



# **A Comparative-Historical Study of the Role of the Emergence of Urban Space in the Prevention of Theft Crimes (Case Study: Samen District of Mashhad)**

Hadi Sarvari<sup>1\*</sup>, Seyede Elahe Rezvanian<sup>2</sup>, Farid Bashian<sup>3</sup>

*1. Assistant Professor, Department of Urban Planning, Mashhad Branch, Islamic Azad University, , Mashhad, Iran.*

*2. Master's degree in Urban Design Department of Urban Planning, Mashhad Branch, Islamic Azad University, , Mashhad, Iran.*

*3, PhD Researcher in Urban Planning, Department of Urban Planning, Mashhad Branch, Islamic Azad University, , Mashhad, Iran..*

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## **ABSTRACT**

One of the characteristics of complex systems is their emergence. Samen district, as part of the central area of Mashhad, has been affected by the various urban development plans. The purpose of the current research is to identify the evolution of the effects of the renovation and improvement plans of Samen district, focusing on the role of the emergence of space in the occurrence of theft crimes. In this regard, by using the comparative-historical method, the evolution of the area has been investigated in recent years, and the effect of the layout of the area on committing theft in two time periods before and after the plans has been investigated. Documentary- and library-based studies are considered as the most important data collection tools in the current research. The data of geographic information system was used to measure the emergence of theft, and the data taken from Khorasan Razavi Police Office was used to check the amount of theft. For data analysis, depth map and Arcpro software have been used. The results of the research show an increase in integration in the new area, so that the permeability of the whole district has increased. This increase in integration has caused the distribution of thefts to be extended into neighborhoods, while in the old area, theft crimes mainly occurred in the main streets. Therefore, it can be stated that the changes that have occurred in the area have caused the appearance of "Inviting rather than Uninviting" characteristics.

**Keywords:** *Crime, Space Syntax, Complexity, Integration, Samen District of Mashhad.*

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\*Corresponding author: [sarvari\\_hadi@mshdiau.ac.ir](mailto:sarvari_hadi@mshdiau.ac.ir)



## 1. Introduction

Urban public spaces, as the most important part of cities, are an essential element for social life, which cause movement in urban spaces, exchange of information and awareness, sociability, and also enrichment of the quality of urban environments [1]. If the public space instills a sense of security, in addition to promoting the city, it also increases the level of interactions and social activities of the city's residents and ultimately strengthens the feeling of environmental desirability and satisfaction in the citizens [2]. Since urban spaces are actually the container and platform of social interactions, they should be able to ensure the safety of their residents. Otherwise, people will not be willing to spend their time in such spaces except for cases of necessity and compulsion; this can reduce the dynamism and vitality of the mentioned spaces and eventually turn them into dead spaces without social supervision. On the opposite point, security in the public spaces of a city will follow the vitality and dynamism of the space; its manifestation can be seen in the active presence of people, the creation of a culture of cooperation and interaction, reducing stress and anxiety, the presence of different age and gender groups, and night life [3]. Therefore, urban security is considered as one of the important issues in urban discussions, terminology and organization. In fact, urban security is considered as one of the important and necessary components in urban life, which should provide peace and a sense of safety for citizens in urban spaces [4]. Meanwhile, theft is one of the most common crimes in all societies, especially urban societies. There is no doubt that the occurrence of crime in urban areas has been increasing, and for this reason, the fear and apprehension of people of the society about being a victim of crime have also increased in parallel with it. Accordingly, much attention has been paid to the issue of crime in urban areas by researchers in different parts of the world [5]. The importance and influence of environmental characteristics on the feeling of security or insecurity and fear is so great that nowadays one of the most important approaches to reducing crimes is the situational-spatial approach [6]. One of the most important concepts that can be proposed in connection with this field is the emergence of urban space.

