



Contents lists available at ScienceDirect

Ain Shams Engineering Journal

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Architectural Engineering

## Use All Generation of Crime Prevention through Environmental Design (CPTED) for Design urban Historical Fabric (Case Study: The central area of Tehran Metropolis, Eastern Oudlajan)

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## ARTICLE INFO

## Article history:

Received 6 September 2019

Revised 29 October 2019

Accepted 6 November 2019

Available online xxxxx

## Keywords:

CPTED

Historical context

Social stability

Crime prevention

Urban planning

Tehran

## ABSTRACT

In recent years a new approach has been developed to control and evaluate urban construction. Investigation of spatial engineering factors and their effects on decreasing urbanization values, effects of spaces on the crime rate increase is a new approach to urban construction, management, and planning. Therefore, using of Crime Prevention "Through Environmental Design" (CPTED) focuses on urban design. And it always follows the principles of anti-crime in places. This article examined the first and second generation of CPTED, and developed a third-generation one. Then, tried to look at spatial aspects and factors, show the effects of urban space on the severity of the occurrence and then hide the crime. The results show that, within the historical range of Oudlajan, the high volume of textile problems, and large numbers of crime, are hidden in the backdrop of many historic buildings. This paper has been compiled by descriptive-analytic method and gathered data and questionnaires. Simultaneous study of the first and second generation of CPTED and comparing them with the status of the metropolitan tissue of Tehran (central core) led us to describe the production of the third type. Finally, the recognition and information were obtained from this historical context and historical context approach, we arrived at a graph and strategic map for this region. Based on the localized CPTED (type 3), the general view is that the process should move towards modifying the whole tissue structure. Because this range acts as the central core and the pole. The results show that buildings with religious activity and similar themes have not moved along with rebuilding or retrofitting processes. And the weakness of location-based factors has heightened crime rates and increased resident dissatisfaction.

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## 1. Introduction

The historical context of cities needs to be attention in order to complete its life-system, after neglecting in recent times, because of the changing modes of life, change in the needs of residents according to the patterns created, injuries (sometimes irreparable)

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Peer review under responsibility of Ain Shams University.



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to historical textures and its values have been forgotten. According to Kevin Lynch, the city must create a community of identity and urban identity and human links with the environment for human beings [22]. Historical city with a hundred-year-old city system, which had reached a dynamic balance, generally lost their structural, economic, and social system due to the lack of attention and exodus of the main inhabitants, they were forgotten and the body was severely damaged, its historical structures have been transformed, its original and cultural links have been forgotten, and the historic city, known as the historic texture, than has been renamed the worn-out texture, and its value has diminished, due to the migration of the poor and the immigrants and Destructions that took place over time turned into delinquent places.

In Oudlajan historical texture which is located in the center of Tehran, with every natural or social incidence, an environmental

<https://doi.org/10.1016/j.asej.2019.11.003>

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Please cite this article as: M. Arabi, T. Saberi Naseri and R. Jahdi, Use All Generation of Crime Prevention through Environmental Design (CPTED) for Design urban Historical Fabric (Case Study: The central area of Tehran Metropolis, Eastern Oudlajan), Ain Shams Engineering Journal, <https://doi.org/10.1016/j.asej.2019.11.003>

crisis emerges inevitably. These factors, although hidden within the texture (social and physical), will arise in cases of humane or natural incidences. For instance, in cases of massive fires occurrence (human factor) this region will undergo the highest casualties; so will it in cases of the earthquake as a natural factor. Thus, this issue serves as an incentive to protect this texture since the texture suffers both physically and conceptually. Due to lack of attention, changes in the social texture (migration of the main inhabitants) and massive destructions, the texture does not have proper security. The presence of addicts and motorcyclists throughout the texture has created unfavorable social conditions. The texture itself is susceptible to criminals due to its impermeability and destruction. This has accelerated residents' outflow and texture destruction. This article seeks to provide residents with a sense of security, peace and belonging using CPTED process. This leads to society reinforcement which is among the prominent processes for living and revitalizing the historical texture.

### 1.1. Research questions

How can social security and stability be reached by employing CPTED?

Can historical texture protection movements be pursued by employing CPTED?

### 1.2. Main hypothesis

It seems that through increasing social security (CPTED) and socializing the environment and increasing the sense of belonging of the residents to the environment social stability is achieved.

One of the effective factors in preserving the historical texture is creating environmental security and equanimity among residents and also a sense of belonging all of which being possible using of CPTED.

### 1.3. Objectives of the study

- This paper follows a General Purpose and several dedicated purposes
- The chief aim of this paper is composition, comparison, and using the majority of CPTED generations for conserving the historic fabric.

Its specific objectives can be mentioned as follows:

- Examine the different features and generations of CPTED and its factors to find the best way to planning and building security
- Examine the properties of CPTED for designing and planning and creating a pattern for the case study.

### 1.4. Background research

The first time urban renewal can be seen in the late 19th century, the birth of the industrial city and industrial societies. In this sense, the Hausman intervention in Paris in the 1840s is considered as a type of urban regeneration or urban resuscitation; however, until the end of the World War II, urban renewal cannot be used as a normal urban development tool talked. Physical interventions such as "Hausman" only eventually occurred in the late 19th century - sparse-in most of the capital cities in Europe - and more to the symbolic modernization of cities than to rebuild [16].

In 1945, many European cities were destroyed by World War II, and urban regeneration was one of the main tasks of urban planners [9]. Post-World War II policies were followed by the 1950s of rebuilding, the 1960s urban resuscitation, the 1970s renovation,

the 1980s development, and the 1990s recreation, [17], since 2000, it has been accompanied by a city renaissance associated with concepts such as sustainability, participation of the people and local government, and the creation of social mix [32].

For the first time in the 1960s, the CPTED<sup>1</sup> theory in America was formed. Jane Jacobs has published the created security through environmental design in his book. Jacobs [18] but for the first time, the term use of environmental design to prevent crime was published by Ray Jeffrey in 1970 and published a new theory based on the relationship between the environment and man. His purpose is to reduce the chance for crime through designs that provide both physical and psychological aspects simultaneously through the design of the environment (Jeffrey, 1970). At the same time, Newman's Oscars book, entitled "Defensible Space", was Published and will pay three major factors in increasing crime rates: lack of understanding of residents, lack of environmental monitoring, and access to escape routes [27]. In the 1980s, George Keeling and Wilson and Paul Rattingham in the Urban Criminology study on the theory of broken windows and the reduction of the crime potential of urban areas, pointing to the disadvantages of designing an artificial environment. In the 1990s and 2000s, The Crowe team and responsible for CPTED training programs in crime prevention through environmental design on the strategy of this approach and held international conferences and congress in this regard [21]. In the new urbanization, the reduction of crime is meant to enhance the social interaction of the street, the ability to walk and increase the possibility of monitoring the environment, which promotes a stronger sense of belonging and life of the community.

The research in design with the CPTED approach in different areas, such as Iran's Qom Women's Park or urban planning with CPTED for the Golabdreh District in the 1st District of Tehran Municipality, and even a title for Arab countries such as the United Arab Emirates and for countries like Canada and even neighborhoods in Amsterdam is also considered. The purpose of the present study is to use the two generations of CPTED to give a strategic plan in a historical texture.

### 1.5. Literature review

Jacobs [18], She posited that dynamic and safe neighborhoods are places which provide and encourage social relationship and mutual support through the mix of uses and the provision of sidewalks.

Angel [1] It mentioned how citizens can play an active role in preventing crime.

Jeffery [19], The first one who Used CPTED, and also he emphasized on Urban planning and Urban Structures designing and neighborhood units for controlling and preventing the crime.

Newman [27], concept, which includes elements of a theory of crime in addition to a set of urban design principles.

Gardiner [15] Explains about the direct relationship between crime and the structure of neighborhood design, He claimed that urban design contributes to mitigating the crime opportunities.

Poyener [30], it is about how Crime can be decreased by designing.

Saville and Clevend [34] they mentioned the Second generation of CPTED which included the social factor.

Crowe [7] argues about the factors of the CPTED and it can be effective in reducing recorded crime. CPTED is self-evident which has been used for many centuries.

Plaster Carter [28] that was about the next generation and active community.

<sup>1</sup> Crime prevention through environmental design.

Cozens et al. [5] express both generations of the CPTED and their factors.

Minery et al. [24] argues about the CPTED factors and two residential areas of Australia was discussed.

Cozens [6], discussed redesigning the city and investigated about the crime and fear of it and using CPTED.

Fisher et al. [13] investigated in a case study of multi-agency collaboration in Sydney, during the interview, the follows the objective: (1) Physical environmental design (2) implementing measures that change the negative aspect of the physical and social perspective. (3) Maintain the positive features of the physical and social landscape. It was necessary for their successful implementation between different groups and the need for cooperation. The results show that using CPTED is effective and socially useful. In the case study, prevention has taken place or no analytical research has been performed, however, investigates the degree of use and understanding of knowledge by each of the individuals in opposite roles. The study showed that CPTED is far more defensible in such an effort to prevent delinquency, to increase monitoring and promote space. In recent research, orientations and contexts have varied. We review three examples of different ways to use CPTED:

Fleissner et al. [14] studied CPTED and emphasizing the role of the police and local residents, it is imperative for the police to cooperate with the citizen (to improve the high-risk areas), as well as with the city's architects and planners (to review their plans and plans) to improve the environmental conditions.

