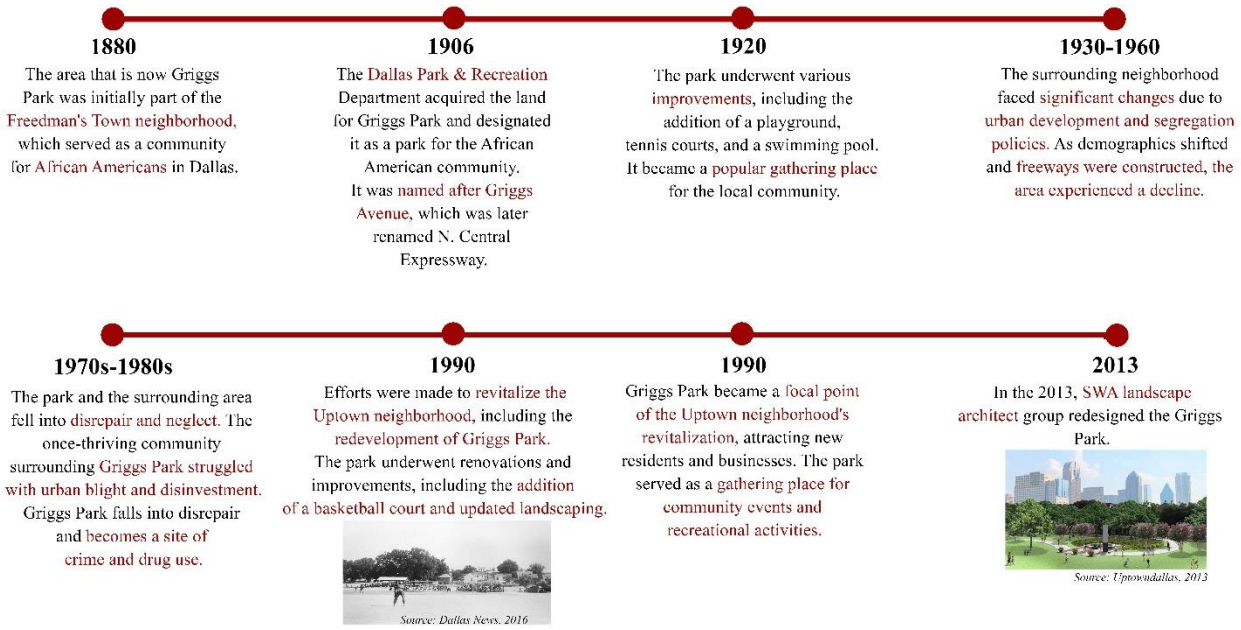


Figure 5. 9 Historic Time lime of Griggs Park

5.5 SELECTED SITE: INVENTORY AND ANALYSIS

Three sites have been selected based on crime cluster, closer proximity to the park, and typology of locations. The first location is Clyde St, part of the secondary road. This street is not designed, and the number of people that use the street is significantly less. Due to the lack of street usage, it has crimes such as property theft, trespass, and alcohol/ drug.

The second location that has been selected is an intersection of Thomas Ave, and Clark St. This site has a cluster of crimes such as theft of property, assault, burglary, alcohol/ drug, and burglary of the motor vehicle. Activating space can reduce the crime rate, resulting in more people using the space.

The third location chosen is Thomas St. which has residential on both sides of the street. Unfortunately, this street has overgrown trees, which affects visibility.

Site inventory and analysis takes a closer look at what exactly is happening on the locations.