Emergence is known as one of the characteristics of complex systems. A complex

system is a system with multiple interactions between its very different components. Emergence of urban space means that behaviors and communication between space components lead to the formation of a specific state in the system. The behavior that arises and is formed is the way of interactions that take place between the components and it cannot be considered as a result of the movement of a component or element. In this regard, space syntax is the most important theory that expresses the emergence of urban space. Space syntax is a set of methods and theories that study the configuration of a space in an urban scale to understand how the structure of space configuration interacts with social organization and social behaviors [7]. Although the theory of space syntax was presented in Bartlett and by Bill Hillier, its initial roots are based on the studies of such people as Christopher Alexander and then Philip Stedman at the Cambridge University School of Architecture. This theory has come to its present form in about three decades with theoretical expansion, on the one hand and the development of analysis methods and techniques, and the development of hardware and software in the computer world, especially in the early 1980s, on the other hand, and it has brought the space syntax to its current stage [8]. The main idea addressed by this theory is the concept of spatial configuration in which the relationship of each element with other elements of the whole system becomes important [9]. This theory believes that the spatial configuration and the composition of urban spaces are the main factors in the distribution pattern of socio-economic activities such as the distribution pattern of commercial uses, different ethnicities, urban crimes and movement in the city [10], and for analyzing the morphology of a city, the space syntax method provides a range of spatial feature parameters. Samen area of Mashhad City has undergone many changes and developments since the pre-revolution era and many plans and projects have been suggested for it due to the presence of the Holy Shrine of Imam Reza and the presence of pilgrims during the year. Due to the presence of pilgrims and tourists in this area, the issue of security and urban crimes, especially theft, is one of the most important issues that must be addressed, because the presence of tourists and pilgrims requires the security of the environment and its absence will cause many

problems. Therefore, the purpose of the current research is to identify the impact of changes by the renovation and improvement projects of Samen area, focusing on the role of the emergence of space in the occurrence of theft crimes. Therefore, the main question of the research is, "How is the impact of changes made by Samen region's renovation and improvement plans, focusing on the role of the emergence of urban space on the occurrence of theft crimes?" In this regard, the research question will be answered by reviewing the theoretical literature in the field of theft and urban space layout, as well as by examining the historical developments of the area under study related to space syntax and theft crimes in the old and new area.

## 2. Research Background

Ziari et al. (2021) in an article entitled, "Analysis of crime rate of urban spaces based on the theory of spatial arrangement (case study: Pakdasht city)", measured the relationship between security and spatial configuration, indicators of interconnection, connection, selection, control and types of theft crimes. The results of their research show that there is a positive relationship between the occurrence of opportunistic crimes (theft) and the indicators of spatial configuration, so that with the increase in the level of these indicators, the crimes of theft have also increased [11]. Rahimi et al. (2019) in the article, "Explaining the role of space configuration in the perception of environmental security in the historical context of Yazd city", evaluated and explained the effect of the spatial elements of the city on the perception of the environmental security of the residents of the historical fabric of Yazd city by using the theory of space syntax as well as statistical methods, such as weighted geographic regression and multivariate regression. The results of their research show that, based on the theory of space syntax, when the degree of continuity of a street in the entire communication network of the city increases, the psychological security is reported better by the residents of the historical fabric of Yazd city [12]. Jabari et al. (2017) in the article, "Analysis of the spatial structure of theft and drug crime centers in Tehran using the space syntax method with an emphasis on the street", found out that the relationship between the space syntax and the occurrence of crime is extremely complex and subject to different spatial,

economic, social and cultural conditions around it [7]. Coppola and Fasolino (2021) conducted a study, entitled, "A pivotal analysis to define neighborhood crime vulnerability: A methodological proposal", and investigated the accessibility of the urban space and its role in creating security using the theory of space syntax. The results of their research have shown how in a territorial fabric, individual neighborhoods can have different responses to the problem of urban crime due to access conditions [13]. Elgarmadind and Ozer (2018) in the article "The relationship between crime and the street network using the theory of space syntax: A case study of the city of Al-Khams-Libya", investigated the relationship between crime and the network of urban streets using the theory of spatial arrangement. The results of the research show that there is a positive relationship between the space syntax and the crime in the city of Al Khomes [14]. Hiller (2007) in a research entitled, "Theft and robbery crime patterns in the street network of the city of London", showed that in residential areas, less theft and robbery happen in houses that face the street and are located at the corners that can be seen from both sides [15]. Among the differences between the current research and the previous studies, the historical developments of Samen fabric from the perspective of security and complexity might be mentioned. In other words, an attempt has been made to measure the effectiveness of the interventions in the mentioned area in relation to the emergence and security (especially theft crimes).