Clancey [4] the paper was provided an overview of CPTED and was assessed its development in their case study (New South Wales in Australia).

Piroozfar et al. [29] - studied CPTED and the use of urban design to reduce crime in the area. Also In that, the theory of defensible space, the promotion of the realm of ownership of ownership and distinction between the private and public space and the creation of the second generation of CPTED and the participation of the residents and their responsibilities. The interview and analysis is the main part of this article. The results indicate that the location and time are the most important factor for committing a crime, Interventions such as lighting, building panels, maintenance, territoriality, CCTV, police presence are effective in reducing crime. But certain people live in a particular region, however, they can be reduced by environmental changes, but sometimes it has little effect. The positive results of CPTED in this region can be achieved by creating a sense of positive correlation to the semi-public spaces that were considered to be public spaces by users. In this essay wrote that there is a need for better solutions to adapt the environment in the future.

Mihinjac et al. [25] explained about third-Generation and it was mentioned about the first and second generation and expanded the second generation.

## 2. Methodology and data analysis

This research is descriptive and analytical and its method of study:

- (A) Documents: From books on the history of Tehran, and referring to renovation organizations and the local renovation office and the municipality for information on statistics and figures.
- (B) scaling and Fields: Direct harvest from neighboring units for the preparation of physical maps, user's ...
- (C) Questionnaire: Questions from local people were distributed to age, sex, and social status, and questions about needs and harm, cognition, and texture were asked.

The Swot data hierarchy method is used to analyze the data, as well as were used to the overlap the layers of the urban texture and to buffer them; in addition to swot and hierarchy, we also used the overlay index model in GIS to classify, evaluate, and revive historic buildings.

### 2.1. Design and method of entering the problem:

#### 2.1.1. Definition of two generations of CPTED

In the direction of empowerment and stability of the city's historical texture of the city and the possibility of using the spaces of the historic city and citizens' satisfaction, it is necessary to create a safe and free from crime. Based on the CPTED theory, proper design and effective use of the built environment can be lead to a reduction in the incidence of crime and improve quality of life [7]. Physical environment conditions can also help to commit a crime and can prevent it from happening. For CPTED, there are different definitions. CPTED is an acronym for crime prevention through environmental design which declares That "the proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, and an improvement in the quality of life" [7,5]. The principles of CPTED depend on 3 basic overlapping strategies: "controlling access, rising opportunities for casual surveillance, and promoting a sense of ownership", Environmental strategies designed to mitigate crime and upgrade the quality of life have been applied in diverse settings, including communities, industrial areas, public transportation, and businesses [38].

In the CPTED approach, we face a number of different issues; according to Minerva's research, the physical criteria of space-based crime based on the CPTED approach are shown in the Diagram No1 [24]. One factor is Defensible Space or Territoriality that means space is completely controlled by control access or responsibility of identifiable people. Another one is Surveillance and visibility, residents or passersby can easy easily can overlook the potential crime sites. Legibility and permeability mean a clear designed environment. Some strategies with evidence of target hardening such as neighborhood watch can make security for residents. Robustness can show the stability of that region. And also Land-use mix is appropriate for the neighborhood [24] (Diagram 1). CPTED is A preventative approach is considered strategic in terms of ensuring the prevention of crime through the initial stages of planning trying to eliminate the opportunities for the occurrences of crime. However, crime prevention is indeed a complex issue that relies on the supposition of crime. The modification of physical environmental elements is seen to be able to decrease the possibility of crime happening [40].

what is known as the first generation of CPTED is the Responsible for Crime-Free Spaces, which includes the approach for the second generation of CPTED, which goes beyond physics design and include the social-economic approaches[5]. There are 6 broad characteristics to first-generation CPTED which was cozens mentioned, such as Territoriality (sense of ownership), Surveillance (Informal, natural, Mechanical (cctv), Mechanical (lighting), Control access (informal/natural (e.g. spatial definition), formal/organized (e.g. security personnel) and mechanical (e.g. locks and bolts), Activity Support (Eyes on street, permeability), Image (The significance of the physical condition and image of the built) and the last one is target Hardening (denying o limiting access to a crime) [5] (Diagram 2).

The second generation is based on human factors. People like Cleveland and Saville have suggested CPTED's second generation. In which use four new strategies.

Social cohesion (participation in local and social events, local networks, solve the community issues, conflicts positive and awareness-raising and anti-violence education); Connection (transportation facilities, networks with foreign organizations,

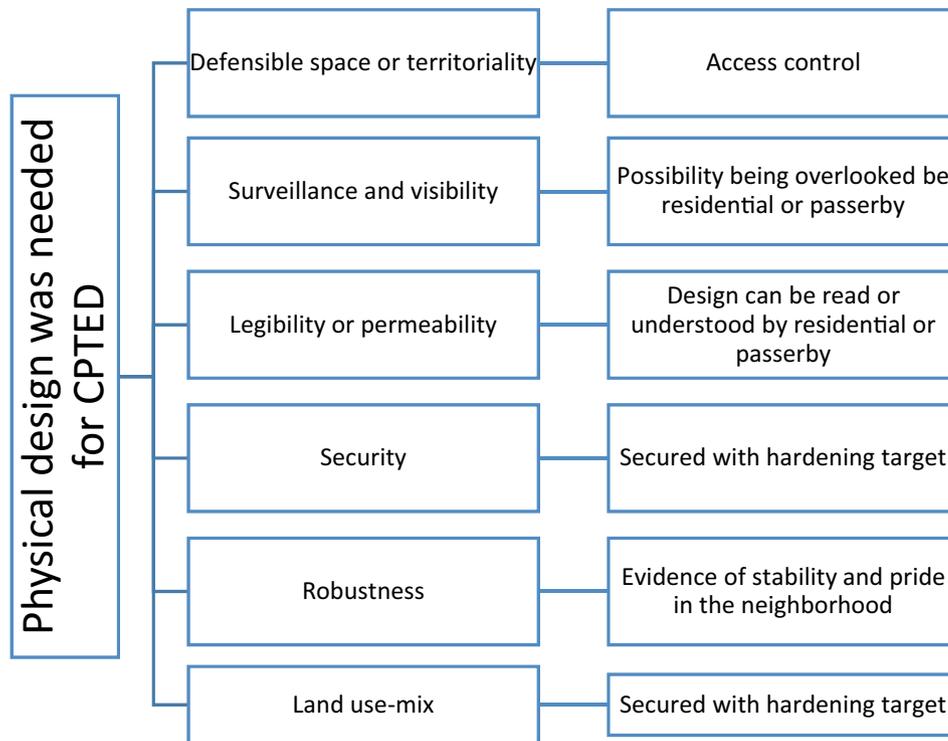


Diagram 1. CPTED Body Metrics Based on Minnery Paper.

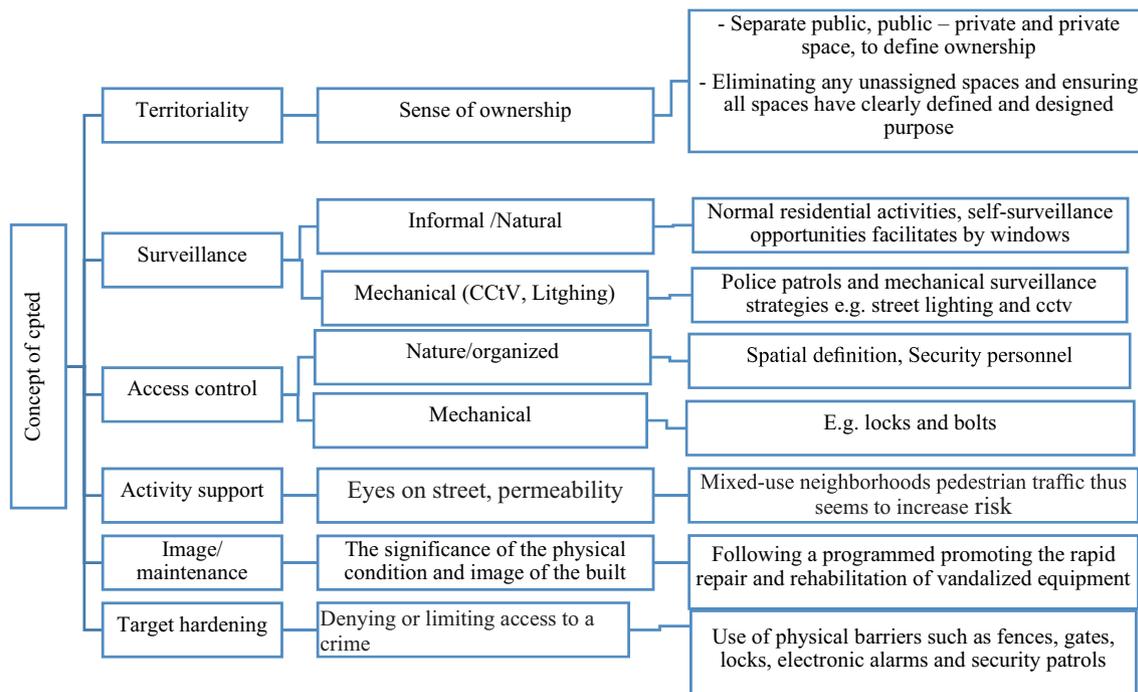


Diagram 2. CPTED Body Metrics Based on Cozens Paper.

