



**FATİH SULTAN MEHMET VAKIF ÜNİVERSİTESİ
LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ
MİMARLIK ANABİLİM DALI
MİMARLIK İNGİLİZCE PROGRAMI**

**PERCEIVED NEIGHBORHOOD SAFETY IN THE
BUILT ENVIRONMENT: THE CASE OF AMMAN'S
BOULEVARD**

YÜKSEK LİSANS TEZİ

OMAR SHAMMOUT

İSTANBUL, 2024



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İSTANBUL, 2024

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LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ MÜDÜRLÜĞÜNE

Mimarlık Anabilim Dalı Mimarlık İngilizce tezli yüksek lisans programı öğrencisi 210202101 numaralı **Omar SHAMMOUT**'un, hazırladığı "*Crime Prevention Through Built Environment: The Case of Amman*" konulu yüksek lisans ile ilgili Tez Savunma Sınavı, 19.01.2024 Cuma günü saat 14:00'de yapılmış, sorulara alınan cevaplar sonunda adayın tezinin **Kabulüne Oy Birliği** ile karar verilmiştir.

Tez adı değişikliği yapılması halinde: Tez adının Perceived Neighborhood Safety in the Built Environment: The Case of Amman's Boulevard şeklinde değiştirilmesi uygundur.

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ETİK BİLDİRİM

Bu tezin yazılmasında bilimsel ahlak kurallarına uyulduğunu, başkalarının eserlerinden yararlanılması durumunda bilimsel normlara uygun olarak atıfta bulunulduğunu, kullanılan verilerde herhangi bir tahrifat yapılmadığını, tezin herhangi bir kısmının bağlı olduğum üniversite veya bir başka üniversitedeki başka bir çalışma olarak sunulmadığını beyan ederim.

Omar Shammout

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Omar Shammout

YAPILI ÇEVREDE ALGILANAN MAHALLE GÜVENLİĞİ: AMMAN BULVARI ÖRNEĞİ

Omar Shammout

ÖZET

Bu çalışmanın temel amacı, Ürdün'ün başkenti Amman'ın bir bölgesinde yapılı çevre ile bireylerin güvenlik hissi arasındaki ilişkiyi ve bu hissin kentsel sürdürülebilirlik ve kentsel dönüşümle nasıl ilişkili olduğunu araştırmaktır. Ayrıca, kentsel planlama ve iyi tasarlanmış kentsel alanların mahalle düzeyinde güvenlik hissini ve suç korkusunu nasıl etkilediğini araştırmaktır. Kentsel alanlarda suç azaltmak ve mahalle sakinlerinin güvenlik duygularını ölçmek için bir araç olarak çevresel tasarım yoluyla suç önleme (CPTED), mahallenin güvenlik duygusunu ve suç korkusunu ve bunların mahalleyi nasıl etkilediğini iyileştirmek için düşünülmüştür. Projeden sonra mahallede tanık olunan suç oranlarındaki artışa rağmen, sonuçlar insanların bulvar projesinin inşasından sonra, öncesine kıyasla kendilerini daha güvende hissettiklerini göstermiştir. Araştırmaya göre insanların kendilerini güvende hissetmelerinin başlıca nedenleri, bulvar projesinden sonra polisin yaygınlaşması ve bulvar projesinin inşasından sonra sunulan bakım ve iyi tasarlanmış sokaklardır. Çalışma, mahallede yaşayan kişiler tarafından cevaplanan bir anket kullanılarak nicel bir yöntemle yürütülmüştür. 96 Katılımcıdan mahalledeki güvenlik duygularını ve suç korkusunu ölçmek ve ayrıca insanların sosyal uyum ve topluluk katılımı konusundaki bakış açılarını anlamak ve bunu ikinci nesil CPTED ile ilişkilendirmek için 29 soruya yanıt toplanmıştır. Hem güvenlik hissi ve bunun yapılı çevre ile ilişkisi hem de Çevresel Tasarım Yoluyla Suç Önleme üzerine derinlemesine bir literatür taraması yapılmıştır. Bazı tahminler beklendiği gibiydi ve bulvar projesinden sonra insanlar kendilerini daha güvende hissettikleri için literatür taramasıyla uyumluydu, ancak bazıları beklenenin tam tersiydi, çünkü projenin üzerine inşa edildiği bazı evlerin yıkılmasından sonra sosyal uyumun azalacağına

inanılıyordu, ancak öyle olmadı ve bunun sakinlerin güvenlik hissi perspektiflerinin artmasının nedenlerinden biri olabileceğine inanılıyordu.

Anahtar Kelimeler: Güvenlik Hissi, Suç Korkusu, CPTED, Kentsel Sürdürülebilirlik, Yapılı Çevre, Algılanan Mahalle Güvenliği

PERCEIVED NEIGHBORHOOD SAFETY IN THE BUILT ENVIRONMENT: THE CASE OF AMMAN'S BOULEVARD

Omar Shammout

ABSTRACT

The main objective of this study was to investigate the relationship between the built environment and individuals' sense of safety and how this sense is related to urban sustainability and urban transformation in a district of Amman, Jordan. Also, to investigate how urban planning and well-designed urban areas affect feelings of safety and fear of crime at the neighborhood level. Crime prevention through environmental design (CPTED) as a tool to reduce crime in urban areas and measure residents' feelings of safety was considered to improve neighborhood sense of security and fear of crime and how they influence the neighborhood. Despite the increase in witnessed crime rates in the neighborhood after the project, results showed that people felt safer after the construction of the boulevard project compared to the period before it. The main reasons for people's feeling of safety according to the study were the wide spread of police after the boulevard project and the maintenance and the well-designed streets that were offered after the construction of the boulevard project as well. Contrary to expectations, when investigating the second generation of the CPTED that is related to social cohesion and community involvement, people felt that the social cohesion of the neighborhood was higher, and that also played a major role in their safety feeling. The study conducted a quantitative method using a questionnaire that was answered by people who live in the neighborhood. 96 Responses to 29 questions were collected to measure safety feelings and fear of crime in the neighborhood and also to understand people's perspectives on social cohesion and community involvement and connect it to second generation CPTED. An in-depth literature review was carried out on both safety feeling and its relationship with the built environment, and Crime Prevention

Through Environmental Design. Some predictions were as expected and were in line with the literature review as people felt safer after the boulevard project, but some were the opposite as expected, as it was believed that after the demolition of some of the houses that the project was built on, social cohesion will decrease, but it didn't and it was believed that this might have been one of the reasons for the increase of the safety feeling perspectives upon residents.

Keywords: Safety Feeling, Fear Of Crime, CPTED, Urban Sustainability, Built Environment, Perceived Neighborhood Safety.

PREFACE

The main purpose of this research was to explore the relationship between the built environment and the feeling of safety that individuals feel, and how that feeling is associated with urban sustainability and urban transformation in a neighborhood in Amman, Jordan that included a new urban idea in an old neighborhood in the city. And also to explore how urban planning and well-designed urban areas affect safety feeling and fear of crime at the neighborhood level. One of the main purposes as well was to explore Crime Prevention Through Environmental Design (CPTED) principles as a tool for reducing crime in urban areas and investigate the neighborhood safety feelings and fear of crime and their impact on the neighborhood in urban thinking. One of the approaches that was very interesting to start with, was to compare crime rates before and after the urban transformation has occurred. But in Amman, we couldn't obtain any data before 2017, as the project was launched in 2014 we needed data way before that and it was hard to get.

December, 2024

Omar Shammout

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ABBREVIATIONS

et al.	In multi-authored works, those after the first author
CPTED	Crime prevention through environmental design
PA	Physical activity
Before the project	Before the construction of the Amman Boulevard Project
After the project	After the construction of the Amman Boulevard Project
Boulevard	Amman Boulevard Project – Al-Abdali Boulevard

INTRODUCTION

The main objective of this study was to investigate the relationship between the built environment and individuals' sense of safety and how this sense is related to urban sustainability and urban transformation in a district of Amman, Jordan. Also, to investigate how urban planning and well-designed urban areas affect feelings of safety and fear of crime at the neighborhood level. Crime prevention through environmental design (CPTED) as a tool to reduce crime in urban areas and measure residents' feelings of safety was considered to improve neighborhood sense of security and fear of crime and how they influence the neighborhood. Despite the increase in witnessed crime rates in the neighborhood after the project, results showed that people felt safer after the construction of the boulevard project compared to the period before it. The main reasons for people's feeling of safety according to the study were the wide spread of police after the boulevard project and the maintenance and the well-designed streets that were offered after the construction of the boulevard project as well. Contrary to expectations, when investigating the second generation of the CPTED that is related to social cohesion and community involvement, people felt that the social cohesion of the neighborhood was higher, and that also played a major role in their safety feeling. The study conducted a quantitative method using a questionnaire that was answered by people who live in the neighborhood. 96 Responses to 29 questions were collected to measure safety feelings and fear of crime in the neighborhood and also to understand people's perspectives on social cohesion and community involvement and connect it to second generation CPTED. An in-depth literature review was carried out on both safety feeling and its relationship with the built environment, and Crime Prevention Through Environmental Design. Some predictions were as expected and were in line with the literature review as people felt safer after the boulevard project, but some were the opposite as expected, as it was believed that after the demolition of some of the houses that the project was built on, social cohesion will decrease, but it didn't and it was believed that this might have been one of the reasons for the increase of the safety feeling perspectives upon residents.

SAFETY FEELING: A DEFINITION

Safety feeling in a neighborhood is an important component of overall well-being and mental health. People who perceive their environment as unsafe tend to develop symptoms of depression and anxiety (Walsh, et al., 2017), these perceptions of safety influence various psychological outcomes. A research by (Booth et al., 2012) indicates that feeling of safety and mental health problems, such as distress, are connected among people who feel unsafe in their neighborhood. Another study by (Ford and Rachel, 2012) shows that parental perception of neighborhood safety is related to adolescent depression symptoms, implying that a safe neighborhood can be an important and protective factor for mental health. From the above, we can conclude that safety feeling has a strong relationship with improving mental health and positive physiological impacts upon individuals. In the aspect of urban planning, a lot of studies talked about the relation between built environment and safety feeling, where for example, it was found that residents perceived more safety in places where there were well-maintained public spaces and it was possible to see surroundings without any physical disorder (Silva and Osofsky, 2009). Safety feeling is a crucial aspect of urban planning, as it affects the well-being and quality of life of residents. When people feel safe in their neighborhoods and cities, they are more willing to engage in activities that contribute to urban development. Perceived neighborhood safety has also been found to be associated with changes in walking behavior, as it was found that perceived safety was one of the main factors influencing walking behavior (Kerr et al., 2015), suggesting that well-designed built environment is associated with feeling of safety. These studies investigated the relationship between the built environment and safety perceptions and potential moderating factors that may influence this relationship. Some of these studies aimed to provide policy implications from an urban construction perspective. The findings of these studies suggest that there is a relationship between the built environment and feelings of safety (Zeng et al., 2021). From the above introduction, we conclude that the feeling of safety is related to well-being and mental health and that a well-designed built environment could be a factor that improves this feeling of safety.

Therefore, a well-managed and well-designed built environment will improve the physiological aspects of people.

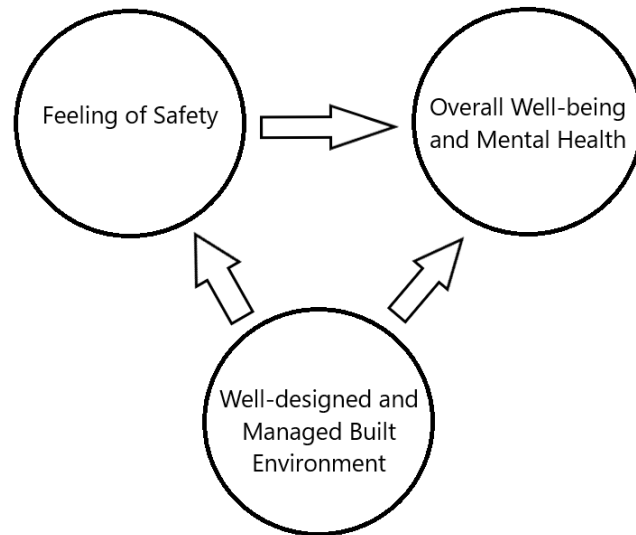


Figure 1 Relationship between built environment, feeling of safety, and overall well-being and mental health

SAFETY FEELING AND BUILT ENVIRONMENT

Talking about the safety feelings of individuals and their relationship to crime in a neighborhood is an essential topic to help us understand the relationship between feelings of safety and the built environment. Most papers collectively suggest that there is a complex relationship between perceptions of safety and crime rates in a neighborhood, for example in the literature review made by (Foster and Giles-Corti, 2008) concludes that perceived safety tends to influence the physical activity of groups already known to have greater anxiety about crime, and some elements of the built environment that influence safety appear to limit physical activity. However, the evidence is somewhat inconsistent, and this may be due to measurement limitations. Many studies use generic safety measures that make complete references to crime or use composite variables that lack specificity. Physical activity outcomes also require consideration, as only activities occurring locally outdoors are likely to be affected by neighborhood crime (Foster and Giles-Corti 2008). Perceptions of higher rates of violent crime and discomfort were positively associated with feeling

unsafe (Putrik 2019), and the correlation between perceived safety and reported crime varied, and factors such as gender and length of residency influenced perceptions of safety (Ogneva-Himmelberger, 2019), where specific neighborhood features can impact both recorded crime rates and residents' sense of safety (Ibrahim and Shahata, 2017). These findings indicate that perceptions of safety are influenced by various factors beyond just crime rates in a neighborhood. In order to answer the question of what are the aspects that affect the feeling of safety in the neighborhood, an in-depth study in Crime Prevention through Environmental Design (CPTED) and its principles and theories is essential to better understand how the built environment plays a critical role in reducing crime and how the sense of safety, crime rates, and the built environment are related.