## 3. Literature Review

### 3.1. Crime and Theft

The occurrence of crime can have unpleasant consequences for people and create a feeling of mistrust, insecurity and vulnerability in people. Of course, the consequences of crime are not limited to the individual level, but they also have negative impacts at the social level. Crime can divide communities and reduce the ability to effectively deal with criminal activities. The spread of fear of crime leads to behaviors that disrupt the entire community [16]. The crime of theft is a phenomenon that disturbs the financial security and life of an individual at the same time; In other words, by committing theft, the thief tries to improve his situation by trespassing on another's property. Creating a sense of financial and life threat in the people of the society while weakening their motivation to try and acquire property and legitimate wealth to a great extent cause an increase in chaos in

social relations, which is followed by the weakening of the foundations of public order and strengthening the social disorganization [17]. Among the different types of theft, we can mention pickpocketing, car theft, home theft, theft from public places and equipment, and extortion. Based on the ideas proposed by the thinkers, in general, it can be stated that there are two main approaches to prevent crime and theft: The first approach is the non-spatial or social approach. The second approach is a local approach that focuses mainly on the opportunity to commit a crime [18]. The spatial factor of the criminal phenomenon, like the time and human factor, can have unique characteristics that make the occurrence of this phenomenon possible, easy or sometimes difficult [19]. Therefore, the characteristics of a place can distinguish it from other places in terms of the occurrence of criminal

phenomena and provide a specific criterion for the implementation of preventive measures [20]. The role and influence of the environment on crime was not given much attention from the beginning. Of course, most of the approaches are deterministic and focus on the influence of the geographic and natural environment on the crime when addressing the issue [21]. One of the features of the spatial approach to urban security is that it emphasizes the role of space configuration on the perception of environmental security and the reduction of urban crime statistics [22]. Among the theories that have a spatial and situational approach to crime are crime pattern theory, broken window theory, defensible space theory, crime prevention through environmental design (CPTED) and space syntax.

**Table1.** Theories related to the spatial approach of committing crime and theft (by authors adapted from [23])

Theories	Theorists	Principles
Crime pattern theory	Patricia and Paul Brantingham(2005)	node, path, edge
Second generation of CPTED	Gregory Seville and Gary Cleveland (1997)	The quality of the physical environment, capacity threshold, social solidarity, communication with outside the neighborhood and collective culture.
Broken window theory	Wilson and George Kling-Brattingham (1982)	Quality of physical environment, natural supervision, social cohesion
Defensible space theory	Oscar Newman (1972)	Territorialism, natural monitoring, space maintenance, juxtaposition of residential facilities and other facilities (mixing of landuse)
Space syntax	Hillier (1970)	Integration, connection, depth, choice
First-generation of CPTED	Tyler and Hall (1960-1980)	Quality of the physical environment, territoriality, natural surveillance, supporting activity, access control (target hardening).

### 3.2. Emergence and Syntax of the Urban Space

Complex systems are systems the whole of which is greater than the sum of their parts. The characteristics of complex systems include emergence, self-organization and non-linear adaptive communication, as well as long-term dependence, history and transformation, irreversibility, lack of determinism and layeredness. As mentioned, one of the characteristics of complex systems is appearance and emergence. Emergence means the formation of new and coherent structures, patterns, and features in a complex system in the process of self-organization [24] and the characteristics that show it is impossible to reduce the overall scheme of the system's evolution to a set of behaviors of individual agents [25]. The whole is greater than the sum of its parts [26]. Emergence is the process by which smaller entities, components and patterns in a system interact with each other, resulting in (usually) larger entities or behaviors that are not visible at the initial scale [27]. One of the theories that analyzes the emergence of urban space is the theory of space syntax. In the space syntax, the

pattern of the combination of spaces and the way of communication between them are examined and the characteristics deriving from the result of each space are identified. The most important characteristic that can be identified in this theory is the degree of interconnectedness and separation of the tissue, which can be used in understanding the spatial and social structures [10]. The theory of space syntax is a theory that is presented in opposition to the theory of defensible spaces and based on Jacobs' theory of open eyes. This theory and method has been introduced to describe and quantify the spatial syntax of enclosed spaces within buildings and the space syntax of streets within the city using the topological approach [28]. Contrary to the theory of defensible space, instead of removing strangers from urban spaces, Hillier tries to provide security by their presence in public spaces and two-way relations between residents of the neighborhood and the strangers. In the theory of space syntax, strangers are not removed but controlled. The space is also secured by the controlled presence of strangers, and the security of these people is ensured through direct