Location-1 #Clyde St

Type of crime: Theft of property, trespass, alcohol/ drug

Type of Road: Secondary Road

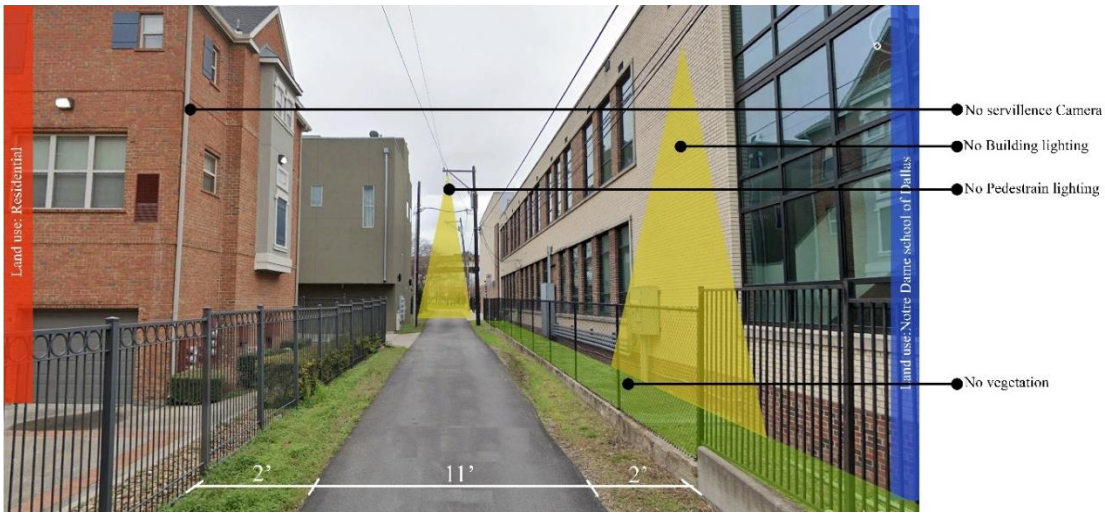


Figure 5. 10 Clyde St analysis

Location- 2 #Intersection at Thomas Ave and Clark St

Type of crime: Theft of property, assault, burglary, alcohol/ drug, burglary of motor vehicle

Type of Road: Minor Arterial

Figure 5. 11 Intersection at Thomas Ave and Clark Street analysis

Location- 3 # Thomas Ave

Type of crime: Burglary of Motor vehicle, theft, alcohol/ drug

Type of road: Minor Arterial

Figure 5. 12 Thomas Ave analysis

5.6 DESIGN

To design the spaces, three of the crime-clustered spots were chosen to show how the design strategies can be applied in terms of achieving safety and security. An intersection, a minor arterial road, and a secondary road have been chosen. The design response results from a site inventory analysis to determine why these areas have such high crime rates. Design primarily talks about:

Natural surveillance is a concern in the State Thomas neighborhood. Most of the roads are overgrown with trees, which block the balconies and windows. As a result, the design emphasizes having fewer trees or preserving the height and width of the tree spread for greater aesthetic quality. The view is obstructed by parking on both sides. As a result, the visual quality in the State Thomas neighborhood could be better. The design idea includes parking on one side. All of the building's environs have hedge gaps to prevent pedestrian access individuals from drawing graffiti.

Uniformed lighting has been provided separately for streets and pedestrians.