CHAPTER ONE

1. CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

1.1. MAIN RESEARCHERS

Crime Prevention Through Environmental Design (CPTED) traces its roots to influential works in criminology and urban planning. Jane Jacobs, in “The Death and Life of Great American Cities” (1961) introduced the concept of 'Eyes on the Street'. Jane Jacobs argued about the role of natural surveillance in preventing crime and coined the term Eyes on the street. As such, CPTED focused on visibility, as well as community involvement. Timothy D. Crowe, in his work “Crime Prevention Through Environmental Design” (1971) expanded these notions. Oscar Newman in his publication “Defensible Space” (1972) introduced such concepts as territorial defensible space, also Shaw and McKay’s (1972) study showed that community attributes influence crime levels. Therefore, community-oriented crime preventive strategies gained importance. Shaw and McKay argued that the disorganization of the community was a result to the rates of crime. The theme of “Situational Crime Prevention” by (Ronald V. Clarke, 1980) involved modifying the immediate environment to limit chances for crime. This follows the principles of CPTED which aim at changing the physical environment to prevent crimes. The broken windows theory played a major key first studied by Philip Zimbardo in (1969) when an abandoned automobile was placed in a high crime neighborhood where it remained untouched for a week until part of it was smashed by a researcher. Within a few hours of the initial damage, the car was destroyed. The theory posits that in certain neighborhoods if a broken window remains unrepaired then it alerts others that this is the ‘norm’, and breaking more windows becomes more acceptable (Zimbardo, 1969). The theory then was proposed by (Wilson and Kelling, 1982) where they indicated that the presence of obvious indicators of disorder and a general lack of care in the environment creates a space that fosters crime. Thus, CPTED focuses on maintaining the integrity of the built environment for crime prevention. These foundational theories, combined with the ongoing evolution of CPTED as seen in Paul Cozens' "Crime Prevention Through Environmental Design” (2008). The work entitled

“Applications of Architectural Design and Space Management Concepts in CPTED” (2000) by Timothy Crowe is an interdisciplinary piece of work that incorporates knowledge from criminal, sociological, and urban-based studies. The table below shows the main works previously discussed. An addition to the table’s headings (Criticizing, gap and limitation) were added to the table in the discussion part.

Table 2 Main researchers and theories of CPTED

Researcher(s), Year.	Theory	Main Idea	Finding
Jane Jacobs, 1961	Eyes on the Street	The role of vibrant and diverse urban environments in reducing crime.	Natural surveillance helps in preventing crime
Oscar Newman, 1972	Territorial Defensible Space	Design physical environments that discourage crime and increase community safety	Well-defined boundaries and territoriality in a neighborhood can help reduce crime.
Norbert Elias, 1939	The Civilizing Process	Can be used to develop a critical perspective on defensible space	the relationship between power, behavior, emotion, and knowledge over time
Shaw and McKay, 1972	Social Disorganization	Community attributes influence crime levels	The disorganization of the community was a result to the rates of crime.
Ronald V. Clarke, 1980	Situational Crime Prevention	Manipulating immediate environments to reduce opportunities for criminal behavior	The goal is to make crime more difficult, risky, and less rewarding for potential offenders.
Wilson and Kelling, 1982	Broken Windows	If the presence of obvious indicators of disorder and general lack of care in the environment creates a space that fosters crime.	The level of disorder in a neighborhood provides a signal to motivated offenders that there is a lack of concern about the neighborhood
Timothy Crowe, 2000	Applications of Architectural Design and Space Management Concepts in CPTED	Critically evaluate the available evidence on the contribution of CPTED as a crime prevention strategy.	Environmental crime prevention works to lower the incidence of crime and also the fear of crime in the neighborhood, and talks about social participation.

1.2. FEAR OF CRIME AND CPTED

For a crime to occur four elements come together: the victim or target, the offender, the opportunity and the location or setting (Brantingham and Brantingham, 1991). Researchers from different backgrounds have explored fear of crime in the

last 50 years or so, it became a social problem of great importance as it affects how people behave and the quality of life (Hale, 1996). Fear of crime can encourage penalties and may erode the legitimacy of the legal system such that citizens feel obliged to administer their own 'justice'. The effects of the fear of crime are so broad and deep that it should be constantly monitored on the timely detection and prevention of consequences (Farrall, et al., 1997). Crime Prevention Through Environmental Design discussed safety feeling and fear of crime over the years. CPTED is a strategy that has gained recognition in recent years for its effectiveness in reducing crime and promoting safety in urban areas where it suggests that the design of buildings, landscaping and outdoor environments can either encourage or discourage crime. The primary goal of CPTED is to determine crime and promote safety by designing the physical environment in a way that reduces opportunities for criminal activity (Crowe and Fennelly, 2013). By implementing CPTED principles, urban planners can contribute to creating safer and more livable communities that promote social interaction and support community cohesion (Cozens, 2015). Although fear of crime and CPTED are connected as previously mentioned in the previous discussion, an investigation of the characteristics of CPTED at the house, street, and neighborhood level in two residential areas in Queensland, Australia found that the presence of CPTED may have effected reduction in crime, but had no effect on fear of crime (Minnery and Lim, 2005) to conclude that more empirical evidence should be done, and researches should be conducted to understand the complex relationship.

1.3. CPTED MAIN PRINCIPLES

In general, CPTED aims to design spaces that deter criminal activity by manipulating the built and natural environment. Main principels of CPTED include:

1. Natural Surveillance:

- Designing the environment to maximize visibility and observation by both residents and law enforcement. (Newman, O. 1972).
- Examples: Clear sightlines, well-lit areas, and windows overlooking public spaces.

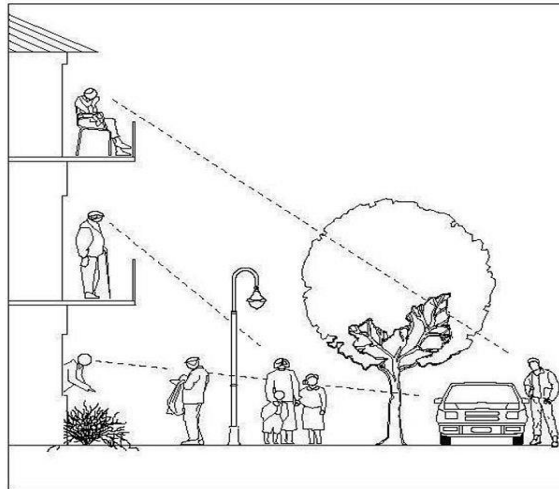


Figure 2 Natural Surveillance (Ceccato, V. 2019)

2. Territorial Reinforcement:

- Creating a sense of ownership and clear boundaries to establish a sense of territoriality among residents. (Jeffery, C. R. 1971).
- Examples: Landscaping, signage, and public art to define boundaries and express a sense of ownership.



Figure 3 Territorial Reinforcement (Kivaka L., 2018 and Webb S., 2018)

3. Access Control:

- Regulating and controlling access to spaces to minimize opportunities for crime. (Jeffery, C. R. 1971).
- Examples: Fencing, gates, controlled entrances, and landscaping to guide people through desired paths.

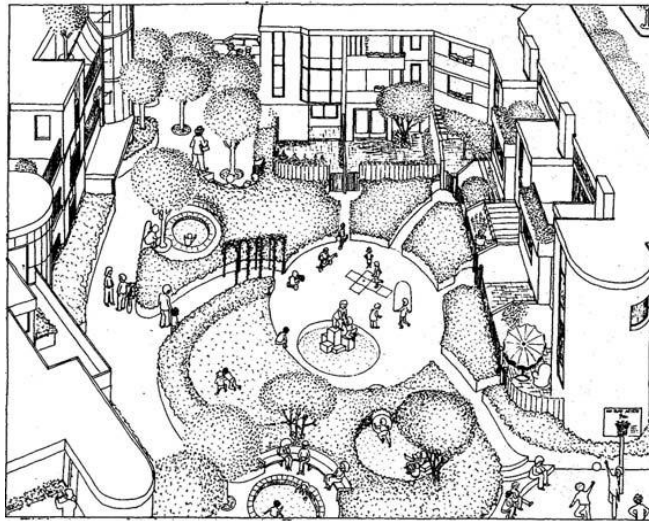


Figure 4 Access Control (Marcus & Sarkissian, 1986)

4. Maintenance and Management:

- Ensuring that the environment is well-maintained and managed to prevent signs of disorder or neglect that may attract criminal activity. (Crowe T. 2000).
- Examples: Regular maintenance, proper lighting, and prompt repair of damaged infrastructure.

5. Target Hardening:

- Implementing physical measures to deter or prevent crime, such as security lighting, fencing, or surveillance cameras. (Ronald V. Clarke, 1980)
- Examples: Security lighting, surveillance cameras, and locks on doors and windows.



Figure 5 (Max Naylor at English Wikipedi, 2006)

6. Image and Design:

- Shaping the physical environment to create a positive and inviting image that discourages criminal activity. (Cozens P., 2008).
- Examples: Public art and murals, architectural harmony, green spaces.



Figure 6 Image and Design (Van Ambruce Ligutom, 2019)

7. Community Involvement (Activity Support): - 2nd generation CPTED

- Engaging the community in the design and management of spaces to promote a sense of ownership and responsibility. (Eck, et al., (2012).
- Examples: Community gardens, neighborhood watch programs, community events and festivals.

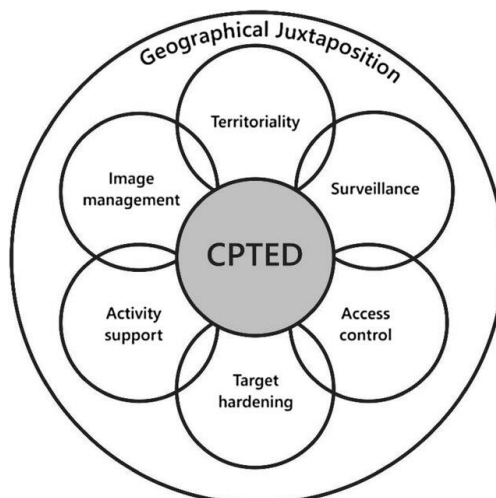


Figure 7 The Six Principles of CPTED (Cozens et al., 2019)

1.4. RESEARCH LIMITATION RELATED TO CPTED

When CPTED was firstly introduced (first generation CPTED) in the 60s, 70s and 80s mainly by Jacobs, Newman, and Wilson and Kelling it was reviewing the urban design and crime prevention in individual forms, taking in consideration only the people themselves as individuals and physical elements as they act alone. (Saville and Cleveland, 1997: 2008) made the term “second-generation CPTED” where they took social and psychological aspects of urban design under consideration. Jeffery later work (Jeffery 1990) as well focused on the relationship between the social and physical environment in crime prevention. Despite that the CPTED principles now are commonly used in urban design guidelines and manuals UK’s Secured by Design (Armitage and Monchuk, 2011), Canada’s SAFE Design Standard® (SAFE Design Council, 2015), and some European standards (Cardia, 2013), it is still not widely used in all urban design guidelines worldwide. Obtaining adequate, comprehensive, and location-specific crime data is often difficult (Armitage et al., 2011). Studies often lack analytical precision, and results can vary widely or be contradictory (Lorenc et al., 2013). Many studies “suggest” that design can influence crime, but do not necessarily “prove” empirically the accuracy of this relationship (Cozens and Hillier, 2008). Good evaluation of individual CPTED projects lack a lot from research quality problems, and that makes it hard to make good outcomes out of them. (Cozens and Love, 2015).