granting access to written services); Community culture (sexuality and minority equality strategies, sexuality-based programs, special places, community traditions and cultural activities); And the threshold of capacity (human scale, land use density, maximum diversity, balance in social stabilizers such as street cafes, exhibitions; criminal offenders under the threshold of criticism, such as deprived homes and crime places). This approach is associated with various advances in the new society, including urbanization,

ecology, environmental sustainability, transport developments, and socio-political movements, etc. [34]. The second generation has five power points that include: (1) communication (encouragement in bilateral communication and free dialogue), (2) justice (fair relations between planner and community), (3) local knowledge (new learning method and emergence of knowledge), (4) empowering the community and trusting (effective in recognizing their views and their approach in planning and the final outcome),

and (5) trust and respect (for participation) is an affirmation of the beginning and end of this approach and ultimately leads to solving local problems [8]. One of the other needs of urban life identity, including historical protection and urban restoration, shaping centers, personality, originality and meaning, longevity, art decorations, sense of place [20], each city depends on its identity for its own life.

A city is once a city to reflect culture and lifestyle. Culture and identity come together [37]. Lewis Mumford, with protest modern cities, stated: new buildings and neighborhoods are rigid and orderly limited and with protest to American cities, he says: "These cities lack the personality and identity of architecture and social considerations" [26]. Looking at Diagrams 2 and 3, you can see the following for the physical design of the city.

1. Readable spaces: Possibility of viewing spaces by sidewalks and citizens (e.g., not planting crime plants and Creation the open spaces).
2. Existence of uses: Creating specific uses for each building and no leaving space without uses and ownership (Absence of abandoned spaces) removing or changing peripheral uses and improving the quality of life, Preventing the abandonment of spaces and life for local uses, and creating more local applications for local people, creating mixed user, and giving value to public spaces.
3. Possibility of monitoring: both natural and mechanical: lighting, using hidden cameras in places required, creating spaces and areas with the possibility of natural monitoring, creating living spaces in day and night.
4. Security: With the help of government agencies such as police, guard and...
5. Maintenance, repair, and design: Design spaces for more people, boosting and decorating spaces with urban furniture designing to improve the quality of life of local people, organizing institutional spaces and local infrastructure.
6. Identity: Using elements and architectural and urban patterns for design.
7. The executive institution should coordinate local activities and achieve results, with the help of two organizations (i.e., local government and police). The local government should be responsible for CPTED, urban design, infrastructure, non-drug areas, graphite management, communication with local businesses and social coordination activities, and ...; Police should also provide information on the crime process with local security suppliers Share [3].

Therefore, the task of urbanization is not limited to the standardization of the body of the spaces to enhance the security, psychological factors such as socializing the environment and increasing the sense of belonging to the environment have influenced the factors known as the second generation of CPTED.

## 2.2. CPTED third-generation proposal

As we have seen, CPTED's first generation in the context of physical design for security and the second generation of social discussion requires a social reinforcement to complete the second generation. Social reinforcement and achieving the highest quality of life and social well-being and the need to combine both generations and create and design suitable for urban texture.

### 2.2.1. The need to achieve a sustainable society (social stability)

The term social stability is considered as one of the three dimensions of sustainable development aimed at improving living conditions in the community and its ultimate goal is economic and biological change [12]. In the EU in Lisbon, social stability has

become a model for urban and social development [10]. The main indicators for measuring social stability including are: satisfaction with the place of residence and location of the place; crime rate and divorce; social responsibility; coexistence; "basic needs"; participation in cultural and recreational activities; participation in religious activities; participation in local activities; and unity, social interaction Community involvement; the sense of participation; health and social security; the quality of employment and income; the quality of education, services, housing, and the environment; access to services; the quality of information access; social welfare; (social sustainability); population dynamics; empowerment Participate in religion, national and local programs, participate in a wide-network friendship network with positive relationships. (Social unity), satisfaction with the performance of institutions, satisfaction with the quality of service access, optimism about the future; hope for the future; sense of happiness; "social satisfaction"; urban identity; (social cohesion); equality; compatibility; Social trust in national institutional quality; interpersonal trust; civic or corporate trust; and social justice; social equity; security; avoidance of fear of the spread of social anomalies; "social security" (social trust) [12,23,36]. The above can be divided into three categories in general and several sub-categories: of course, they do not mean the boundaries defined for each. All of the above are interdependent and have an inseparable relationship (Diagram 5).

In the first generation argues about the physical elements and the second generation asserts about the social factors, which are not proper for the historical fabric of oudljan and need more extended, as a result, the third generation using the two previous generations, with their improvement, is equipped for planning the oudlajan context.

## 3. Eastern Oudalajan quarter of Imamzadeh Yahya

Oudlajān is located in the north and northeast of Tehran, and this quarter can be considered a part of Tehran's Old Testament quarter [11]. Oudlajān was one of the four main quarters in the Safavid period and five quarter in the Qajar period. Oudlajān was considered as a local municipality until around 1330 [35]. After the streets in contemporary times, Oudlajān is divided into three parts: Western, Eastern and Central.

The building of Imam Zadeh Yahya was made from clay in the 8th century Ah, due to accidents in 1318 destroyed and was rebuilt. Therefore, it may be said that the adjacent neighborhoods of this building were much older than the Safavid cause, and the presence of these elements was the primary nucleus of the formation of neighborhoods around them [2]. In terms of the skeleton of the passage of Imamzadeh Yahya, there are several historical and main passages such as the passage of the Imamzadeh Yahya, the passage of the Navab, the passage of the Gharaghani Bathroom (Shahid Jamshidi), the passing of Shahid Javidi, the passage of the Shahid Alimoradi. Along these main passages, the main square of the garden Pistachio, and has important historical and religious elements such as Imamzadeh Yahya, Nawab Bathroom, Bek Seminary and Schools, with Historical and Religious Elements Such as Imamzadeh Yahya, Bathroom of Nawab, Seminary and Imam Sadiq School of History, Pistachio Garden (Parvin Eeatesami School), Kazemi House, Khoraghani Bath, Ghavam Dawlah House, Nasir Dawlah House, Modarres House, Imamzadeh Yahya Neighborhood House of Culture, Imamzadeh Sangkhahane.

### 3.1. Comparative comparison

On the Map of 1332, the 15th Khordad was completed and the two Neighborhood of the Oudalajan and Chaleg Maidan was sep-

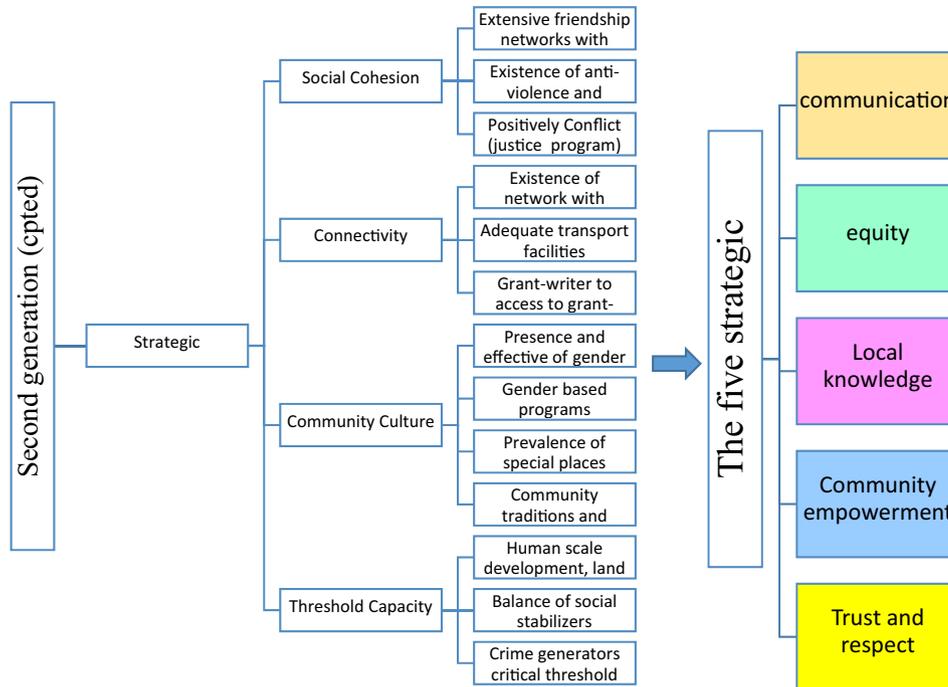


Diagram 3. Second Generation CPTED.