Location-1 #Clyde St

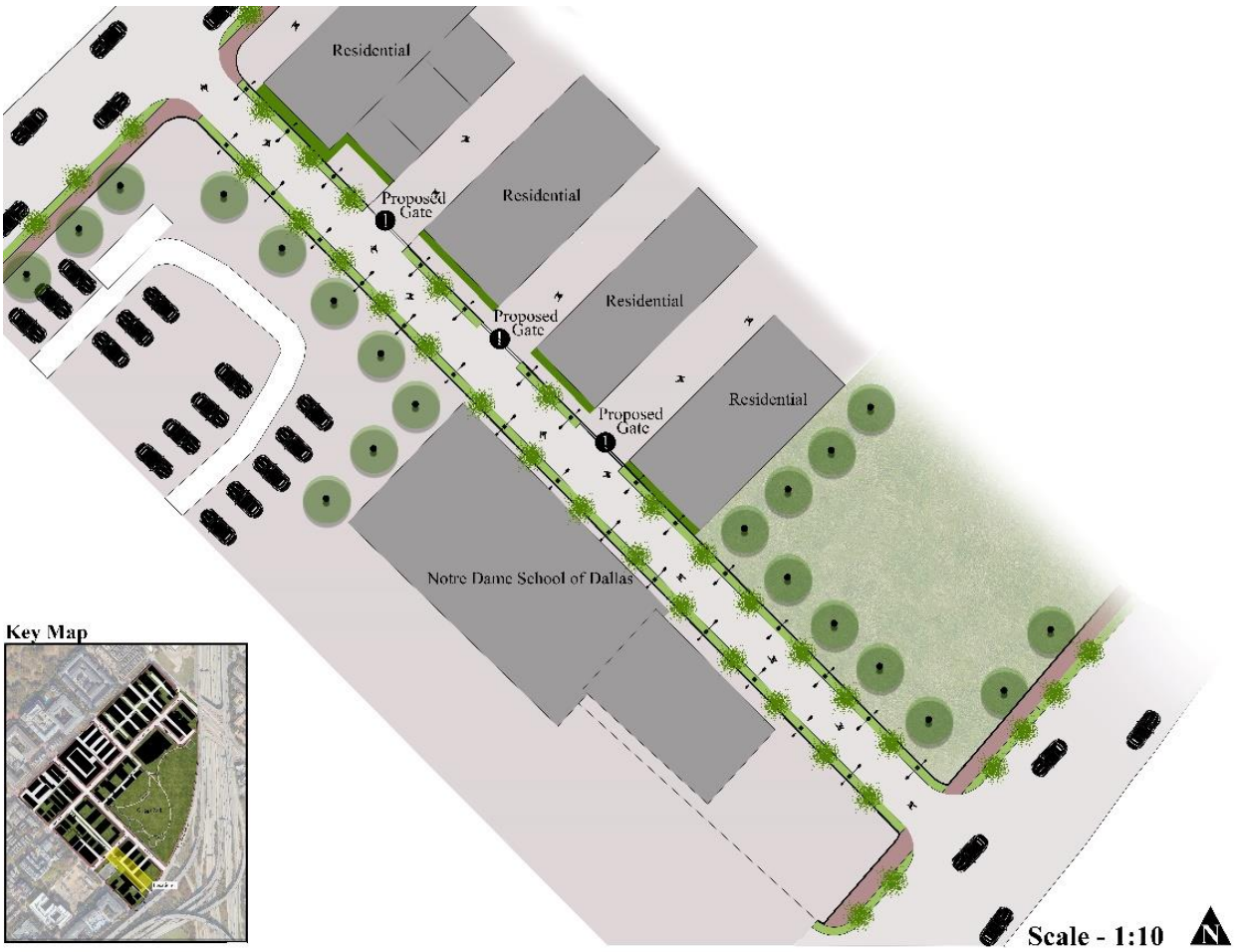


Figure 5. 13 Plan for Clyde Street

About the site: Clyde Street comes under the category of secondary road. The road has two different land uses parallel to each other. Residents exclusively use this road to get their cars to their homes. Crimes like alcohol/drug happens in this street due to the lack of lighting. Theft and trespassing on this street may be related to the same problem. This street has no vegetation at all. There is no restriction on access as well.

Design Initiative: Private gates were added to ensure safety from pedestrian users from outside. Since the Notre Dame School of Dallas and the residential block lie parallel to Clyde Street, adding gates brings a sense of separation from both the different land use. Constant vegetation on both the street sides with uniformed lighting was added to bring a sense of safer environment. Surveillance cameras are provided on each entry and exit point.