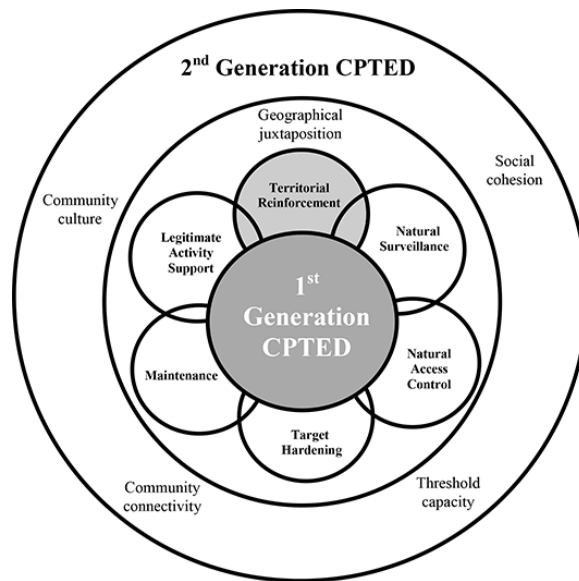


Figure 8 Second Generation of CPTED (Cozens et al., 2019)

1.5. MAIN APPROACH OF THE STRUCTURE OF THE CPTED LITERATURE REVIEW

In this section of the literature review, a focus on some of the literature reviews, thesis, articles, journals, etc., in the fields of CPTED, safety feeling and fear of crime in the context of the urban form was carried out. Any research work must contain a literature review which helps scholars place their works in the bigger scholarly debate and further the existing knowledge. It is locating the scholars' contribution in a larger scholarly discourse and adds to what has been known already. Thus, literature review provides a groundwork for determining the state of current knowledge about the topic, unclear areas, and what else one needs to study (Hart, C. 1998).

28 Researchers were selected and studied carefully from electronic databases where they included the combination of the keywords CPEDT, safety feeling, fear of crime, physical activity, urban transformation, neighborhood safety, or at least 4 of the keywords combined. All selected researches were in the English language, (19) of them used the quantitative method as their main research method, 5 of them used mixed-method approaches, and 4 were literature reviews without a method of collecting data. Table 3 summarizes the results that were reviewed, with adding the methodology and the sample/area of study sections to the previous table 2 form.

Findings of the papers will be discussed later. Note that the selected papers were world-wide and without considering the date of publication (where most researchers take last 5 to 10 years while doing their researchers) as the CPTED field is not a very old subject and theories from the 60s and 70s are still used to this day. An approach to analyze the data collected, is to mark results in relationship with the “second generation of CPTED” (Saville and Cleveland, 1997)”, “social CPTED” (Mallett, 2004), or “community CPTED” (Plaster Carter, 2002) beyond the physical design where social, socio-economic, physiological aspects and the neighborhood as a community are included. With that, we tried to answer the following question: how do architecture and built environment affect the neighborhood using CPTED, and result in lower crime rates beyond the physical aspect? Manipulating physical environment leads to crime prevention and affects social cohesion via architecture, also social cohesion and community participation lead to crime prevention.

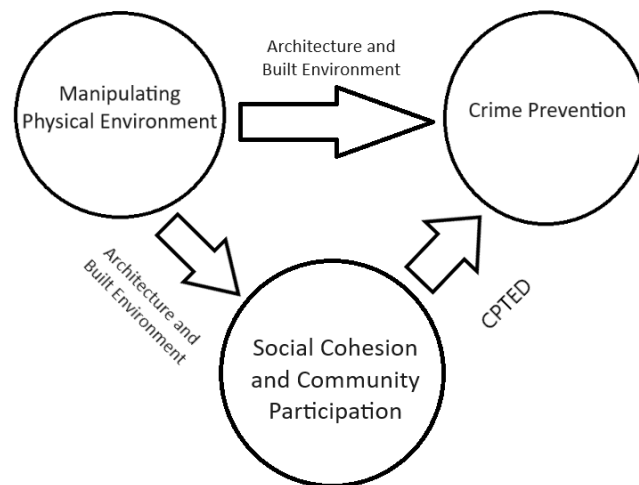


Figure 9 Relationship between the physical environment, social cohesion, and crime prevention

To answer the above question, figure (9) was carried out to simplify it. First generation of CPTED suggested that architecture and built environment manipulate the physical environment in order to reduce crime and that manipulation was only physically related. Second generation of CPTED suggested that social cohesion and community participation should be taken into consideration as factors while studying CPTED to have better CPTED applications. But in fact, social cohesion and community participation are not only factors affecting CPTED, but also results from

the manipulation of the built environment itself. So a combination of both would implement the best result in Crime prevention (CPTED first and second generation together). The manipulation of the physical environment in urban design has been shown to have a significant impact on social cohesion where it was founded that a positive perception of the physical environment and frequent use of facilities can enhance community cohesiveness (Seo 2014; Calvo and De Rosa 2017; Dempsey 2009; Abella 2020).

Reference	Area, site/sample	Methodology	Aim
1. Bennetts et al., 2017	People living and/or working in an urban precinct of Adelaide, South Australia.	Pilot study with interviews and micro-scale analysis.	Effectiveness of Crime Prevention Through Environmental Design (CPTED) principles on people's feelings of safety and comfort in an urban area.
2. Israel et al., 2014	Residents of Oshogbo, Nigeria	Survey and data analysis	Residents' feeling of safety at home, work, and public places, effectiveness of crime management strategies.
3. Zeng et al., 2019	Residents in a built environment in Mianyang, China	Structural equation model to study the relationship between the built environment and residents' safety perception	Explores the mechanism by which the built environment affects perceived safety and considers multiple influence pathways.
4. Abed and Aljibarat, 2023	Residents in a neighborhood in Zarqa, Jordan	Qualitative analysis interview based and Quantitative analysis questionnaires structured based	Impact of physical incivility signs on perceived safety at the neighborhood level.
5. Sharaf et al., 2023	Al Abdali Boulevard project in Amman, Jordan	SWOT analysis	Address how public space quality assessment can be measured alongside evaluation tools.
6. Foster and Giles-Corti, 2008	Worldwide Literature reviews, articles and journals etc..	Literature review of 41 papers related to crime and safety, or PA and safety.	Explore the relationship between safety and constrained physical activity.
7. Anderson et al., 2013	Comparison group of neighborhoods in Los Angeles, USA.	Quantitative methods include analyzing crime rates, spatial analysis, and statistical modeling.	Observe changes in crime rates in an area before and after a zoning change and compare crime in the area similar to crime in comparable areas that have not undergone zoning changes. In this way, a try to observe the following: what would crime be like if there were no zoning change?

8. Köseoğlu et al., 2022	People settled in houses after the urban transformation in Bezirganbahçe, Istanbul, Turkey.	Qualitative research using thematic analysis, with observations and semi-structured interviews.	Explore the impact of urban transformation on the psychological and spatial experiences of the residents.
9. Alamoush et al., 2018	Rainbow street in Amman, Jordan.	Qualitative analysis using thematic analysis, observations, and Quantitative analysis questionnaires structured based	Explore the effect of landscape features towards comfort character of traditional streets in Amman, Jordan.
10. Shepley et al., 2019	American literature reviews, articles and journals etc.. in all cities of the USA.	Literature review using PRISMA checklist. 45 selected research papers.	Explore the effect of nature in urban environments towards violent crime.
11. Gibson and Johnson, 2013	Worldwide Literature reviews, articles and journals etc.. in the field of CPTED	Directed Content Analysis (DCA) of CPTED frameworks. 64 papers were selected.	Reviewing the framework used to identify CPTED
12. Cozens, 2008	Literature Review talking about Western Australia	Literature Review	The effect of CPTED in urban sustainability, and the association between crime and fear of crime with the framework of CPTED
13. Mihinjac and Saville, 2019	Literature Review	Literature Review	Explore the definition of 3 rd generation of CPTED
14. Doğrusoy and Zengel, 2017	Visitors of urban parks in Izmir	Survey and data analysis	Explore the key factors that affect perceived safety in public parks,
15. Shcheglova, 2022	-	Literature Review and conceptual analysis	Explore the urban safety definition based on social emotions and actions.
16. Rashid et al., 2017	Streets located in Kuala Lumpur, Indonesia.	Qualitative analysis using direct observations, and Quantitative analysis questionnaires based	The importance of street as public space in contributing towards safety perception
17. Gerçek and Güven, 2021	Residents in an area in Izmir, Turkey	Quantitative analysis of questionnaires based and statistical analysis	Explore how aspects of safety such as criminal acts, public order, and sense of community affect perceived safety.
18. Furr et al., 2005	Residents and Refugees from the former Soviet Union in Louisville, Kentucky, USA	Quantitative analysis of Louisville Metropolitan Survey (LMS) data.	Explore perceptions of safety in refugee neighborhoods
19. Zani et al., 2001	Adolescents in different cities in north-central Italy	Quantitative analysis of questionnaires based and statistical analysis	Explore the adolescents feeling of not feeling safe, sense of community in the urban context

20. Bromley and Stacey, 2012	Older children in two contrasting British urban residential areas and in the city center.	Quantitative analysis of questionnaires based and statistical analysis	Examines older children's feelings of fear/safety in 2 urban areas in the UK (Poor and Wealthy)
21. Salehi, 2012	City dweller's in Tahrán, Iran	Quantitative analysis of questionnaires and direct observations. Theoretical data by attributive studies	Explore the relationship between CPTED and safety feeling
22. Özhancı et al., 2014	Participants assessing images of Atatürk University's campus.	Quantitative analysis of survey and visual assessment study	Determine the effects of safety by evaluating the role of plantation in the design of safe urban landscape
23. Šoltés et al., 2021	Campus of the University of Žilina in Slovakia	Qualitative analysis direct observations based and reported data from Police.	Realize if the physical environment and urban development can have an impact on the safety of the campus using CPTED
24. Thani et al., 2016	3 urban parks in Shah Alam city, Malaysia	Quantitative analysis of questionnaires and SPSS	Define main CPTED principles in designing urban parks.
25. Lee et al., 2016	24 neighborhood from Seoul, Korea 12 of which implement CPTED principles and 12 with relation to fear or crime and walking frequency	Analyzing behavioral data of the residents.	Explore the effects of CPTED on walking frequency and fear of crime.
26. Iqbal and Ceccato, 2016	A high level of crime park in Stockholm, Sweden	Qualitative analysis using direct observations, and Quantitative analysis questionnaires based	Evaluate the effects of CPTED on the inventory of safety in urban parks.
27. De Biasi, 2017	Undergraduate students enrolled at a large East Coast university in the USA	Quantitative analysis questionnaires based	Assess the effect of incorporating CPTED standards into traditional urban greening practices of vacant lots on fear of crime
28. Landman, 2009	-	Literature review and analysis	To show that there are different approaches (segregated and integrated) to addressing safety in the built environment

Table 3 Comparison between different studies on CPTED

Other than the previous studies related to CPTED, safety feeling and fear of crime in the built environment, some papers that were added to table (3) were related to landscape features, green spaces, and physiological effects of urban transformation, made us understand better how the built environment is interacting with individuals on all scales, from physiological related issues, to mental stability, over-all health, levels of happiness, feeling of safety on the individual and the

neighborhood level, and how the built environment is one of the ways of making the community more connected and to achieve social cohesion. Meaning that studying all aspects of how can the built environment interact with human beings is an approach to how the environmental changes improve life quality. Research consistently shows that the built environment significantly impacts quality of life (Cerletti et al., 2021). Related to our field of study, research on CPTED approach consistently demonstrates its positive impact on the built environment and quality of life. CPTED projects led to increased social activities and a stronger sense of community among residents (Seo and Lee 2017). The environment is a major contributor to crime and urban safety and there is a need to plan and design to reduce vulnerability to crime and increase sense of security among citizens (Salehi, 2012). Studies that had shown that social cohesion and community participation as methods to increase the application of CPTED and make it more effective in reducing crime rates. Studies that had shown that social cohesion and community participation as methods to increase the application of CPTED and make it more effective in reducing crime rates, suggested that effective crime management strategies, include social development, community-government interaction, and environmental design, leads to a good sense of safety at home, work, and in public places (Israel et al., 2014) and implications of different safety approaches on urban form, daily lives, and city planning and management can increase the urban safety (Landman, 2009). Urban safety is defined as a feeling based on social emotions and expressed through specific discourse and social actions, rather than just a low crime rate and protection from external threats (Shcheglova, 2022) and the quality of public urban space is the result of considering physical and social factors from the design and planning stages to create successful public spaces (Sharaf et al., 2023). In a rare study done by (Furr et al., 2005) in a neighborhood that includes residents and refugees from the former Soviet Union in Louisville, Kentucky, USA suggested that refugees from the former Soviet Union had higher perceptions of safety despite being less satisfied with their neighborhoods, suggesting that social change and contextual shifts play a greater role in their safety perceptions. Additionally, urban transformation leads to a shift in the residents' perception of safety and experience of the neighborhood (Köseoğlu et al., 2022). The variables of the built environment, social factors, and physical activity all

significantly influence perceived safety (Zeng et al., 2019) but on the city level, safety in the city is highly associated with peoples' opinions about crime incidences and other safety and public order issues (Gerçek and Güven, 2021).