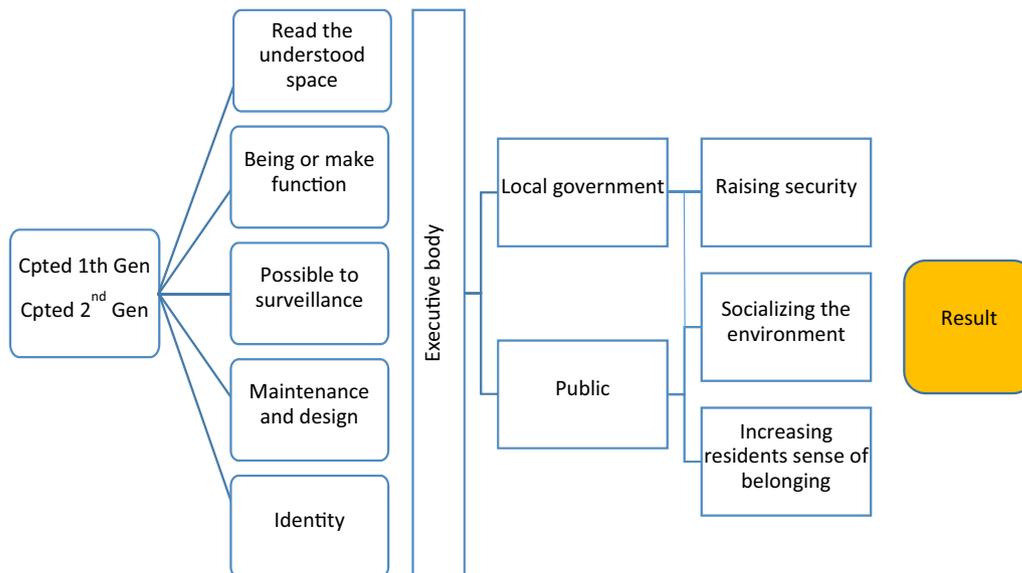


Diagram 4. Exploring the First and Second Generation of CPTED.

arated. It can be said that the most important change in this area, but apart from this, there are several destruction of residential units in this area, which are the most common cases, and even in some alleys there is a retreat. The above photos are old; on Maps 1–4, it has come to a high quality (see Maps 1–4). Compare photos and maps with chronological order, Trends of change, physical growth of the city (horizontal - vertical), changes in the structure of passages and access. Visible in aerial Photos 1–5. The basic pattern of city change is based on the spatial organization of the market (Bazar). The spatial role of Bazar has changed the structure of the passages several times.

### 3.2. Review the existing status of historical texture

Based on a scaling carried out in the historical context, existing status maps were prepared to arrive at an appropriate strategy.

There are 3305 units in eastern of oudlajan This area is 652746 M2, According to the Maps of 5–10, the Table 3 is prepared.

According to the Table 1, which is derived from GPS map analysis, considering the antiquity and high value of the region, only 13 heritage sites have been registered, which is very a low number relative to this historical region. V-1 (less than 1%) Monuments are being destroyed and renovated, a procedure which is becoming

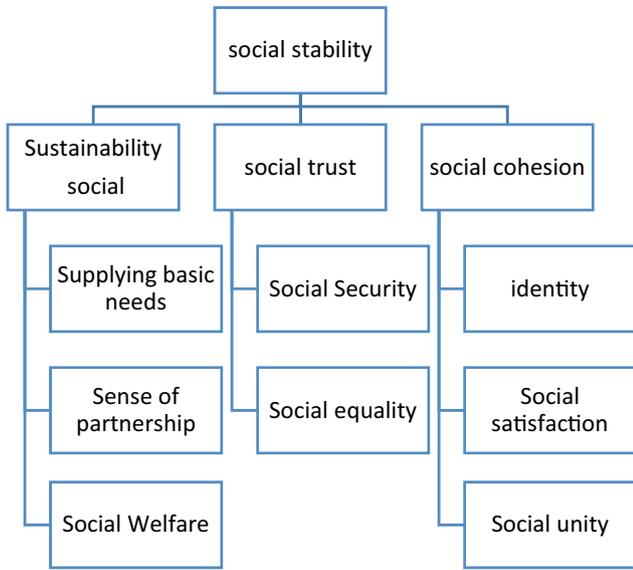
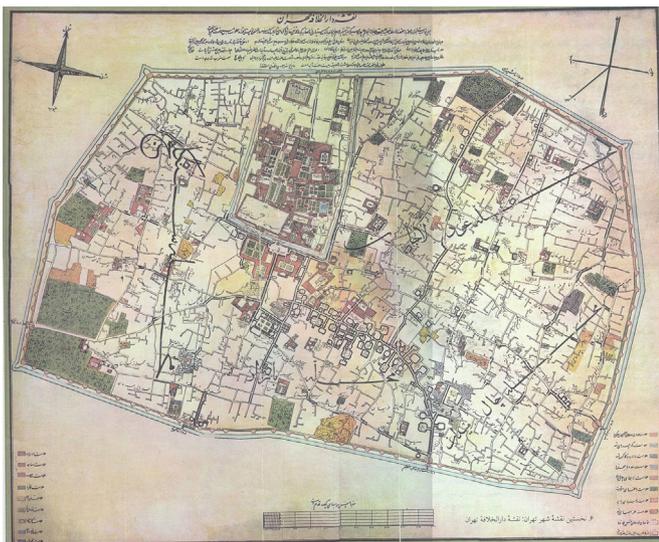


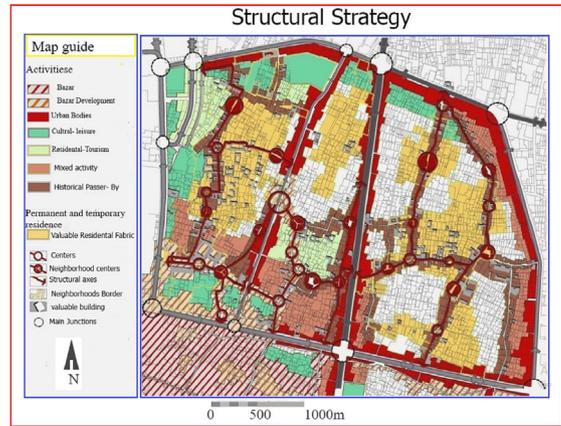
Diagram 5. Social stability for the third generation of CPTED.



Map 1. Creator of the map: Elias Brezin – Created: 1848 – [39].



Map 2. The third Map of Tehran, Mohammad Shah Qajar period (1858) [39].



Map 3. Work- Activity Oudaljan (authors).

so trendy in the area (162 units, 6%). Religious places are quite ubiquitous concerning the texture, and the majority of places will occupy religious applications during especial times such as Moharram or mourning. However, the social application is very dim relative to the area S-1 (less than 1%). Most places are turning into unsuitable applications (such as warehouses and workshops) which currently is G-5 (less than 2%). The local market and commercial areas next to the texture comprise the highest number of units following residential units. F-1 and F-6 (165 and 76 units i.e. 3.57% and 3.35% respectively). The Majority of applications with various activities can be turned into social applications as well (65 units, approximately 2%).

### 3.3. Damages the historical texture of the Oudalajan

The eastern Oudalajan suffered from many damages, the most important of which is the phenomenon of urban decline. The phenomenon of urban decline is, in fact, the concept of spatial focus of environmental, physical, economic and social problems that appear to be high levels of unemployment, poverty and extensive pollution of the environment [31].

For understanding better about the historic fabric problems (such as social and physical) were prepared 220 questioners which were asked local people about these problems.<sup>2,3</sup>

To investigate the problems of historical texture other than evidence, it was necessary to prepare a report from the tissue inhabitants. Residents can be divided into 5 general categories, which are based on Penetrability and presence in the texture.

First Category: Imamzadeh Yahya Counselors and founders: Due to the importance of Imam Zahra Yahya in the neighborhood, it has had a significant impact both religiously and historically.

Second Category: Imamzadeh Yahya custodians and founders: Due to the continued presence in the neighborhood and the pres-

<sup>2</sup> Hosseyneih, Takkeyeh, are the religious places for Muslim Shia in Map no 7.

<sup>3</sup> Questioners: more than 30 classification questions have been asked from 220 of local people (eastern of Oudaljan) for 2 months between 9 to 5 o'clock, By 18 students in 6 teams which divided the areas and did field researching and scanning questions were about different situation of living and urban infrastructures such as (general question for knowing the local people, context problem and benefits, satisfaction, and the living in this area), the researchers were in the texture to ask 3 different categories which found them random. The questions were asked in papers, were analyzed and normalized by excel. Part of the questions is scanned by levels and passages and measured by count. Another part of the questionnaire was completed by referring to the home door and direct inquiries from residents and residents. The diversity and consistency of questions have increased in 2018 and compared to the first period (2012). This has led to more comprehensive information. Therefore, the results of the questionnaire, after several stages of screening and validation, were re-classified to their peer levels. The analyze was done by the professor and his assistant.