Location- 2 #Intersection at Thomas Ave and Clark St

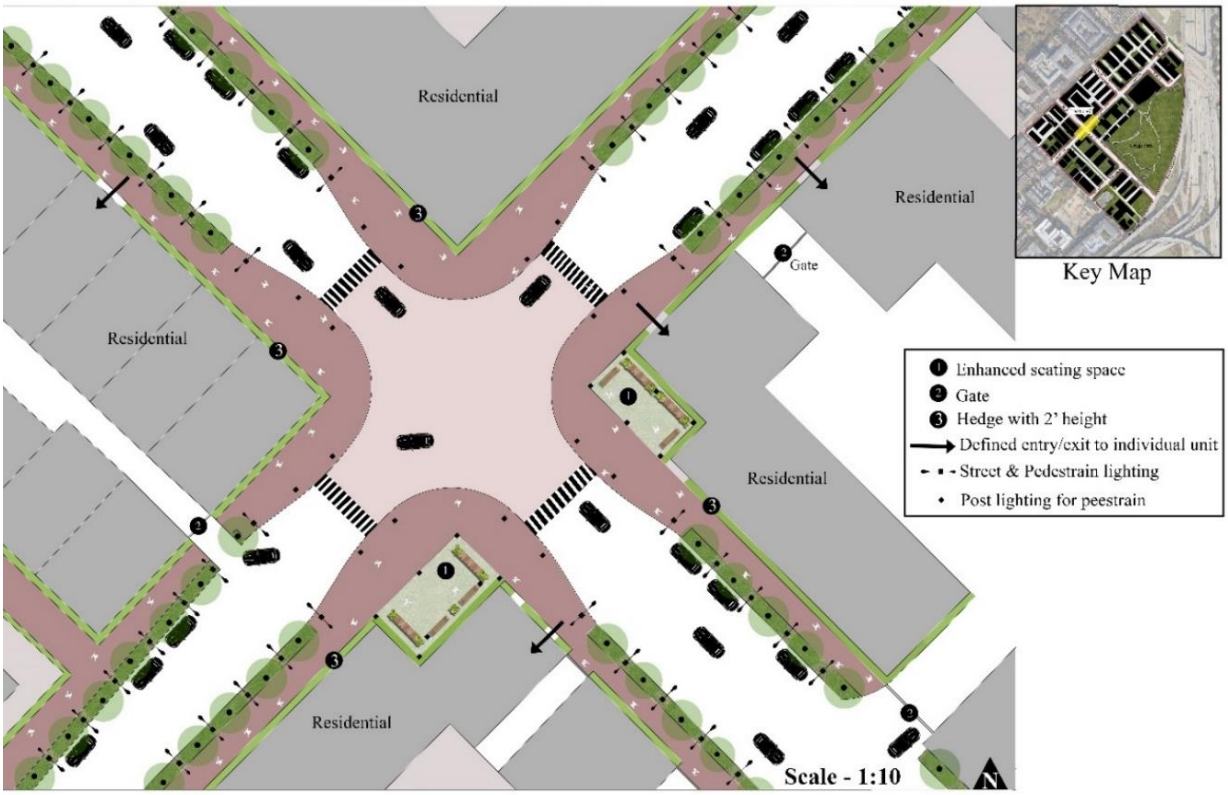


Figure 5. 14 Plan for the Thomas Ave Clark Street intersection

About the site: The intersection of Thomas Avenue and Clark Street is classified as a minor arterial road. This the intersection was a hotspot for property theft, assault, burglary, alcohol/drug use, and motor vehicle burglary. This crossroads is surrounded by residential buildings. There were two

corners adjacent to the intersection that were not used but had vegetation. It may or may not be the cause of the crime event. There was minimal lighting and poor signage at intersections as well.

Design Inititative: The main design concept used here was to activate the corner area with seating and additional lighting. Initially, the spot was not used and was merely surrounded by hedges. By activating this corner area, the pedestrian may actually use it. Seating with lights is the greatest option, especially considering this is a residential area. It can serve as a meeting place for both outsiders and residents of the community.