A newer generation theory called the “3rd generation” of CPTED is being discussed as well, where livability hierarchy, public health, sustainability and quality of life are key factors as well associated with CPTED (Mihinjac and Saville, 2019). And that doesn't only apply on adults, as a study done by (Zani et al., 2001) suggested that adolescents' sense of community and safety in urban environments vary by city size and gender, with personal involvement in negative situations strongly predicting unsafety. To support that study, another study suggests that older children in deprived urban areas feel less safe than their wealthier suburb counterparts, but feel safer in the city centre, with gender differences affecting perceptions of safety where also boys and girls feel the same in their home area, but boys feel more safe than girls in city centers (Bromley and Stacey, 2012).

CPTED principles, such as activity, maintenance, and sight lines, can enhance people's feelings of safety and comfort in urban environments, but personal safety strategies also play a role (Bennetts et al., 2017). On the contrary, abandoned buildings, alleys, and poor lighting are significant physical incivility signs affecting perceived safety (Abed and Aljibarat, 2023) which can support back the Broken Windows theory. Another factor should be put into consideration is the gender, where it was found that street design significantly impacts women's safety perception with physical elements in the street significantly affecting their safety perception (Rashid et al., 2017) as (Foster and Giles-Corti, 2008) as well suggest that there's no specific evidence to say that crime related safety affects PA, the results from that research suggest that especially for women and older adults crime related safety affects PA. A key factor related to crime prevention and urban sustainability is landscape and green areas, where it was found that the green areas and natural landscape features reduces violence or violent crimes in the urban form (Shepley et al., 2019) through the maintenance of landscape features and placing them right which also leads towards comfort while walking in streets (Alamouh et al., 2018). CPTED principles can improve public safety in urban parks by enhancing visibility,

reducing crime, and enhancing overall park design (Thani et al., 2016) where they effectively guide the inventory of safety conditions in urban parks, highlighting the importance of design and management in enhancing safety (Iqbal and Ceccato, 2016) and incorporating CPTED into urban greening practices of vacant lots may reduce fear of crime (De Biasi, 2017). But on the other side, sometimes urban park users' perceived safety is influenced by factors beyond fear of crime, including way finding ability and environmental satisfaction (Doğrusoy and Zengel, 2017). In an assessment study, plant design and urban climate aesthetics were found to play a significant role in enhancing safety perceptions in urban landscapes, with people feeling more secure during seasonal foliage and when sites are clearly defined by plant tissue differences (Özhancı et al., 2014).

CPTED measures, such as sufficient closed-circuit television, street lighting, and maintenance, significantly reduce fear of crime and increase active living in neighborhoods (Lee et al., 2016) and implementing CPTED theories in urban planning policies is a sure thing especially after all what the CPTED has been showing in the past years in reducing crime, and fear of crime in public spaces, neighborhoods, and university campuses as well as in the (Šoltés et al., 2021) study.

Urban planning in association with CPTED reduces crime and improves safety by changing the physical environment but more research in the same framework is needed so that CPTED works as a policy (Gibson and Johnson, 2013) where crime and fear of crime need to be considered while aiming for a better urban planning, and these issues are not represented in the sustainable urban design (Cozens, 2008).

CHAPTER TWO

2. CASE STUDY AND RESEARCH METHEDODOLOGY

2.1. OVERVIEW OF THE SITE

The site of the Boulevard Amman Project in Amman the capital city of Jordan, is a new project that was opened in 2014 as a new urban development idea in the neighborhood of Al-Abdali. It is the first project in Amman to be developed under the new local mixed-use planning codes according to market studies by E&Y. The project consists of 384,000 m² of land area with over 3,000,000 m² built-up area and a total cost of over 5 billion US dollars. The boulevard has residential, offices, retail and entertainment, hospitality, and medical immunities (The Abdali, 2023). The character of the new boulevard project was new to Amman because this area is an old neighborhood known for its old stairs, streets, and identity. The neighbors have known each other for generations. When the new project began, the developer bought up all the houses in the area and built the project on top of them. The sample for our study is the remaining segment of society still living in the area surrounding the project. Figure (10) shows the boulevard project and its surroundings, where it is noticeable that the project acting like an odd component to the neighborhood, and doesn't match the skyline of the city.



Figure 10 Al-Abdali Boulevard Project, Amman (Al-Abdali Group Procure, 2019)

LEGEND: Residential Commercial Hotels
 Public Landscaped Area private Landscaped Area Medical



Figure 11 Land-use plan of the Abdali boulevard project (Sharaf et. al, 2023)



Figure 12 Attractive landscape character and pedestrian pathways in Abdali Boulevard (Sharaf et. al, 2023)



Figure 13 Fountains and water elements in Abdali Boulevard (Sharaf et. al, 2023)

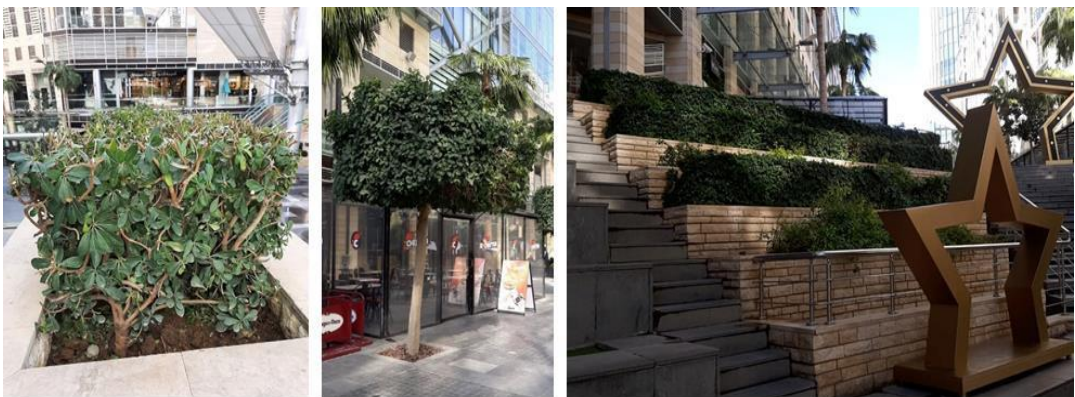


Figure 14 Attractiveness and appeal character, trees and plants (Sharaf et. al, 2023)



Figure 15 Public-open spaces as strong points in the Abdali project (Al-Abdali Group Procure, 2019)



Figure 16 Showing the Abdali project as a new center for governmental buildings (Al-Abdali Group Procure, 2019)

To comment of the the last figure, only the area marked (abdali) is the area that changed in the neighborhood with the new urban project, anything outside the red line stayed the same. The project contains:

1) Hotels:

Amman currently has 188 hotels of all categories providing the market with 13,069 rooms. Out of the 17 Five Star hotels in Amman that provide 4,790 rooms and suites, Abdali currently contributes over 1,000 keys via The Boulevard Arajaan,

Amman Rotana and The W Amman hotels. More hotels are being developed at Abdali including Le Gray Hotel and other development opportunities.

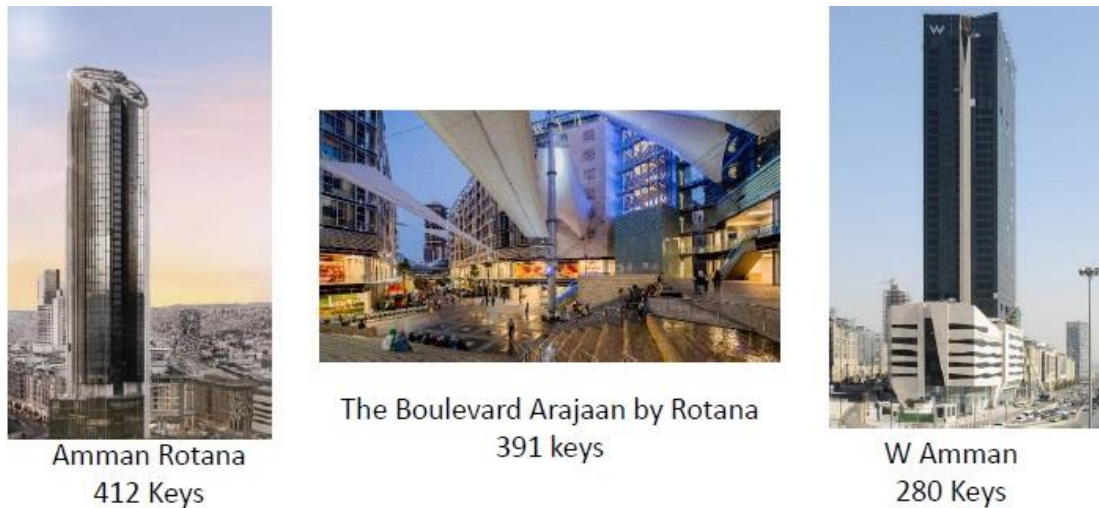


Figure 17 Hotels in the Abdali Project (Al-Abdali Group Procure, 2019)

2) Residential buildings:

Abdali contains over 970 thousand SQM of prim residential developments, making Abdali a central residential hub in the middle of Capital.



Figure 18 Residential areas in Abdali (Al-Abdali Group Procure, 2019)

3) Retail & Entertainment at Abdali

Abdali is providing around 400 thousand SQM of retail and entertainment spaces that include scenic rooftop terraces, the Boulevard pedestrian market in addition to the Abdali Mall. (Al-Abdali Group Procure, 2019)



Figure 19 Abdali mall (Al-Abdali Group Procure, 2019)

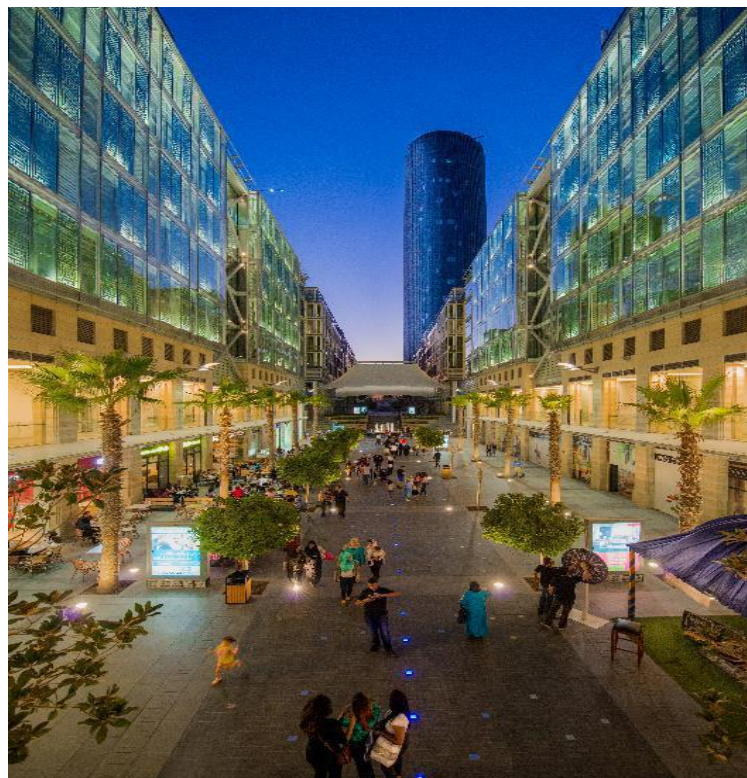


Figure 20 The Abdali boulevard (Al-Abdali Group Procure, 2019)

2.2. METHODS

2.2.1. Scope of the Study

The scope of this study was to explore safety perceptions and crime prevention measures within the built environment, specifically focusing on the impact of the Boulevard project in Amman. The primary research question guiding

this investigation is: "Did the implementation of (CPTED) principles, both first and second generation, influence the safety feeling and crime prevention within the neighborhood surrounding the Boulevard?" The method that was used to conduct this study was a quantitative analysis of 96 questionnaires with 29 questions to the people living in the neighborhood of the Boulevard, Amman, and the neighborhood surrounding the Boulevard, to find out their perspective on the feeling of safety and fear of crime before and after the Boulevard project. Hence, people who answered the questions are people who live in the neighborhood and have experienced the changes before and after the project.