Map 4. Route map of important place - East Oudlajan [39].



Photo 4. Aerial photo (1983 mapping organization).



Photo 5. Aerial photo (1995 mapping organization).

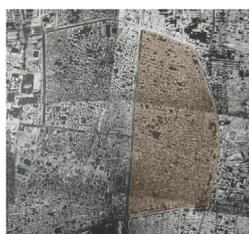


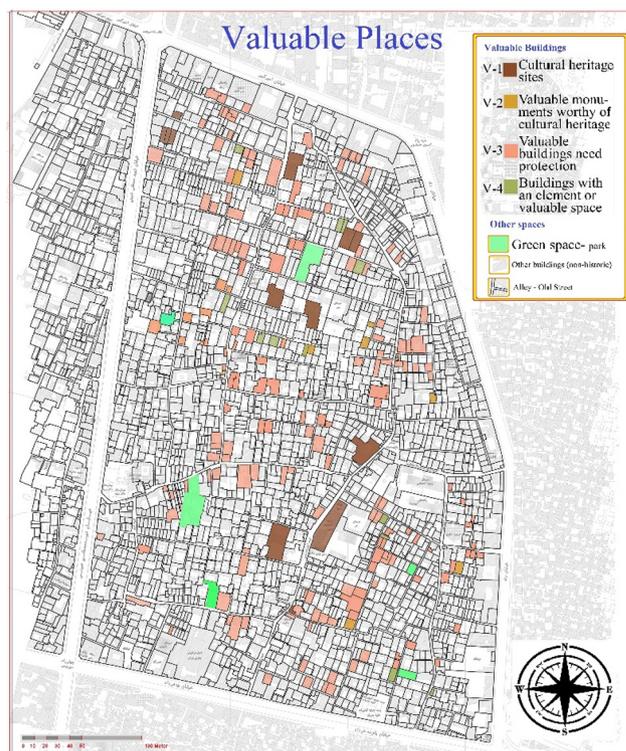
Photo 1. Aerial photo (1940 mapping organization).



Photo 2. Aerial photo (1953 mapping organization).



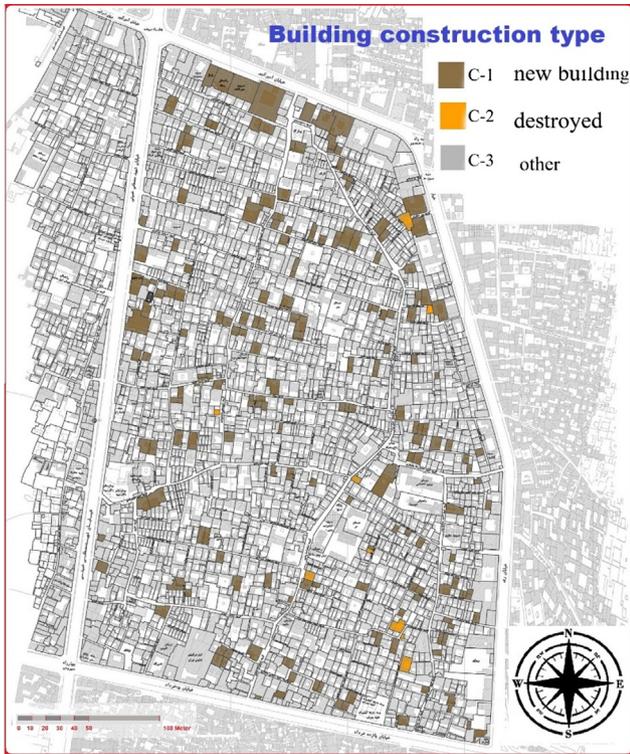
Photo 3. Aerial photo (1966 mapping organization).



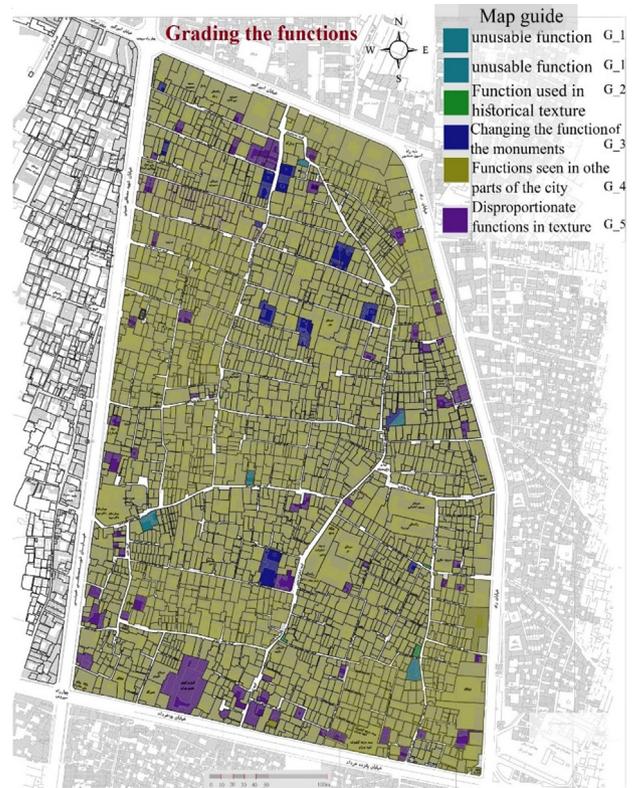
Map 5. Valuable Places (authors).

ence of important social nuclei in this group, the group has problems with neighborhood issues and good knowledge of the neighborhood.

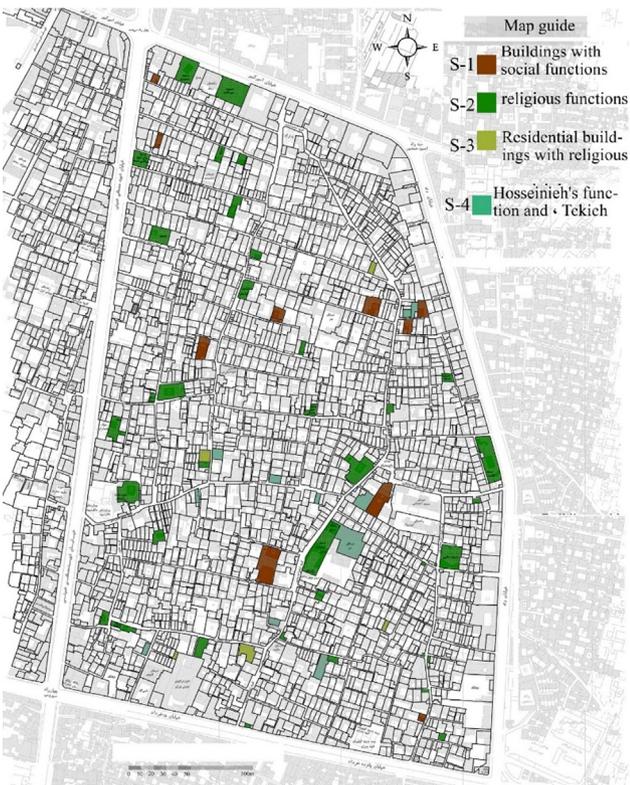
Third category: the women between 18 and 35 years old with high school diploma: Selecting this group of residents for recognizing the status of women in the context and examining problems and opinions. The selection of women between the 18 and 35 years old is due to women engaging in school issues and before of the 18 years old, and after 35 years old, they are involved in family matters. In this case, between of the 18 and 35 years old, there is the most conflict in the tissue. Another condition for having a diploma is that you have a cultural and scientific level to better understand the context of the historical context environment.



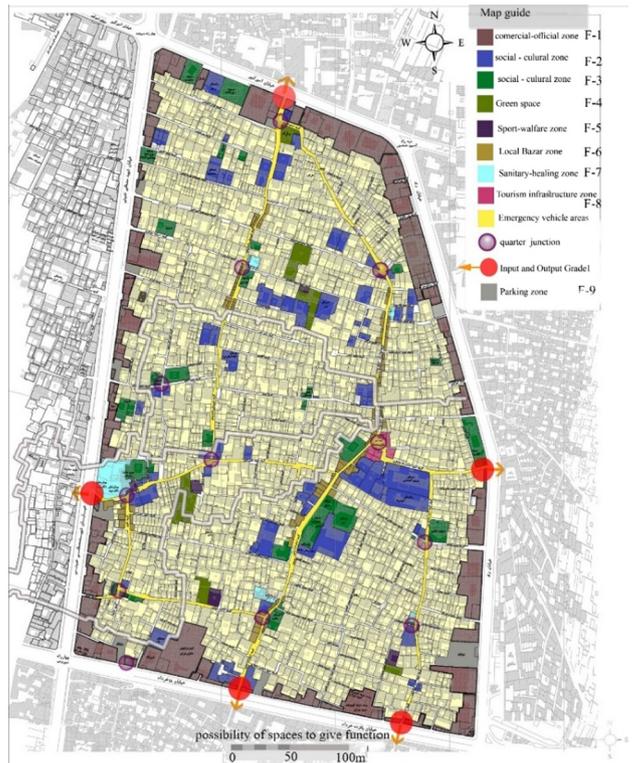
Map 6. Constructions (authors).