Location- 3 # Thomas Ave

Figure 5. 15 Plan for Thomas Ave

About the site: Thomas Avenue is a minor arterial road. The most common crimes in this area are motor vehicle burglary, theft, and drug use. The site includes overgrown trees that were not well

managed, and it is possible that this is why this space has become a hotspot. One of the reasons this space became a hotspot could be a lack of private gates. This region is in desperate need of upkeep and improved visual appeal.

Design Initiative:

Tress has to be maintained or replanted. Hedges are provided throughout the surroundings of the building to deny access from pedestrians. Lighting separately for the street and for pedestrians is provided. Surveillance cameras are provided on each entry and exit point. Parking on both sides must be removed, and consideration should be given to parking just on one side in order to achieve natural surveillance.

5.7 DESIGN DETAILS

Design details show three-dimensional renderings of how the selected site should assure safety and security. All design components used in this design are from the eight CPTED principles. The pedestrian already had lighting; however, the objective of the lighting was not met due to overgrown trees. Therefore, separate lighting for pedestrians and streets is provided. Trimming trees and reducing the number of trees are suggested to ensure visibility from windows and balconies. All entry/exit points have been focused on ensuring they are visible, and electronic access gates are only for residents. Parking on both sides of the road has been removed to improve visibility.

Location-1 #Clyde St

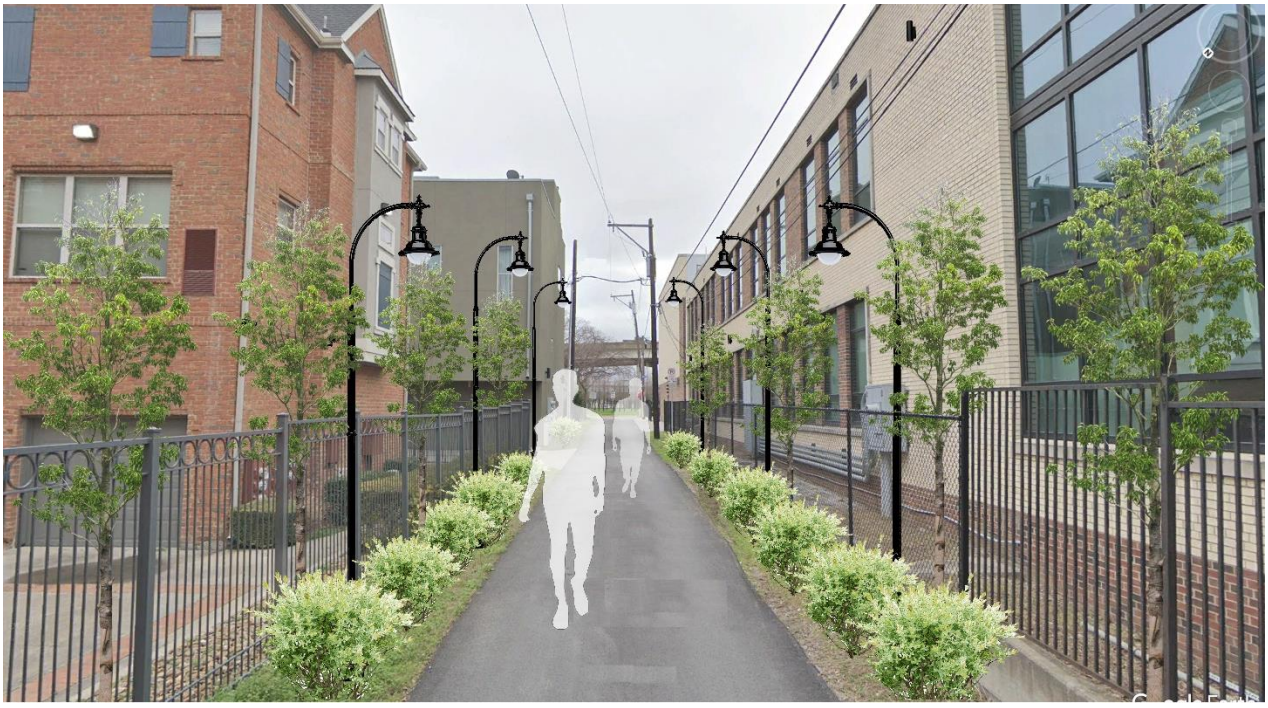


Figure 5. 16 Clyde St

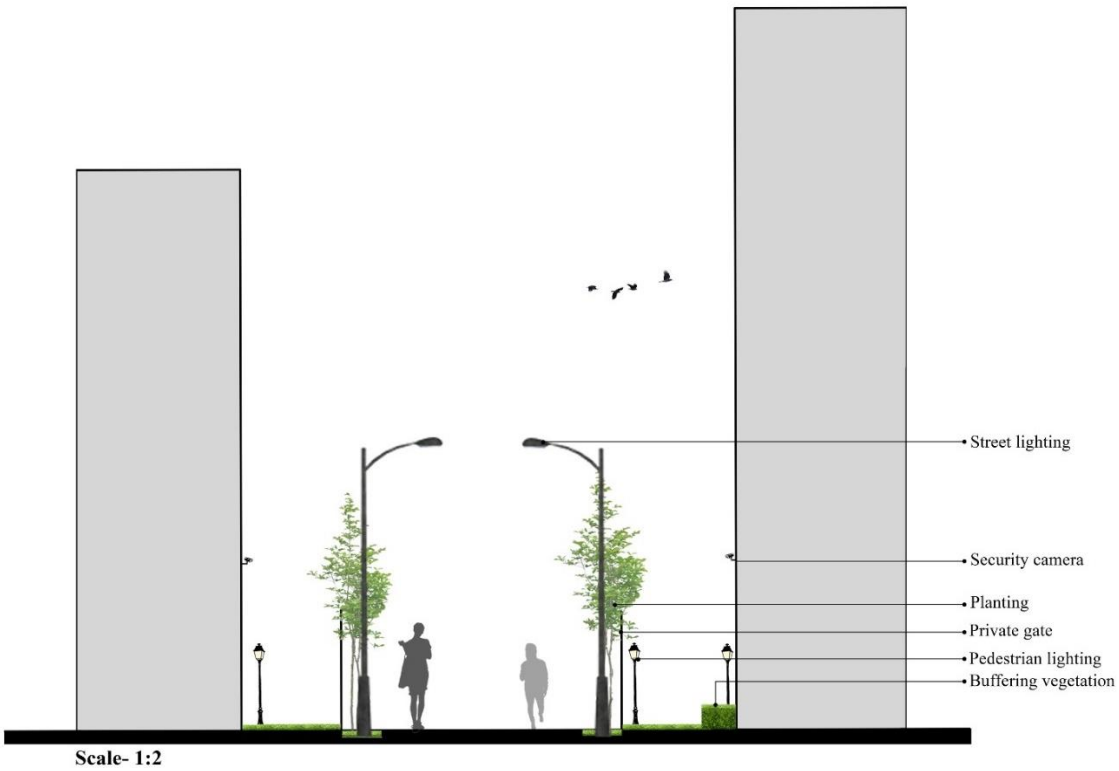


Figure 5. 17 Section of Clyde St Proposal

Location- 2 #Intersection at Thomas Ave and Clark St

Figure 5. 18 Before the design proposal of the Intersection

Figure 5. 19 After Design Proposal of the Intersection

Location- 3 # Thomas Ave

Figure 5. 20 Thomas St Proposal

Figure 5. 21 Section of the Thomas Ave

5.8 PLANNING AND DESIGN SUMMARY

In summary, this chapter discusses the data synthesis from Chapter 4, which are the site selection criteria and suggested design strategies for achieving safety and security. This chapter also highlights the site analysis done for Griggs Park and the State Thomas Neighborhood within Uptown Dallas, illustrating the hotspots, land use, circulation street quality, and so on. This information is provided to help guide how the suggested design criteria are incorporated and applied to the site. In addition, a proposed concept and design are also addressed.