The study's focus remains exclusively on the built environment, and factors such as psychological, economic, and political influences are beyond the scope of this research.

2.2.2. Pilot Study

Boulevard appearance drew many external visitors which triggered anxiety among residents. Contrary to expectations, the pilot study of the first 12 answers unveiled a paradoxical outcome: although the urban project sought to improve security, residents reported becoming less safe upon its completion, especially in the building process, but after widening the scale of the study that finding was the opposite. As figure (11) shows, people answered the questions regarding safety with most answering yes before the project. And no were answers to I felt more connected to my neighborhood after the project.



Figure 21 Pilot Study

At first, 49 questions were carried out, and after for a long time, a small number of people answered as people felt that the number of the questions was high and not a lot of people wanted to fill out the questionnaire. 20 questions were eliminated from the original questionnaire and only the most important 29 questions were asked to get a wider scale and to get as many answers as possible.

*Questions are shown in a separate chapter at the end of the study

2.2.3. Structure of the Questionnaire

The updated questionnaire had some questions with multiple choices and respondents can choose more than one option in them. For example, instead of asking have you ever witnessed any car accidents before the project, or have you ever witnessed any fights after the project, some questions were asked in the form of “Did you witness any crime before the project, if yes please specify which one” and more than one box could have been chosen, and the same type of question for after as well. By doing this, we eliminated the number of questions to make them less in quantity but more complex in quality to get better results and have a better analysis on them. Questions had been asked in Arabic, as this is the first language spoken in the city, and the results were then translated into English. These questions were created in google forms, then were uploaded to Facebook groups that contained a high number of people from Amman, Jordan. These groups are for people of the neighborhood that surrounds the project that people use to talk and ask about whatever they like. By using this method we tried to reach as many participants as possible, rather than knocking on the doors.

The questions related to feelings of safety and fear of crime were linked to the 7 CPTED principles to provide a better understanding of CPTED in the neighborhood and to take these principles into account when collecting responses. The questionnaire consisted of the following 3 sections:

First section – Demographic questions: (gender, age, working status)

“Gender and age” were important factors, as the results of the literature review showed that feelings of safety and fear of crime differ among women, young people, and older people (especially those over 65), and the results showed that

feelings about crime affect physical activity and feelings of safety among these groups. Work status was also an important factor, as people who go to work have lower observational accuracy than people who do not work and can observe the neighborhood all the time, compared to the working group.

Second section: (1st generation CPTED)

In this section, questions related to the first generation of CPTED and physical activity were asked to gain a better understanding of the relationship between the physical activity of people in the neighborhood and CPTED

Third Section: (2nd generation CPTED)

Questions in this section were related to the second generation of CPTED, to gain a better understanding of the relationship between the residents of the neighborhood, the community, and social cohesion.

CHAPTER THREE

3. FINDINGS

The statistical analysis of this study was performed using the Statistical Package for the Social Sciences (SPSS), version 29.0.2.0 (20). SPSS is a widely utilized software package that facilitates the analysis and interpretation of data, offering a comprehensive set of tools for descriptive statistics, inferential statistics, and data visualization.

Social Cohesion

The main purpose of the study was to see if the safety feeling of the residents of the neighborhood increased or decreased after the project and to connect it to CPTED principles first and second generation as well, and to investigate more on the second generation CPTED principles that talk about community participation and social cohesion. The findings revealed a different perspective, with a majority expressing that community cohesion was stronger before the project, indicating familiarity and a sense of shared identity among residents for before the project, despite feeling more safe after it. When asking “At what point do you think social cohesion and community participation in the neighborhood are highest?” 55.2% of the participants answered with after the project. We believed that this demolition of the old houses caused a disruption in existing relations among the residents but the answers were opposite to what was expected, and we also believed that without the demolition maybe social cohesion was higher before the project as people knew each other more.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Before	53	55.2	55.2	55.2
	After	43	44.8	44.8	100.0
	Total	96	100.0	100.0	

Table 4: Social cohesion

To have better results on how people think about social cohesion and community involvement, and if we can actually connect the results with the CPTED 2nd generation, some questions were asked to know what kind of thinking people have in their minds about social cohesion, the community, and the volunteer work in general. People in the neighborhood were not active socially before and even after the project, as 46.9% of the residents didn't engage in any kind of volunteer work in their lives, and the second most majority said they went once or twice in their lives compared to only 8.3% for people who are actually doing volunteer work. Also some questions were asked in the survey to explore peoples' perspective on social activities. Ratios between before and after the project for social gathering and attending community center as well were approximately the same, and people who are actively participating in social activities are the same people, this could give an indication that the project itself didn't affect peoples' decision to do so.

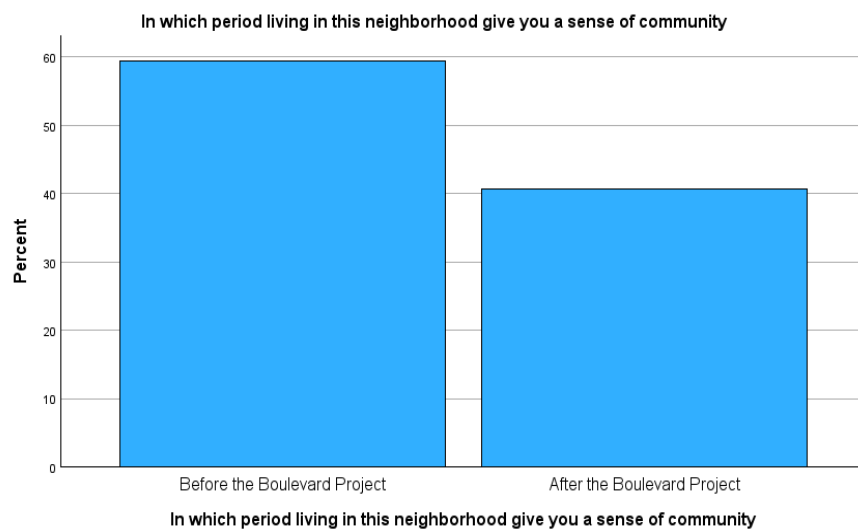


Figure 22 Sense of community

Sense of belonging to the community before the project was built - Sense of belonging to the community after the project was built

Mean	Std. Deviation	Paired Differences			Significance	
		Std. Error Mean	95% Confidence Interval of the Difference		One-Sided p	Two-Sided p
			Lower	Upper		
.125	.653	.067	-.007	.257	.032	.064

Did living in this neighborhood give you a sense of community before the Boulevard project was built - Living in this neighborhood gives you a sense of belonging to the community, especially after the construction of the Boulevard project

Mean	N	Std. Deviation	Std. Error Mean
1.34	96	.477	.049
1.47	96	.502	.051

Table 5: Paired Samples Test – Sense of belonging to the community

To prove the frequency, the above T-test was conducted to see if these two means are statistically difference from each other, and as the standrard of deviation shows that the two means are very close to each other.

One of our findings was that the project itself didn't add to the neighborhood any kind of new social gathering rather than open spaces "inside the project", but on the neighborhood level, people didn't change in "attending community gatherings" or "involving socially" because of the Boulevard.

Feeling Safe and Built Environment

Our major question was "Do you feel safe in the neighborhood after the construction of the boulevard project?" If the answer was yes, respondents were asked to choose the answer that was closest them. 62.5 percent of people answered "Yes – because of the presense of the police and surveillance CCTV cameras". When there are more police officers in a certain area, and they actively engage with residents, it makes people feel more secure. It's been indicated that if the community thinks that the police force is doing its job well and being active, then the feeling of security in the area improves. Only 16.7 percent of the participants answered "no" indicating that the highest percantage of the people in the neighborhood were feeling safe after the project. In total, answers that agreed to being safe were 83.%. The reasons were as following:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	16	16.7	16.7	16.7
	Yes - (there is more police presence and surveillance cameras in the neighborhood)	60	62.5	62.5	79.2
	Yes - (because of the Boulevard project itself and what it provides)	14	14.6	14.6	93.8
	Yes - (because of the local community or neighbors who came to the neighborhood after its establishment)	2	2.1	2.1	95.8
	Yes - (other reasons)	4	4.2	4.2	100.0
	Total	96	100.0	100.0	

Table 6: Feeling safe

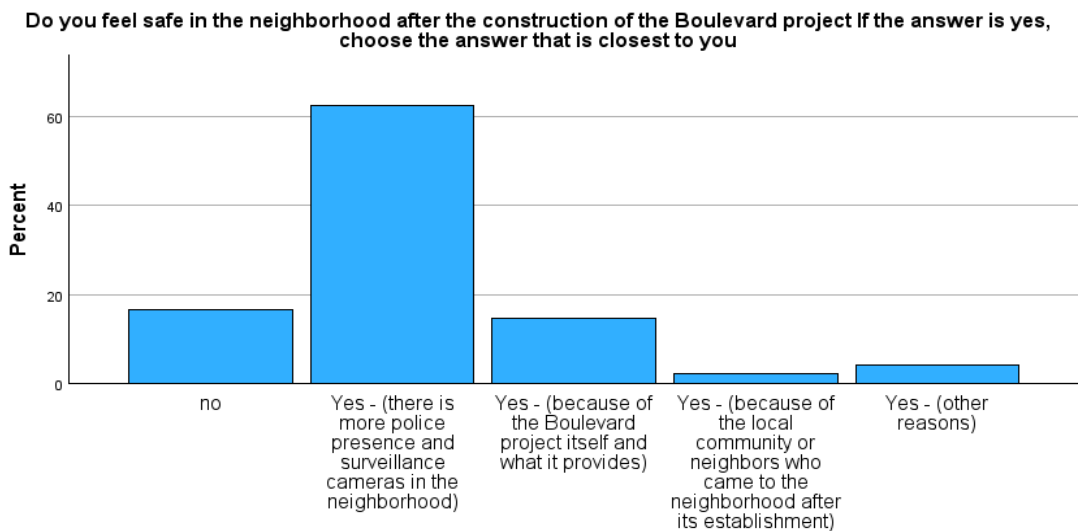


Figure 23 Feeling safe

The study data revealed that the perceived increase in safety after the Boulevard project was also attributed to changes in the physical environment. Residents noted that the layout of the transformed area, with its open spaces and commercial establishments, attracted more activities to the neighborhood, and that led to a feeling of safety among some residents as some said “we used to lack a lot of well-lit streets and open spaces, and now after the project we feel that we can see

each other at night” 94.8 percent answered that streets were best lit after the boulevard project

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Before the construction of the Boulevard project	5	5.2	5.2	5.2
After establishing the Boulevard project	91	94.8	94.8	100.0
Total	96	100.0	100.0	

Table 7: Street lighting

Ratios for going out alone before and after the project were approximately the same. What would make people fear of going out alone was asked and respondents can simply answer “no”- “I don’t fear to go out alone after the project”, or they can choose more than one option if they do. This question helped understanding what might be the reason for people to fear going alone after the project. 2 Answers were eliminated for people who were under 18 leaving the total result to 94 instead of 96 as we cannot compare the before and after for them as the project started in 2014 and their answers won’t be accurate.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	32	33.3	34.0	34.0
no	62	64.6	66.0	100.0
Total	94	97.9	100.0	
Missing System	2	2.1		
Total	96	100.0		

Table 8: Going alone – before the project

Are you afraid of going after the boulevard project, if yes you can choose more than one box.		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	66	61.1	65.3	65.3
	Yes – because of fear of visitors to the boulevard	16	14.8	15.8	81.2
	Yes – because of people from the local community or neighbors	10	9.3	9.9	91.1

	Yes – because the built environment and streets are not good (the physical environment in the neighborhood)	6	5.6	5.9	97.0
	yes – other reasons	3	2.8	3.0	100.0
	Total	101	93.5	100.0	
Missing	System	7	6.5		
Total		108	100.0		