contact with the residents of the neighborhood [29]. Space syntax is the use of the variables obtained from the analysis of space configuration in recognizing the patterns of different geometric elements that have been created by buildings and cities [30]. The application of the space syntax method is basically to evaluate the capability of the proposed plans in meeting the requirements of the plan, such as creating, directing and predicting movement in the city. Thus, by using this method, it is possible to identify the pattern of movement or distribution of uses in the current state of the city, based on which, the desired patterns can be predicted in the proposed plans, so as to ensure the effectiveness of the proposed plans [31]. In order to predict the movement of pedestrians, the space layout method can be used to identify the most accessible and isolated routes in order to guide and manage the movement of pedestrians optimally [32], [33]. An axial map is an image of the spatial arrangement of a city, and this image can be measured by the index of "Integration". Integration is the main concept of space composition, which is developed based on the method of space syntax [34]. The concept of Integration can be defined as follows: the value of the integration rate of each line (space) is the average number of intermediate lines (spaces) from which it is possible to reach all the spaces of the city; in other words, it is the average number of changes of directions that can be reached from that space to all the spaces of the city;

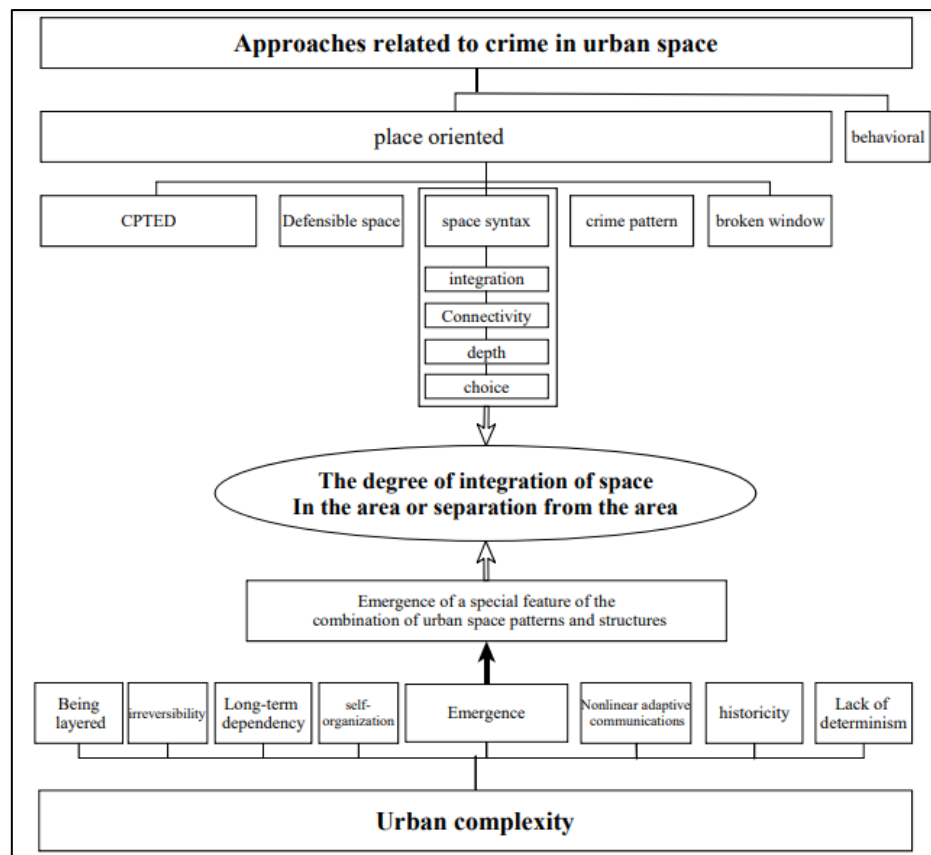
therefore, integration in the method of space syntax has a relational concept and not a distance and metric concept [30]. Another component of space syntax is connectivity. The objective concept of connectivity means spatial connectivity. It means that the greater the connectivity value, the greater the number of connections between the desired space and other spaces. Its practical concept can be expressed as the access to the desired numerical value [35]. In other words, connectivity is defined as the number of nodes that are directly connected to each individual node in the connectivity graph. Another component of space syntax is selection. Spatial choice means the probability of space to reach a high integration. This value is high for a node when the shortest paths between both nodes in the system pass through the desired node; in other words, if the probability of using a space in traveling the shortest routes between any two possible spaces in the entire urban system is high, then the value of choosing this space is higher. The spaces in which the amount of choice is high are usually the spaces that are likely to be used more to reach the most integrated spaces. Various studies report the existence of a correlation between the amount of choice and the movement of pedestrians or the localization of commercial applications [36]. Based on the theoretical literature review, the variables, criteria and sub-criteria of the research are presented in Table 2.