CHAPTER-6

CONCLUSION

6.1 INTRODUCTION

The research was to understand and redesign the environment that contributes to crime by examining where crime and criminal activities occur in and around urban parks in the city of Dallas. After a series of geospatial distribution investigation of crime from the city of Dallas DPT reports, the study focused on hotspots near urban parks within the city limits. The research focused specifically on the analysis, and redesign of State Thomas Neighborhood due to the documented crime hotspots surrounding Griggs Parks. The research used CPTED principles and other relevant design literature. The goal was to provide an evidence-based approach on the assessment and redesign of urban parks and their surroundings to address safety.

The study revealed that evidence-based design strategies can enhance the safety in urban parks and their environments and provide safe and secure neighborhoods for people to enjoy starting from State Thomas neighborhood. It is also critically examined that CPTED can be a successful strategy for reducing crime and improving community safety. Designers, planners and developers with the help of landscape architects can build surroundings that discourage criminal activity and encourage social unity by constructing neighborhoods with CPTED concepts in mind. Neighborhood development based on CPTED can be an important tool for generating safer and more vibrant neighborhoods. However, it is important to note that CPTED by itself is not the solution for crime prevention. It needs to be improved over time with new data and evidence from case studies and scholarly research. To address the fundamental causes of crime and produce positive social results, CPTED must also be utilized in concert with other strategies such as community policing and social initiatives.

6.2 RESEARCH QUESTIONS REVISITIED

1. What type of crimes do occur and where in and around urban parks in the City of Dallas?

This research revealed that the most common type of crime in Dallas is violent crime, which includes homicide, robbery, assault, and burglary for the study period under investigation. The research also shows that their high rate in violent crime in the month of April-June.

The geospatial coding and hotspot analysis illustrated that the types of crime that occur in Dallas seem to be the unauthorized use of motor vehicles. According to GIS study, almost all the crime data (geolocations) geocoded in this study were located outside of parks. There were very few incidents & geocodes that showed a crime that occurred in the park. Although this sounds promising for urban parks this is later deemed that geocoding locations from police reports may have secondary data and locational limitations. Because of the surrounding safety concerns, individuals may use or access to parks and their vicinity on a limited basis. So, it is critical improve environmental conditions surrounding parks.

2. What are the environmental variables and features that effects crime in and around parks?

Literature review prevailed multiple environmental variables and features that have been associated with crime and criminal activity which are listed in Chapter-4. The findings from the research Griggs parks and State Thomas neighborhood had variety of environmental variables and features that may contribute to crime are:

Lighting: Poor lighting can make it easier for criminals to conduct crimes by making it difficult for people to notice what is going on. In general, well-lit parks are safer than poorly lit parks.

Visibility: Visibility is one of the major concerns, especially if the street has overgrown trees which are not maintained. Criminals are less likely to conduct crimes if they are aware that others can see them.

Park amenities: Parks with many amenities, such as playgrounds, sports fields, and picnic spots, tend to draw more people, which can minimize crime. Underutilized areas, on the other hand, may be more prone to criminal activity.

Maintenance: Well-kept parks and streets are safer than badly maintained areas because they attract more people and foster a sense of community ownership.

Police presence: The presence of police personnel in and near parks might discourage criminal activity and make people feel safer.

3. What design improvements can be made to improve environmental conditions surrounding the crime hotspots in and around Griggs Parks in the State Thomas neighborhood of Dallas, Texas?

The study of the Griggs Parks and its context within State Thomas neighborhood revealed that:

Increase lighting: Adding lights to areas can boost visibility and make it more difficult to operate undetected.