Table 9: Going out alone after

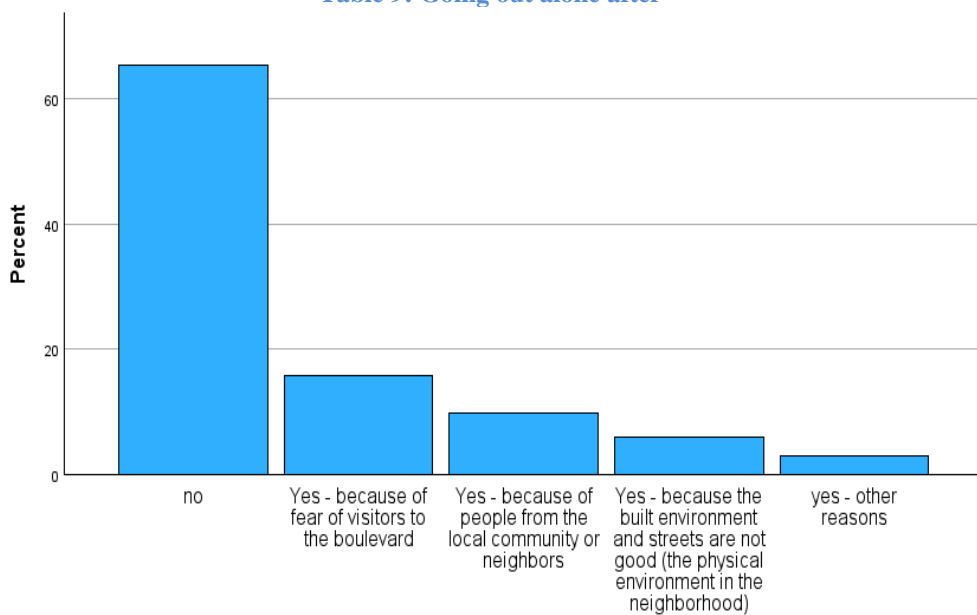


Figure 24 Going out alone – After

The highest number of answers for fear of going out alone was because of fear of visitors to the boulevard, which prove the original argument were foreign presence of people from outside the neighborhood has made people feel uncomfortable, and even fear the need of going out. Explaining this might be because of different factors. Socially, the arrival of new residents often brings cultural and demographic shifts. The existing community may feel a sense of displacement as the character and identity of the neighborhood change. This can lead to discomfort as the familiar surroundings transform into something unfamiliar. The new urban development project attracted more people, leading to an increase in traffic and noise levels. Existing residents may find it challenging to navigate the

crowded streets or deal with the additional noise pollution while going out. Also, as the population density increases (as people can buy houses inside the project), there may be concerns about a potential rise in crime rates which we will discuss later in this section.

Exploring whether residents believe that their area has improved following the construction of the Boulevard or not was one of the main research questions of the study.

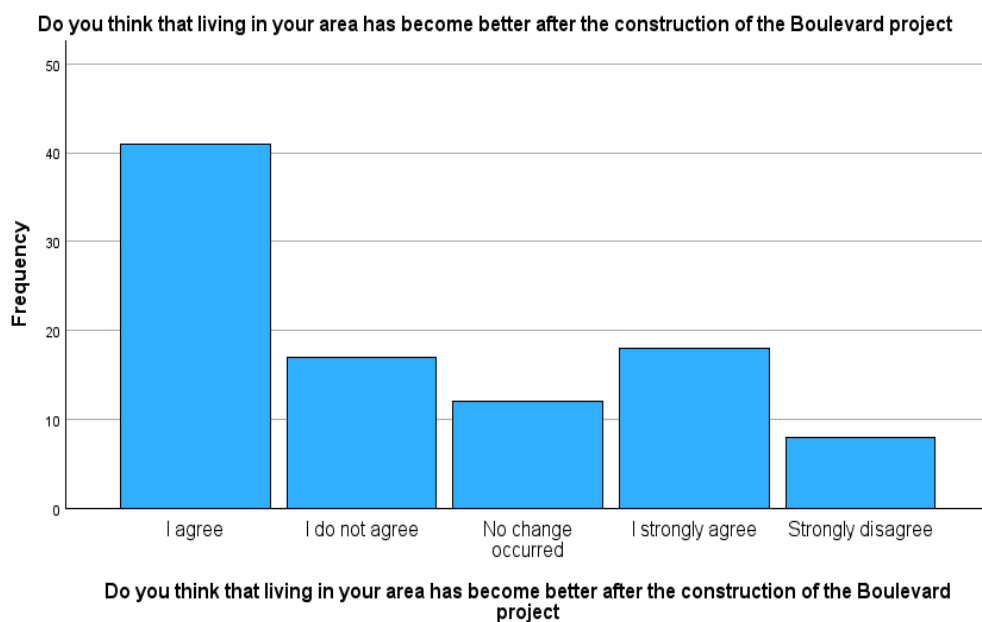


Figure 25 Living in the area after the boulevard

Results among the responds for that specific question were:

- 61.5% (42.7% + 18.8%) agreed or strongly agreed that their living conditions improved after the Boulevard project.
- 17.7% expressed disagreement
- 12.5% reported no significant change. 8.3% strongly disagreed with any improvement.

The majority of respondents acknowledging a positive change in living conditions could be linked to the improvements in the built environment facilitated by the Boulevard project. This may include upgraded infrastructure, enhanced public spaces, and overall aesthetic improvements. The positive responses may also be

associated with an increased sense of safety, potentially influenced by the spread of police presence in the area. This suggests that urban development projects can contribute not only to physical improvements but also to enhanced security perceptions.

The reported increase in social cohesion aligns with the idea that well-designed urban projects can foster community bonds. Improved public spaces and community facilities provided by the Boulevard project may have contributed to a stronger sense of connection among residents, and that led to improvement in their life quality.

Walking Patterns and Listening to Music

Walking patterns changed as well, from 59.4% for people who used to walk alone before the boulevard project to 75% for the answers after the project,

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Did you use to walk alone before creating the Boulevard project	.59	96	.494	.050
	Do you walk alone after creating the Boulevard project	.75	96	.435	.044

Pair: Did you use to walk alone before creating the Boulevard project - Do you walk alone after creating the Boulevard project

Mean	Std. Deviation	Paired Differences			Significance	
		Std. Error Mean	95% Confidence Interval of the Difference		One-Sided p	Two-Sided p
			Lower	Upper		
-.156	.621	.063	-.282	-.030	.008	.016

Table 10: Walking alone Paired Sample T

indicating more feeling of safety to walk alone after the boulevard.

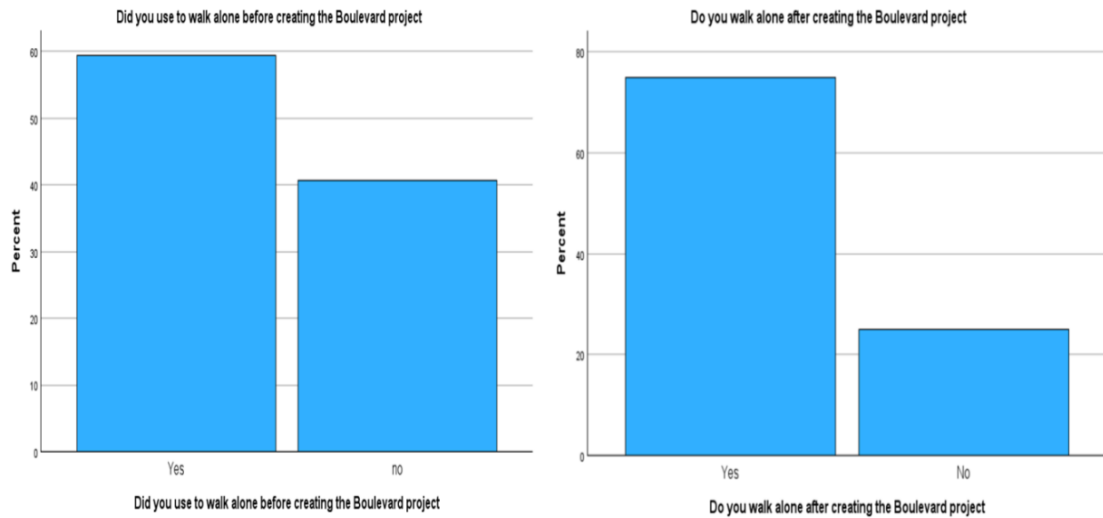


Figure 26 Walking alone - before-after

Also, answers for people who are listening to music while walking after the project increased, indicating also a better feeling of safety, and implicating that streets are now more suitable to walk and they do not “fear” from what’s surrounding them especially with the new streets and well-lit areas where people’s sense of fear of crime decreased.

Pair: When were the streets best lit - Do you walk alone after creating the Boulevard project

Mean	Paired Differences				t	df	Significance	
	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Side p
			Lower	Upper				
.198	.401	.041	.117	.279	4.842	95	<.001	<.001

Table 11: Streets lighting-Walking alone after - Paired Sample T

Pair: Did you listen to music while walking before creating the Boulevard project - Do you listen to music while walking after building the Boulevard project

Mean	Paired Differences				t	df	Significance	
	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Side p
			Lower	Upper				
-.177	.481	.049	-.275	-.080	-3.606	95	<.001	<.001

Table 12: Listening to music - Paired Sample T

*When the p-value is less than 0.001, it indicates a high level of statistical significance. This suggests that the observed results are highly unlikely to have occurred by random chance alone, providing strong evidence against the null hypothesis. In other words, the probability of obtaining such results if the null hypothesis were true is less than 0.1%, signifying a robust statistical significance.

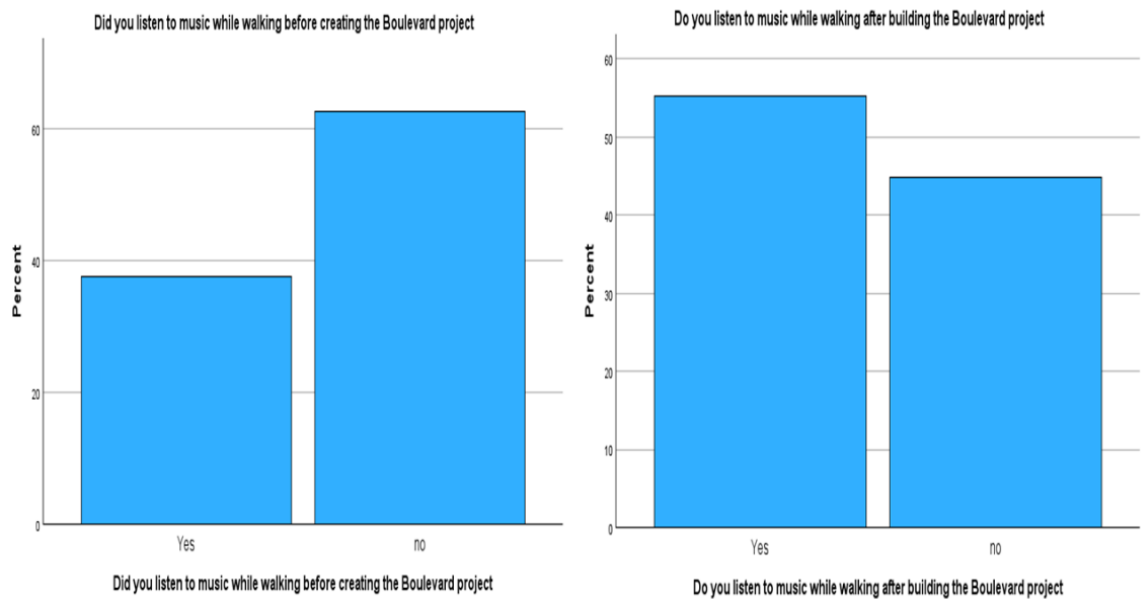


Figure 27 Listening to music before-after

Fear of Crime and Witnesses Crime

Questions related to fear of crime showed that people felt more safe after the project, main reason according to the participants for fear of crime was being afraid from the people who come to boulevard itself, as a lot of people come each day from all around the country, and even tourists, but only 6 percent were afraid to go out and had fear of crime because of the physical environment itself and the poor streets surrounding their houses. Fear of leaving the houses empty also was decreased after the project, most probably due to principles of target hardening and natural surveillance. For the 2nd generation of CPTED to actually work neighbours shouldn't only "know" each other but they should also "care", as discussed that social cohesion increased after the project meaning people felt more safe to leave their house empty and continue their daily routines without being afraid that someone might break into them. Crime itself as a witnessed percentage slightly increased after the project. Street fights and discomfort from the increase in external foot traffic became

unintended consequences. These results emphasize the centrality of communities in urban development initiatives and the possible disparities between designers’ goals and safety experienced by the inhabitants.