Map 8. Grading the functions (authors).



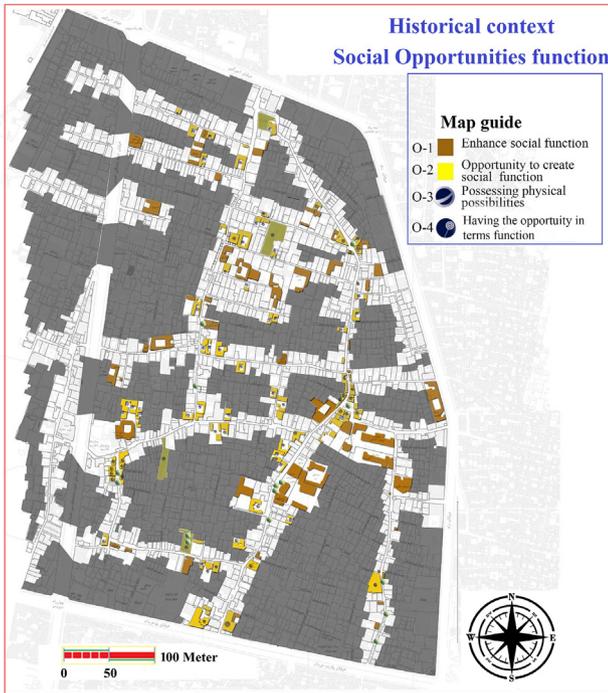
Map 7. Buildings with religious functions (authors).



Map 9. Possibility of spaces to give function (authors).

Fourth category: Residents over 50 years of the living in historical texture. The long-term presence in the historical texture makes it possible to recognize and contrast with the historical texture.

Fifth category: Resident of the tenant and immigrant: The presence of a significant number of these residents in the context of this group prevents the group from being ignored.



Map 10. Historical context Social Opportunities function [39].

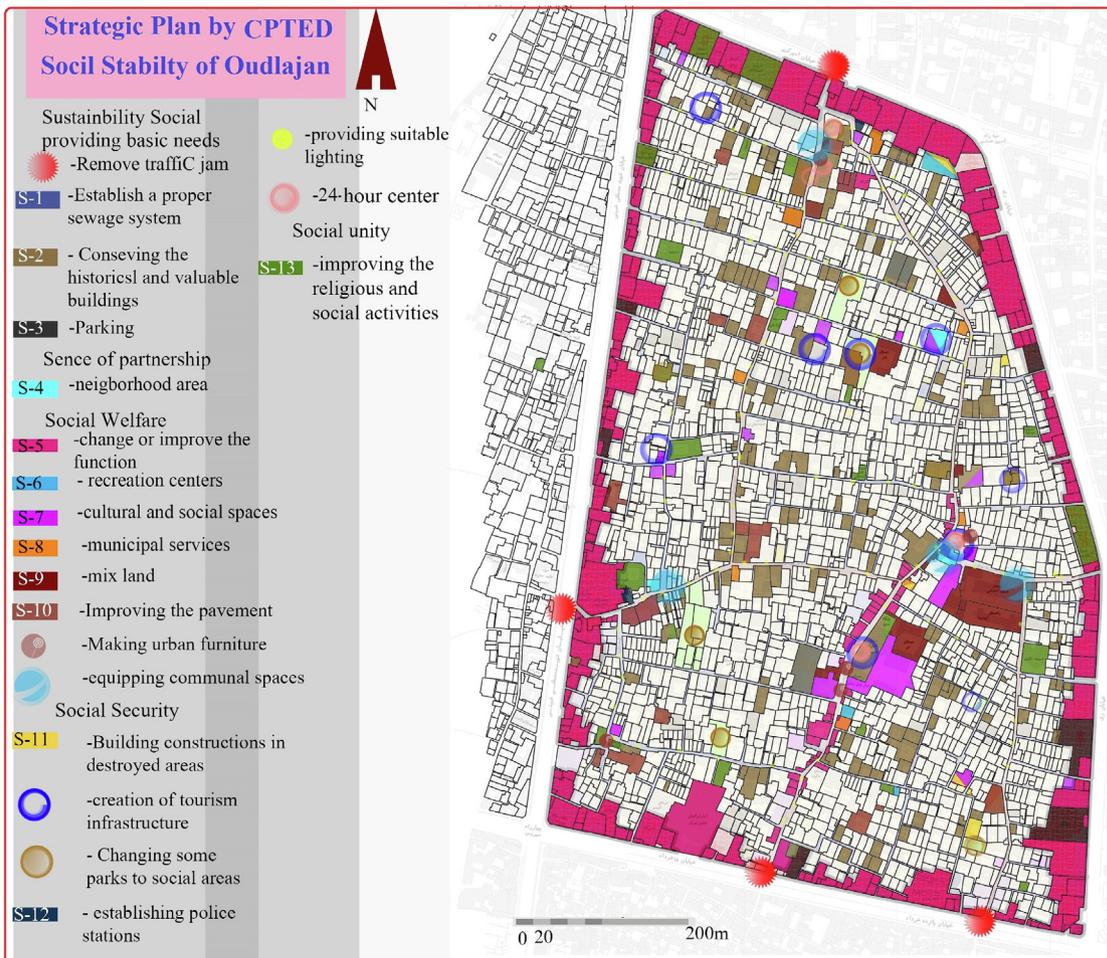
In the Table 4, if we want to classify problems according to residents, 1 is the lowest and 10 is the highest grade and are categorized as follows. (Refer to Table 3)

According to the Table 3 lack of renovation is the biggest problem in the historic texture (27%), Most of the people believe that The presence of addicts and delinquents in the texture is the main social problem, (45%), in terms of commercial subject, Poverty is the chief factor of demolitions in the Oudlajan (57%) another problem is lack of considering by managements to the problems of this historical fabric (36%), transiting some units to store and being garbage in most of the place are the others problem by 54% and 52% respectfully. In addition, insecurity, addicts, garbage and sewage system are the highest grade of the problems for the residential. (Table 4)

#### 4. Social stability for the third generation of CPTED in the historical texture of Eastern Oudlajan

Diagram 6, offers both physical and conceptual plans for the texture. A strategic plan has been developed as its physical plan (Map 11). As evident in this diagram, the following are suggested for its social sustainability:

1. Providing basic needs: Due to the texture's aforementioned problems, its biggest source of damage is municipal waste and sewage. Other than those, issues such as traffic jams and motorcyclists, as well as visual pollution throughout the tex-



Map 11. Strategic plan by CPTED [39].

**Table 1**  
Assessment the Maps 5–10.

<b>Construction-Map 6</b>				
Name	NO	PEER	Area/m <sup>2</sup>	Percentage
C-1	162	8/9%	39,069	5/98%
C-2	9	0/2%	1902	0/29%
C-3	3134	90/9	611,775	93/8%
<b>Grading the functions-Map 8</b>				
G-1	4	0.12%	1296	0/2%
G-2	1	0.09%	110	0/01%
G-3	10	0/24%	2579	0/39%
G-4	3205	97/68%	629,636	96/01%
G-5	85	1/9%	21,704	3/32%
<b>Historical Context opportunities-Map 10</b>				
O-1	38	1/4%	29,956	4/5%
O-2	65	2%	30,307	4/6%
O-3	45	1/3%	18,555	1/2%
O-4	42	1/27%	20,402	3/1%
<b>Valuable place-Map 5</b>				
Name	No	Percentage	Area/m <sup>2</sup>	Percentage
V-1	13	0/3%	3183	0/41%
V-2	6	0/4%	1333	0/2%
V-3	177	5/6%	50,564	7/75%
V-4	11	0/24%	3050	0/46%
<b>Religious and social function-Map 7</b>				
S-1	9	0/27%	2689	0/41%
S-2	31	0/9%	30,061	4/6%
S-3	4	0/15%	2243	0/34%
S-4	10	0/27%	2692	0/41%
<b>The Possibility space for giving Function-Map 9</b>				
F-1	125	3/78%	94,926	14/54%
F-2	67	2/02%	26,016	4%
F-3	21	0/63%	11,590	1/77%
F-4	7	0/21%	10,405	1/59%
F-5	2	0/12%	414	0/06%
F-6	75	2/2%	3608	0/55%
F-7	4	0/09%	5763	0/88%
F-8	4	0/09%	527	0/08%
F-9	7	0/21%	4451	0/68%

ture, parking vehicles inside the texture have extremely perturbed the environment, and by eliminating them, a safe and pleasant atmosphere will be attained.