Trim vegetation: overgrown vegetation can provide cover for criminals and criminal activity. Periodic upkeep and maintenance along with trimming back vegetation can increase visibility and make an area more open and pleasant.

Install surveillance cameras: Installing surveillance cameras in crime hotspots helps prevent criminal activity while also providing evidence if a crime does occur.

Increase police patrols: Increasing police patrols in and near crime hotspots can make it more difficult for criminals to operate and boost park users' perceptions of safety.

Increase signage: Adding signs warning park users to be mindful of their surroundings and report suspicious activities can inspire individuals to be more cautious and proactive in crime prevention.

Engage the community: Working with residents and community groups to identify and address crime hotspots may foster a sense of ownership and investment in the park, as well as inspire people to take an active role in crime prevention.

6.3 RELEVANCE TO LANDSCAPE ARCHITECTURE

Landscape architects design spaces that respond to crime and criminal activity to assure safe and secure physical environment. CPTED concepts, along with rigorous site level understanding, can be used by landscape architects to create outdoor places that inhibit criminal activities, and make residents feel safer. This can include using lighting, designing spaces to encourage natural surveillance, and using landscaping to create clear sightlines. Conducting site analyses and assessments to identify potential safety and security concerns in a neighborhood, and design solutions to address them. Analyzing traffic patterns, assessing the condition of sidewalks and other pedestrian infrastructure, and assessing the risk for criminality in certain places are all examples of what this includes.

Landscape architects can work with residents and community groups to better understand their wants, needs, and concerns, and then develop solutions to address those requirements. This may encourage a sense of ownership and investment in public places, leading to improved vigilance and reduced crime. Landscape architects may create natural play areas that are enjoyable and engaging for children while also allowing for natural surveillance by adults. It can create a sense

of community ownership and investment in the park and its surroundings, leading to enhanced vigilance and a reduction in crime. In conclusion, landscape architects may bring a variety of skills and knowledge to the design of outdoor spaces that can help improve parks and neighborhood safety and security.

6.4 DISCUSSION

This study focused on taking an in-depth look at the issue of crime and safety in relation to physical environment. The research was to understand and redesign the environment that contributes to crime by examining where crime and criminal activities occur in and around urban parks in the city of Dallas. The study revealed that parks may not always be the cause of crime, but the urban parks context might have a significant influence in the safety and security of public realm. This study primarily attempted to focus on current CPTED concepts while also discovering some more ways that are significant in bringing safety and security.

As cities become denser, there is a greater need to develop multi-functional outdoor spaces that can serve various functions, such as providing enjoyment, increasing biodiversity, and improving safety and security. Research could look into how landscape architects can design these areas to meet many goals at the same time. It is also the responsibility of landscape architects to develop outdoor environments that are equal and promote social justice. Future research could look into how CPTED strategies can be used to address social and economic inequalities in a community and promote safety and security for all residents, regardless of income or background.

6.5 FUTURE RESEARCH

Even though crime prevention through design and planning has been a growing subject in architectural industries in recent decades, crime research is not strongly established in design. It is essential for design professionals who shape the built environment daily to have a better

awareness of the topic and the duty to address such concerns. As a result, crime and crime prevention concerning the spatial environment provide prospects for future research for design professionals. Even while this study addresses several of the objectives, particularly concerning the park's surroundings in the city of Dallas, other issues still need to be addressed in this thesis that may lay the groundwork for future research. These topics may include but not limited to:

- How can implementing CPTED (Crime Prevention Through Environmental Design) be improved specifically for landscape architects in their profession?
- How can we effectively raise awareness about the importance of crime prevention strategies among the general public?
- How can safety and security considerations for crime prevention be effectively integrated into the design of pedestrian spaces to promote healthy community development?
- How can safety and security be effectively implemented as a default design strategy across various disciplines and industries?

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