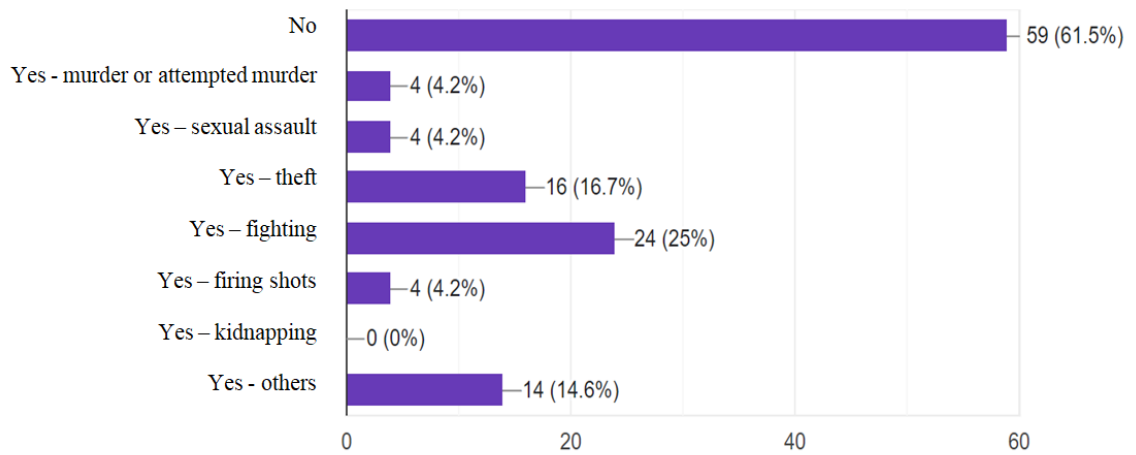


Figure 28 Witnessed crime before the boulevard

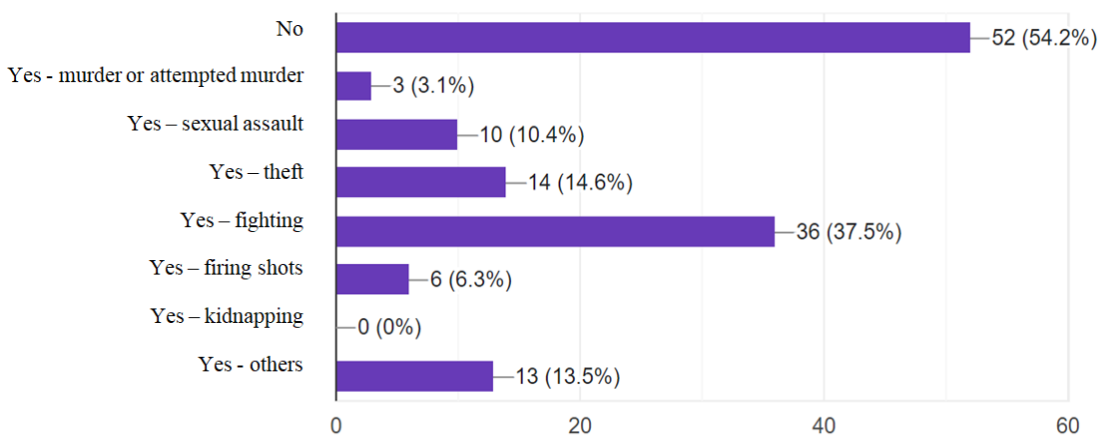


Figure 29 Witnessed crimes after the boulevard

The highest number of witnessed crimes before the boulevard was (25%) for fighting to be increased after the boulevard for (37.5%). Witnessed sexual assaults as well were increased from (4.2%) to (10.4%). In general, as discussed before, percentages have increased but from the above “Feeling safe” section people felt more safe after the project anyway. A possible explanation to those numbers is discussed in the discussion part in-depth.

On the contrary of how the survey was expected to go looking to previous answers, people had more trust issues in strangers who came to the neighborhood after the project and the majority were more likely to help strangers before the project but not after it,

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	68	70.8	70.8	70.8
	no	28	29.2	29.2	100.0
	Total	96	100.0	100.0	

Table 13: Helping strangers before

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	60.4	60.4	60.4
	no	38	39.6	39.6	100.0
	Total	96	100.0	100.0	

Table 14: Helping strangers after

Pair: If a stranger asked for help in the neighborhood before the Boulevard project was built, would you help him - If a stranger asked for help in the neighborhood after the Boulevard project was built, would you help him

Mean	Std. Deviation	Paired Differences			Significance	
		Std. Error Mean	95% Confidence Interval of the Difference		One-Sided p	Two-Sided p
			Lower	Upper		
.104	.447	.046	.014	.195	.012	.025

Table 15: Helping strangers - Paired Sample T

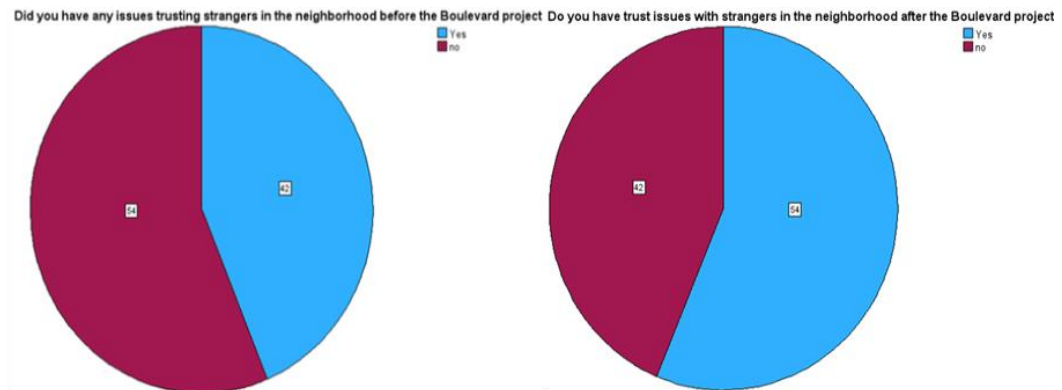


Figure 30 Trust issues Before-After

then noticed an increase in the number of people who said that they would feel safest answering from behind the door after the boulevard, and that supports our main research question where people are having more perceived safety after the project. The reported decrease in the willingness to help strangers and the preference for answering from behind closed doors after the project may be related to increased awareness of safety concerns. The community might be adopting a more cautious approach due to changes in the neighborhood environment. As trust in strangers may have decreased, the reported rise in feeling safest behind closed doors represents that the residents are looking for the security they can create on their own, such as inside their home or their environment. As discussed in the eyes on the street in the literature review, people shouldn't only "know" each other but they should also "care." That explains why people might not trust each other because they don't "care" about each other.

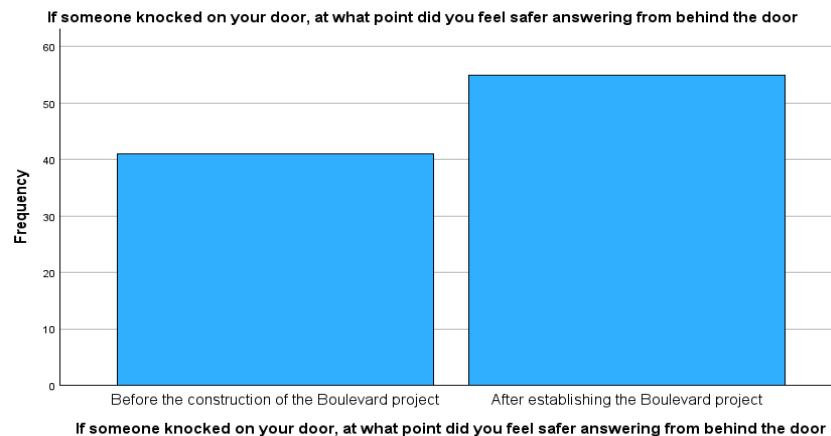


Figure 31 Answering from behind the door

One of our main findings was that people are less trusting strangers after the project but express increased trust in the police. This can be explained because the arrival of strangers in the neighborhood after the project has altered the community dynamics. Residents might perceive these newcomers as unfamiliar and potentially associated with the observed increase in trust issues. The heightened trust in the police could be linked to their perceived effectiveness in ensuring safety. Trust in the police can be influenced by their effectiveness in addressing community concerns. If the police are seen as responsive and actively addressing safety issues arising from the project, residents may develop greater confidence in law enforcement.

Sound Pollution

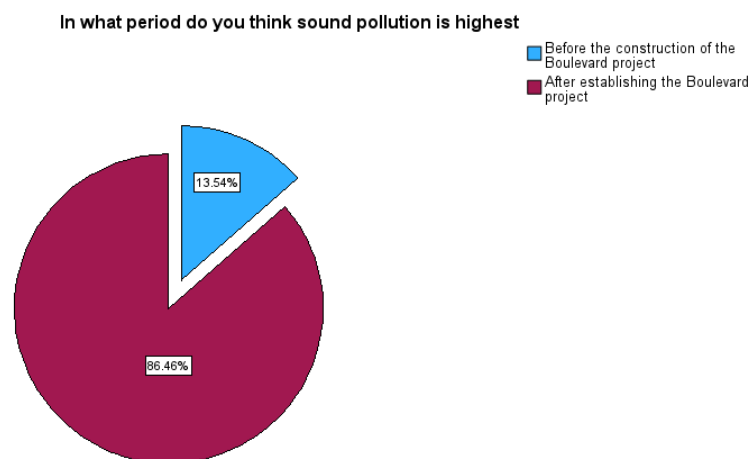


Figure 32 Sound Pollution

Following the literature review, high sound pollution leads to an increase in violent crime. We may argue that the increase in residents' perceived safety in the neighborhood is due to a lot of factors, starting with better community bonds that happened after the project and the sense of belonging as well, which can take out the negative impact of external stressors, including sound pollution. If residents feel connected and supported by their neighbors, this sense of community may contribute to an overall feeling of safety, especially if they feel that they "belong." Also, people over time, may get used to high levels of sound pollution, which in turn lowers the possibility of being perceived as a threat. In this adaptation, the residents could feel

more comfortable in their environments, which would seem to be otherwise high in sound pollution.

Neighborhoods with high sound pollution might offer compensatory amenities that enhance residents' overall quality of life. Access to parks, recreational areas, or cultural activities could outweigh the negative effects of sound pollution, contributing to a perception of safety.

CHAPTER FOUR

4. DISCUSSION

This study sheds more light on the relationship between urban development projects, the built environment, and residents' perceptions of safety, which is a complex relationship that requires careful analysis. The research aimed to analyze the impact of the Boulevard project in Amman on residents' feelings of safety. It was specifically focused on the application of Crime Prevention Through Environmental Design (CPTED) principles, particularly those of the second generation emphasizing community participation and social cohesion.

Respondents indicated that community cohesion was stronger after the project, emphasizing a sense of familiarity and shared identity among residents in the period before the project compared to the period after it when a lot of foreigners were coming to the area. Still, at the same time, they felt more safe after the Boulevard project. Most of these feelings came from the existence of police and CCTV cameras, as the questionnaire showed. The application of CPTED principles helped create a safe environment, as Boulevard residents felt more secure with improvements to the sidewalks, lighting, street designs, and CCTV cameras. These changes actually made the area safer and more pleasant to hang out in. The construction of attractively designed sidewalks has really helped people to walk freely and has also made the place look more lively and vibrant with various social activities happening on them. By creating a pedestrian-friendly infrastructure, people tend to underestimate the importance of surveillance, which is a vital element in the implementation of CPTED principles. Lighting plays a very important role in how safe people feel. Adequate lighting has far-reaching benefits; it discourages crime and instills a sense of openness in the environment. Well-lit areas make people feel safer, as seeing what is happening around you is important for both past and current CPTED beliefs.

Additionally, the strategic positioning of security cameras acted as a visible deterrent to criminal activity, supporting the notion of surveillance as a natural deterrent. Surveillance technology can discourage people from doing illegal things

because it makes them feel like they are being watched and makes the environment safer. Community members agree with that.

People felt more safe after the boulevard project despite the increase in the witnessed crimes rates. This could be explained according to CPTED principles as following:

1. Increased Surveillance: The construction of the boulevard might have resulted in increased natural surveillance. More people using the area, combined with improved lighting and visibility, can deter criminal activity as potential wrongdoers are less likely to go unnoticed.

2. Improved Lighting: The boulevard project included better lighting design, it have contributed significantly to increased feelings of safety . Well-lit areas tend to discourage criminal activities and make people feel more secure.

3. Enhanced Community Spaces: The boulevard project includes public spaces, parks, and gathering areas, and that have fostered a sense of community. Strong community ties and positive social activities can contribute to a safer environment.

4. Clear Design and Accessibility: CPTED principles emphasize clear and accessible design. The boulevard project have improved the layout of the area, making it less conducive to criminal activities and providing easy access for law enforcement.

5. Crime Displacement: Sometimes, when an area undergoes revitalization or improvement, criminal activities may be displaced to other locations. While this isn't a solution to crime, it can create the perception of reduced crime in the immediate surrounding areas.