2. Sense of Participation: Designating spaces to address people's problems and encouraging them to participate in programs and improve neighborhood areas are among the things to be considered. Places like neighborhood houses will be in charge of this matter.
3. Social Welfare: Social welfare consist of various matters; however, depending on the needs of the neighborhood, measurements including altering or eliminating urban functions (removing workshops and warehouses), improving some functions (local markets and service areas), or creating recreation centers (Sports spaces, museums, parks improvement), dedicating spaces for municipal services (banks, post offices, etc.) assigning cultural and social spaces (libraries, neighborhood houses), designating various functions to some areas such as religious areas majority of which lack any function during most days (such as Hussainiya and Takkayas) can be taken.

Other actions that can be taken regarding Oudlajan historical texture welfare include pavements improvement with proper flooring over which vehicles would pass with the least speed possible, and also proper urban furniture designing and manufacture, and facilitating public spaces for the people gatherings and presence (furniture, lighting, etc.).

The following were also considered in order to create social trust in the texture:

1. Providing security: Building constructions in destroyed areas, creating tourism infrastructure (enhancing historical houses' status and neighborhood centers), providing necessary facilities for tourist attractions (restrooms, restaurants), holding social and cultural programs at parks and turning them into social places, establishing police stations in some regions, providing suitable lighting, and changing some centers into 24-h centers.
2. Social equality: Improving urban facilities and raising land prices in the region can serve as a help regarding this issue.

The last issue is social cohesion which can be feasible in Oudlajan historical texture under the following circumstances:

1. Identification: employment of historical texture elements and symbols throughout the texture.
2. Social Satisfaction: which is possible through easy access to urban facilities, utilities, and addressing public problems, as well as providing basic needs throughout the texture.
3. Social Unity: Oudlajan historical texture is almost a religious region. Imamzadeh, Hussainiyas, Takkayas, and mosques all indicate the dominant atmosphere in this texture, which can serve as a potential for creating unity among locals. This trend can be accelerated by highlighting religious activities. Besides,

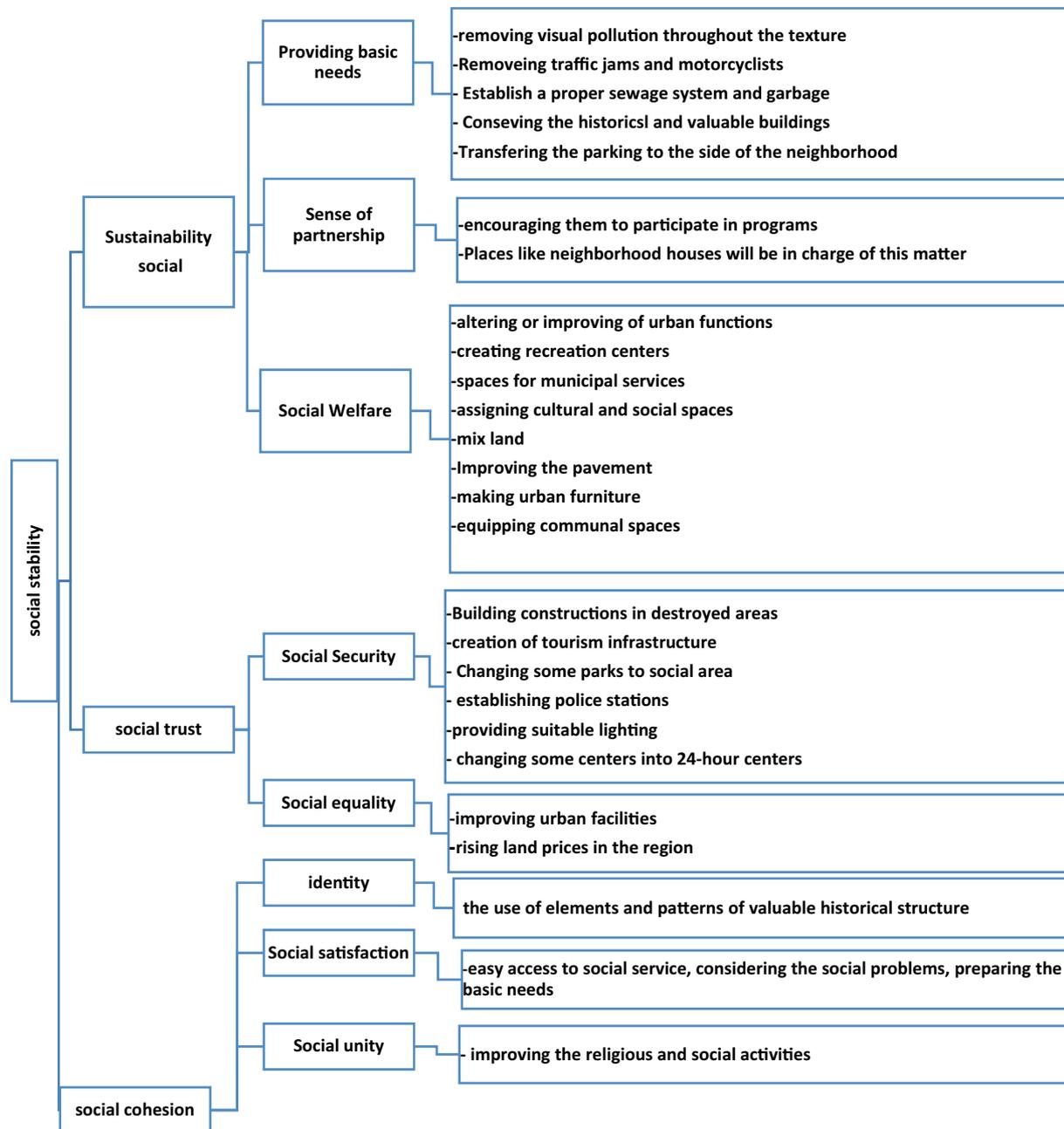


Diagram 6. Social stability for the third generation of CPTED in the historical texture of Eastern Oudlajan.

other social places can also bring people together by promoting some pragmatic plans. According to the physical program above, The strategic plan (Map 11) was suggested

As a result, according to the Diagram 5 and Tables 3 and 4, Diagram 6 was suggested.

##### 5. Overall results of spatial analysis with hierarchical and SWOT

In terms of historical and cultural value, buildings in need of protection (Map 5) were ranked in four major categories: V-1 to V-4. In general, in the process of overlapping layers, it was found that the number of buildings with V-3 values was higher; this layer occupies the central core of the tissue with the most dispersion. They have normal spatial distribution; the spacing of the pieces is relatively similar; and it has the most valuable space.

In terms of construction processes and type of structures: The study area has a very high burnout intensity. According to Map No.6, the new buildings represent significant spatial distribution to the north of the map, and compared to demolished buildings and damaged sites it can be said that the new buildings have a balanced distribution in the area, but compared to other parcels, a significant amount of existing Structure still needs to be rebuilt!

By overlaying layers S\_1 through S\_4, it seems that religious activity is preferable to other social activities in the region. If the layers of S\_2, S\_3 and S\_4 (which are almost biased and functionally similar) are considered as one layer, then the focus of religious activity on historical context becomes more apparent. It is found that most of the religious activity tends to belong to these three groups, especially the S-2 category.

Simply put, buildings with religious activity and similar themes have not moved along with rebuilding or retrofitting processes. In

**Table 2**  
Historical texture problems Comparison of strengths and weaknesses between 2012–2018 years (Authors 2019).

Strength and weak points 2012		Strength and weak points 2018 (according to surveys)	
Strengths points	Weak points	Strengths points	Weak points
Half of the people are satisfied about living in this area	One third of people are not satisfied with living in this area	About half of the people are satisfied about living in this area. Restoration some historical structure in some of the parts	43% of people are not satisfied with living in this area
Highlighting religious centers and people's participation in religious affairs	Less use of cultural and sports centers	Highlighting religious centers and people's participation in religious affairs. Commercial warehouses have increased	The tendency for warehousing has increased. Increase in rental homes. Unofficial user change
A high percentage of people are literate	More than 60% of the education has a under diploma	A high percentage of people are literate. The level of literacy has gone up.	More than 57% of the education has a under diploma
Most people were from Tehran (75%)	Some of these genteel residents are also low in cultural poverty or low income	Most people were from Tehran (67%). Decrease in the percentage of residents form Tehran	Some of these original residents are also poor in terms of culture or low income. Decrease in the percentage of residents from Tehran
Different ethnicities and important role in neighborhood influence and power relations	The existence of different ethnicities, created problems for the coordination	Different ethnicities play important roles in neighborhood influence and power relations	Different ethnicities create problems for coordination. Different ethnicities have different economic potential.
Most households are independent in residential units	There are several households in a residential unit	Most households are independent housing units	Changing some places to heterogeneous functions Increase the number of households in a residential unit
	Increasing stores and workshops and Singles and the gradual exit of old residents	Increasing urban facilities. Increase housing modification. Giving some cultural function to some historical building	Increasing stores and workshops and singles and the gradual withdrawal of older residents - increased activity time. Some parts of these place were destroyed
	The level of living and facilities are low and people are suffering from insecurity, low health and disturbing activities in the neighborhood	Waste mechanization transfer facility and its arrangement. Participating more individuals for protecting historical place.	Reduce residential relaxation parameters. The standard of living and amenities is low and people suffer from insecurity, poor health and disturbing activities in the neighborhood
	Motorcycle traffic is a major of problems	Enforce traffic regulations. Traffic control facilities. Installation of cameras	Motorcycle traffic is the major problem. Increase vehicle traffic. Increase car parks in the passageways

Information section 2012 of this table [33] Information 2018 - Collecting field information. Internship Camp. Shahid Rajaee Teacher Training University, Faculty of Civil Engineering - Department of Surveying and Geographic Information System. November 2018.

terms of functional classification, it is divided into 5 categories with layers 3 and 5 having the highest density. And tend to the outer margins and external communication axes. Other places that are historically unworthy or undervalued are not included in this analysis due to the type of dispersion and specific historical and social linkages. And their positive or negative value was not taken into account in the whole context. (Neither positive nor negative) null were assumed.