**Table 2.** Criteria and sub-criteria of the research(source: authors, 2023)

Variables	Criteria	Sub-criteria
Independent variables	Emergence	Integration
		Connection
		Depth
		Choice
dependent variable	Theft	bag-snatcher
		Theft from car
		Theft from home
		Theft from public places and equipment
		mugging

In general, in relation to the theoretical framework of the research, the approaches related to crime in the urban space can be divided into two types: behavioral and spatial. Among the spatial theories of crime are: broken window, crime pattern, defensible space, crime prevention through environmental design and space syntax. In the theory of space syntax, the degree of integration of the urban space in the area or its isolation is examined. Based on the

theory of complexity, the city as a complex system has characteristics such as emergence. The characteristic of emergence refers to the emergence of a special characteristic of the combination of patterns and structures of the urban space. The identification of the mentioned features can lead to the explanation of the reasons for the integration or isolation of the urban space in the area, which is in other words, the space syntax.

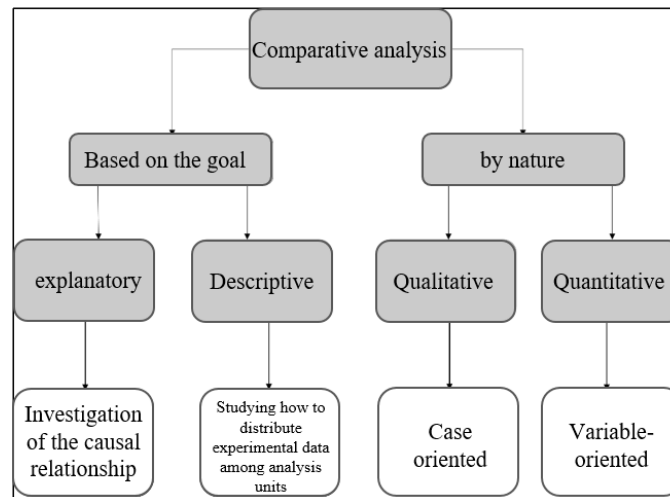


**Figure1.** The theoretical framework of the research (by authors adapted from [23] and [16],[17],[18],[30],[31],[32],[33])

#### 4. Methodology

The present research is a comparative-historical study which is quantitative and variable-oriented in nature and based on the explanatory purpose. The comparative-historical method is the best way to "know" changes in phenomena and to conduct a systematic study of macro structures and long-term processes [37], which not only provides the possibility of identifying the existing structures in the "present" time, but also helps to explain the causes and consequences of these structures [38]. This method is a macro configuration view [39], the main concern of which is emphasizing the processes over time and the use of systematic comparisons [40]. In this research, with an interim survey of Samen area of Mashhad city, the relationship between the variables of emergence and theft crimes is investigated in two time periods before and after

the implementation of renovation and improvement plans. Documentary- and library-based studies are considered as the most important data collection tools in this research. The data of "geographic information system" was used to measure the emergence of theft (in 1996 and 2023), and the data taken from Khorasan Razavi Police Office (in 1996 and 2023) was used to check the amount of theft. Depth map software has been used to analyze the data related to emergence. In order to do this, first, an axial map is prepared in the software, and then the outputs related to the space syntax variables are prepared. Arcgis pro software is also used to analyze the distribution of theft crimes. For this purpose, by inserting the theft data, a thermal map of theft distribution has been obtained.