6. Police Presence and Partnerships: The boulevard project have encouraged increased police presence and maybe partnerships with community policing initiatives as well, leading to a more secure environment.

It's important to consider the multifaceted nature of safety perceptions and recognize that various factors beyond crime rates can influence how people feel

about their surroundings. In our study, it seems that the positive impact of the boulevard project on CPTED principles played a crucial role in shaping a safer environment in the eyes of the community.

People in the neighborhood are increasingly troubled by a rise in violent crimes or international crime, such as fights and even murders. What catches their attention is that a considerable number of these crimes involve individuals who aren't part of the local community. This unease is reflected in residents feeling afraid about going out alone, with a belief that the crime that is happening in the neighborhood is primarily attributed to outsiders. Therefore, there's a growing sense that the neighborhood's safety has been compromised due to the perceived influence of external individuals, making it challenging for locals to feel at ease within their own community.

The implementation of CPTED principles in an urban project led to an improvement in both safety and the city's appearance. But a major question here is: did the developers and designers take that into account, or was it just a coincidence? Because, as we discussed before, the majority of people felt safe because of the existence of police and CCTV cameras. So maybe CPTED was not thought about, as we see that people didn't change "socially" and their sense of the neighborhood didn't have a major shift in their way of thinking. This research highlights the importance of considering both physical and social components when it comes to security. By doing so, it establishes CPTED as an effective approach to creating public spaces that are not only pleasing to the eye but also promote a genuine sense of community and safety for all inhabitants. Although talking about physical aspects and the built environment itself, the questionnaire was not clear in some parts. Future studies should include more site visits and interviews with the residents to have a better understanding of how people think about their built environment in its physical aspect.

Various researchers have contributed to the field of Crime Prevention Through Environmental Design (CPTED), each offering valuable insights while also facing critiques or limitations. Eyes on the street theory (Jacobs, 1961) focuses on the physical appearance where in today's world where everybody is engaged online

rather than in-person, the lack of physical appearance is less. Oscar Newman's work in 1972 lacked a clear theoretical connection between the built environment and social behavior. Norbert Elias suggested in 1939 that integrating his theory with Newman's could empower communities to manage their neighborhoods better. Shaw and McKay, in 1972, were criticized for overly emphasizing structural factors in crime while overlooking individual agency and cultural influences. Ronald V. Clarke, in 1980, overlooked broader social and structural determinants of crime. Wilson and Kelling, in 1982, were noted for focusing solely on visible signs of disorder, potentially neglecting deeper-rooted societal issues like poverty and inequality. Lastly, Timothy Crowe's 2000 work primarily centered on the second generation of CPTED strategies.

A (criticizing, gap or limitation) tab was added to table (3) that conducted main related researchers to our study. Table (16) shows some of these criticizing.

Reference	Criticizing, gap or limitation
1. Bennetts et al., 2017	The study primarily focuses on the perceptions and feelings of safety and comfort in the urban environment, but it does not provide objective measures of crime rates or actual incidents of crime in the studied area.
2. Israel et al., 2014	The paper does not discuss the limitations of the crime prevention approaches examined or provide a comprehensive analysis of other factors that may contribute to residents' feeling of safety.
3. Zeng et al., 2019	The study acknowledges the limitations of using cross-sectional data, which only provides a snapshot of the relationships between variables at a specific point in time.
4. Abed and Aljibarar, 2023	This study emphasized only the impacts of physical incivility signs on perceived safety. Therefore, it will be necessary to highlight other factors, such as social signs.
5. Sharaf et al., 2023	The results of the questionnaires are from a small sample of random people living in the city.
6. Foster and Giles-Corti, 2008	Many safety ratings are based on judgments about crime and disorder neglecting the emotional side while talking about safety and PA. Also, most papers are based on the international measures of safety.
7. Anderson et al., 2013	The research may not have examined the long-term impact of zoning on crime reduction. It is possible that the impact of zoning changes might diminish over time or be influenced by other factors.
8. Köseoğlu et al., 2022	The results from the study are limited by circumstance, not context-free.
9. Alamoush et al., 2018	The study didn't expand all landscape features. The study area is very small. Not related to crime but related to comfortable feelings only.
10. Shepley et al., 2019	No meta-analysis was conducted in this study.
11. Gibson and Johnson, 2013	There are other factors that affect the evaluation of CPTED framework

12. Cozens, 2008	The concepts of CPTED are only theoretical in some countries and should be brought to the table while designing.
13. Mihinjac and Saville, 2019	The paper proposes theoretical assumptions and propositions for Third-Generation CPTED but does not provide empirical evidence or case studies to support these assumptions
14. Doğrusoy and Zengel, 2017	The paper didn't mention any relation to CPTED.
15. Shcheglova, 2022	A limitation for the empirical study of feelings of safety in the city is that emotional expression (the outward manifestation of emotions) is usually ambiguous and does not always correspond to the experience, so researchers do not have a clear understanding of how to objectively measure the strength of feelings experienced by individual.
16. Rashid et al., 2017	Future study should explore more on the relationship of physical elements and perception according to local criteria and demographic background.
17. Gerçek and Güven, 2021	The study may not have considered all relevant factors that contribute to perceived safety in urban neighborhoods. For example, socio-economic status, community cohesion, or cultural factors could play a significant role.
18. Furr et al., 2005	The research didn't control victimization's relation to perceived safety and fear of crime. Data didn't study the socio-economic status. The size of the FSU sample is small compared to the Louisville metro sample and non-random.
19. Zani et al., 2001	Findings from a specific urban environment may not be generalizable to other urban settings or rural areas. The study's location may limit the external validity of its results.
20. Bromley and Stacey, 2012	The limitations of parental influence and the variable of "return home time" in relation to children's fears are mentioned, but no consistent associations are found. Rely on the literature on fear and perception relating to adults.
21. Salehi, 2012	The paper generalized the findings as possible policies.
22. Özhancı et al., 2014	Safety perceptions can be influenced by specific contextual factors such as time of day, weather conditions, and local events. The paper may acknowledge that the study's findings are context-specific and may not be applicable in different situations.
23. Šoltés et al., 2021	Solutions provided might only work in campus scale.
24. Thani et al., 2016	The paper does not provide information on the sample size or demographics of the participants, which could affect the validity and representativeness of the results.
25. Lee et al., 2016	The respondents from CPTED neighborhoods tended to be older than their counterparts from non-CPTED neighborhoods. The research focused on the walking and neglected the car ownership.
26. Iqbal and Ceccato, 2016	It is difficult "to keep an eye" on a public park. CPTED does not give guidance for dealing with the park and its relation to the environment
27. De Biasi, 2017	Students represent a select group that is not representative of the general population
28. Landman,	The paper does not provide a comprehensive analysis of the

2009	effectiveness of the different approaches to crime prevention in the built environment.
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Table 16: Criticizing or gap of the dicussed researches in the literature review.

CONCLUSION

Our research findings explored several key aspects related to social cohesion, community involvement, feelings of safety, changes in the built environment, walking patterns, fear of crime, trust issues, and sound pollution.

Regarding social cohesion, our study found that while the project aimed to enhance community cohesion, residents actually felt a stronger sense of community before the project. Additionally, despite the project's focus on promoting community participation, a significant portion of residents did not engage in volunteer work, suggesting potential limitations in community involvement.

Feelings of safety were attributed to increased police presence and surveillance cameras, indicating a reliance on external security measures rather than community cohesion. However, the transformation of the physical environment, including improved street lighting and open spaces, also contributed to residents' enhanced feelings of safety, particularly when walking alone.

While residents reported feeling safer after the project, there was an increase in witnessed crimes, particularly street fights. This contradiction between perceived safety and actual crime highlights the complexity of urban safety dynamics and the need for comprehensive approaches that address both perceptions and realities of safety.

Trust issues in strangers increased after the project, possibly due to the coming of outsiders into the neighborhood. However, trust in the police also rose, suggesting a perceived effectiveness of law enforcement in maintaining safety.

Sound pollution was a significant concern, influencing residents' perceptions of safety. However, the study suggests that strong community bonds and access to common amenities may have decreased the negative effects of sound pollution on residents' overall quality of life and safety perceptions.

The study highlighted the complexity of safety perceptions in the built environment and the need to involve first and second-generation CPTED principles in urban development projects. From the findings, it follows that community

cohesion, involving residents in decision-making processes, and consideration of the societal implications of architectural changes should ensure a safer and more sustainable neighborhood. However, our respondents were not involved in the decision-making of the neighborhood, which makes the second generation of CPTED weak, and that might be one of the reasons why the ratios between both periods are approximate in terms of social cohesion and community involvement. The current study offers important preliminary results, but it would be more informative to increase the sample size and broaden the research design, which could strengthen the study's reliability and help uncover deeper safety perception dynamics in transformed urban environments, as we would like to know in the future if the implementation of CPTED's second generation would reduce the crime rates in the neighborhood if they were implemented correctly and make the community more involved in decision-making.

Finally, a mix of qualitative methods with the quantitative method that was carried out is a good way to have better results in the future, as observations of the neighborhood itself are changing year by year and the perception of residents' feelings are changing with it. A proposed study about "Perceptions of Safety in High-Noise Neighborhoods" could be effective, as the literature review and previous studies linked high-noise and sound-polluted neighborhoods with violent crime. Still, in our study, people witnessed an increase in sound pollution but felt safer at the same time. Also, a study in a neighborhood that doesn't have a constant police presence might be a better way to understand how the built environment can interact with people to prevent crime and get other perspectives on perceived safety. By doing that, respondents might not have to answer while thinking of police, and they might start to think about the real "issue" in their area.

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APPENDICES

QUESTIONNAIRE QUESTIONS

1. Age
2. Gender
3. Working status (working, not working)
4. Did you feel safe in the neighborhood before the boulevard project? ALL
5. Do you feel safe in the neighborhood after the boulevard project? If yes, can you specify why? ALL
6. In which period are the streets well-lit? 1,3, 4
7. Did you use to walk alone before the boulevard project? 1,3, 4
8. Do you walk alone after the boulevard project? 1,3, 4
9. Did you fear going out alone before the boulevard project? If yes, specify.(options) 1,3, 4
10. Do you fear going out alone after the boulevard project? If yes, specify.(options) 1,3, 4
11. In which period do you think your house is more save if you have to leave it empty? 1,7
12. Have you noticed any crime before the boulevard project? G
A: Yes, No
13. Have you noticed any crime after the boulevard project? If yes, specify G
A: No
A: Yes (fighting, murder or attempted murder, criminal theft, car theft, firing gunshots, kidnapping, sexual abuse, others)
14. Did you have trust issues in strange people in the neighborhood before the boulevard project? 7
A: Yes, No
15. Do you have trust issues in strange people in the neighborhood after the boulevard project? 7
A: Yes, No
16. In which period you can answer questions from the door more safely?
17. If a stranger asks for help in the neighborhood before the boulevard project, do you help him/her? 7
18. If a stranger asks for help in the neighborhood after the boulevard project, do you help him/her? 7
19. In which period you think that the sound pollution is higher? NEW
20. Did you use to listen to music while walking before the boulevard project ?
NEW
21. Do you listen to music while walking after the boulevard project ? NEW

22. Did living in this neighborhood give you a sense of community before the boulevard project? 7
A: Yes, No
23. Living in this neighborhood gives you a sense of community especially after the boulevard project? 7
A: Yes, No
24. Did you go to any community center or social gathering in the neighborhood before the boulevard project? 7
25. Do you go to any community center or social gathering in the neighborhood after the boulevard project? 7
26. In which period do you think the social cohesion and the connectivity of the neighborhood is higher? 7
27. Do you do volunteer work in the neighborhood -Likert scale- 7
A: Once every few years, once a year, once every 6 months, once every month, multiple times a month.
28. Do you think that living in your area is getting better after the boulevard project? -Likert scale- 7
A: Strongly agree, Agree, Same, Disagree, Strongly disagree
29. Given the opportunity, are you thinking of moving out of the neighborhood because of the community after the boulevard project? 7
A: Strongly want to, want to, didn't think about it, I like my community

Keys to the questionnaire:

- 1: Natural Surveillance.
- 2: Territorial Reinforcement
- 3: Access Control
- 4: Maintenance and Management
- 5: Target Hardening
- 6: Image and Design
- 7: Community Involvement (Activity Support)
- G: General Question

If the question is written next to it (1), that means that it is more connected to natural surveillance than other principles, but that doesn't mean that it's only

connected to natural surveillance. In some cases, it is only related to one of the principles of CPTED , or it could be a general question (g).