In this analysis, considering the spatial location of historical textures, in addition to performing metric methods and geometric computations, it was important to obtain and evaluate people's points of view.

In this regard, the viewpoints of the people regarding the direction and development of historical, cultural, social and other valuable places were taken into consideration. And the analysis found in Tables 1–3 and Map 11 is influenced by people's opinions.

The general idea is that the process will move towards reforming the entire structure of the tissue. Because it's the range that acts as a core and central pole. Due to the importance of texture value in this range, spatial analyzes that can incorporate layers are performed solely on the basis of value, area of neighborhood units, distances, location of units, neighborhood degree, distance ratio and proximity, etc. As follows: First, the texture is evaluated. (Using local people's and experts' opinions) Then, the hierarchical texture grading method was performed. And the strengths and weaknesses of the buildings were identified. At the end of a coherent strategy, a sustainable development strategy was introduced in the center of Tehran.

The Table 5 presents the strategic plan data derived using Diagram 6. Third-generation CPTED has been employed to achieve sustainable security and community in the texture. Given the cur-

rent circumstance of Oudlajan has been proposed. All paths need to be equipped with propitiate light, improve the sewage services and make urban furniture (S-1), (S-10). Restoration and rehabilitation; all the historical and valuable units was another suggest (8/4%) (S-2). The other items that have been proposed in the context: creation 6 parking at the edge of the fabric (S-3), 3 units neighborhood house (S-4), improve or change 236 units (S-5), 4 recreation centers (S-6), 20 units for social and cultural function (S-7) 7 municipal services (S-8), 30 units for mix land in impenetrable spaces, in particular (S-9). Constructing in demolish spaces (S-11), 3 units police stations (S-12), 31 units religious and social activities (S-13).

## 6. Conclusion

CPTED is a methodology employed after the 1960s to prevent crimes. This method, which initiated with physical indices, encompassed social issues to complement designing procedures aiming to increased security. This procedure can serve as a useful approach toward assisting historical textures with security issues.

Historical textures such as Oudlajan which suffer from social and even environmental issues will face a major and irreparable catastrophe with the smallest human (such as a fire) or natural (such as earthquake) disasters, which result in high mortalities among residents and also further texture destruction. This invaluable texture has undergone numerous problems and has been eroded throughout the years as a result of ignorance, which ultimately led to residents' migration out of this historical region and was replaced by individuals with less cultural and social status. Hence, social issues such as felonies, crimes, and misdeeds have arisen. This has led to the texture's insecurity and negligence

**Table 3**  
Problems of the historical context according to the questioner (authors).

Historical context problems concerning the poll	Questions are asked	Reasons
	Need to change Advantages the texture	Due to problems, neglect, and insecurity Presence of religious centers and emamzadeh, historical places, proximity to important arteries, unity of people in carrying out religious ceremonies, The existence of passages with historical names and reminders of the memories, proximity to the subway
	Texture needs	The need for cleaning and garbage collection, the collection of addicts, physical reorganization, coordination between authorities for better tissue management, street care or widening in some points, the need for centers for the participation of young people, children and women.
	Actions were taken in coordination with the authorities	Creating security, highlighting religious buildings, seeing people in planning, creating suitable urban centers for all groups, collecting garbage, building urban infrastructure and tourism, improving management, restoration instead of destroying it in historical texture preventing the loss of memories and memories, Improvement of urban infrastructure, pass easier of the vehicles
	<b>Types of damage</b>	<b>Explanation</b>
	Physical-Space	Inadequate modern practices with new patterns 27% Non-restoring of historical texture 24% Turbulence in urban space (lack of suitable urban facilities, inadequate flooring) 15% Texture destruction in some areas and its abandonment 13% Easier passage of vehicles 8% Lack of tourism infrastructure, 5% Lack of cultural-sports spaces in the texture, 4% Optical confusion available 3% Ignoring architectural patterns in historical design drawings ½% Lack of urban furniture 0.8% The presence of addicts and delinquents in the texture 45% Residents' lack of belonging 25% Social disruption 12% People's lack of confidence in the following entities 10% Cultural poverty 8% Financial problems and poverty 57% The multi-ownership problem in historical texture property, 43% The abandonment of the texture 36% Participation discussion in terms of words 22% The multiplicity of trusted institutions, the abandonment of the texture, 20% The few institutions facilitators, 18% Storing some historical places, 54% Changing the use and exchange to unsafe places 46% Existing waste 52% Sewage 48%
	Social –Cultural	
	Economical	
	Managerial	
	User	
	Environmental	

**Table 4**  
Grading of the damage.

Types of damage	Change in users	Easier passage of vehicles	Ownership problem	Identity Crisis	Lack of spaces	Installation problems	optical pollution	Abandonment and exhaustion	Insecurity and addicts	Waste and Wastewater
Degree of damage	1	2	3	4	5	6	7	8	9	10

**Table 5**  
Assessment Map of 11.

Social stability							
Name	No-unit	Area (M <sup>2</sup> )	Percentage	Name	No-unit	Area (M <sup>2</sup> )	Percentage
S-1	–	22,105 <sup>a</sup>	3.4%	S-8	5	1390	0.1%
S-2	190	53,747	8.34	S-9	10,546	22,105	1/6%
S-3	6	3400	0.5%	S-10	–	22,105	3/4%
S-4	3	780	0.1%	S-11	9	1902	0.3%
S-5	236	82,600	12.6%	S-12	3	520	0.1%
S-6	4	708	0.1%	S-13	31	30,061	4/6%
S-7	20	15,673	2/4%				

<sup>a</sup> Streets and alleys.

leading to its destruction. One was to save this texture is to restore its safety; thus, CPTED can rescue this region of social problems and pressure. First-generation of CPTED which encompassed phys-

ical issues alone was unable to protect and secure the texture; the second generation did not fully conform to the social background of this texture. Although its third generation has been suggested

by Mihinijac et al. [25] third generation crime prevention through environmental design in an article, it does not meet the texture prerequisites. Therefore, the authors of this article proposed an alternative third generation that encompasses social and physical issues of Oudlajan texture to a greater extent. In the meantime, fill out the questionnaire with the help of locals significantly assisted the advancement of the information. The Majority of people mentioned social issues, felonies, and insecurity in the texture. The acquired data was transformed into GIS maps<sup>4</sup>, and the output was analyzed, and ultimately, based on the studies on CPTED theory and Diagram 3 preparation (in accordance to two previous diagrams and social issues promotion) and considering historical texture's status, the strategic plan was developed for Eastern Oudlajan historical texture. This plan's data emphasizes on strong social intervention throughout the texture. Social and cultural places were created almost all over this area some of which are being equipped around the clock. All-access to lighting and furniture is enhanced, and urban facilities and infrastructures and tourism infrastructures are equipped. Traffic regulation leads to higher security and enhancement of physical status results in an increase in the sense of belonging. All of this contributes to social stability and, ultimately, to the preservation of the historical context.

Using of Crime Prevention "Through Environmental Design" (CPTED) focuses on urban design. And it always follows the principles of anti-crime in places. This article examined the first and second generation of CPTED, and developed a third-generation one. Then, tried to look at spatial aspects and factors, show the effects of urban space on the severity of the occurrence and then hide the crime. The results show that, within the historical range of Oudlajan, the high volume of textile problems, and large numbers of crime, are hidden in the backdrop of many historic buildings. This paper has been compiled by descriptive-analytic method and gathered data and questionnaires. Simultaneous study of the first and second generation of CPTED and comparing them with the status of the metropolitan tissue of Tehran (central core) led us to describe the production of the third type.

By combining variants (CPTED) and adaptation of native variant for the central core of Tehran, it is generally thought that the process will move towards reforming the entire structure of the tissue. Based on the localized CPT (type 3), the general view is that the process should move towards modifying the whole tissue structure. Because this range acts as the central core and the pole. The results show that buildings with religious activity and similar themes have not moved along with rebuilding or retrofitting processes. And the weakness of location-based factors has heightened crime rates and increased resident dissatisfaction.

## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.asej.2019.11.003>.

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<sup>4</sup> GIS: we do not use all facilities of GIS, We use just Overlay, <sup>4</sup> GIS of spaces and swot technique.