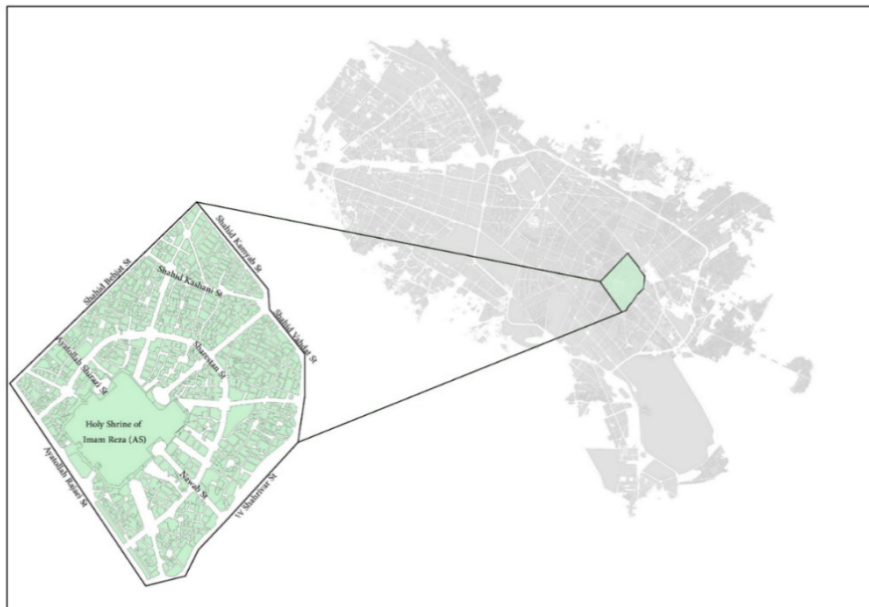


**Figure2.** Types of comparative studies [41]

### 5. Case Study

Samen area of Mashhad is one of the 17 districts of Mashhad municipality, and it is also one of the historical areas of the city center, which is located at the heart of Mashhad city, and the holy shrine of Imam Reza is the gem of this area. Samen area is separated from other areas from the south by Reza Bazaar and Shahid Andarzgo Street, from the east by Vahdat Boulevard and Hefdeh Shahrivar Boulevard, from the west by Azadi Street and

Shahid Rajae Street, and from the north by Shahid Kaveh Boulevard and Vahdat Boulevard. The process of changes in the space and activities in the city of Mashhad, due to the presence of the shrine of Imam Reza and the unique location of the surrounding area of the Holy Shrine, which welcomes millions of pilgrims and travelers every year, has led to the preparation of several plans during different years, the most recent of which is "Hareem Razavi's Plan".




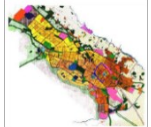






**Picture1.** Location of the study area in Mashhad city (source: authors, 2023)

The importance of Samen area of Mashhad and the presence of pilgrims in this area have caused the construction of hotels, settlements and commercial complexes to expand significantly in this area, and over time, the historical and old area of this area has been replaced by high-rise and modern buildings. Therefore, today we are faced with a disjointed area that does not have any integration between its elements. One of the consequences of the above-

mentioned interventions, based on the statistics of the police force and experts, has been an increase in the amount of pickpocketing and theft from vehicles, as well as a noticeable change in its distribution in the investigated context. Therefore, investigating and explaining its reasons is essential for the pathology of interventions in such a pilgrimage and religious area.

**Table3.** The background of the central fabric plans of Mashhad city (source: authors.2023)

	Project Title	Year	Actions	Map
Before revolution period	The construction of main square during the first Pahlavi era	1930-1933	- dapting the historical city to the needs of today's modern city - Connection of riders up and down the street	
	The plan proposed by Borbur consultant	1973	- Organizing and renovating the immediate area around the shrine complex -Cleansing the tissue surrounding the holy shrine of Razavi and creating a green space in its place, as well as establishing public, commercial and residential buildings that are stair-stepped.	
After revolution period	The design of the Iranian house building company	1988	-renovation of the immediate area around the Holy Shrine complex. -Construction of buildings and facilities in order to meet the service and welfare needs of pilgrims. -Construction of an underpass and three roundabouts at the end of the main streets leading to the shrine.	
	The second master plan of Mashhad	1993	Maintaining and revitalizing the existing values and providing suitable conditions for the proper functioning of the city center	
	Renovation and reconstruction plan around the Holy Shrine	1995	Twelve streets with the aim of visual continuity radially towards the Holy Shrine with the assumption of an empty and uninhabited context	
	The project of renovation and improvement of the area around the holy shrine of Hazrat Reza	2008	- Increasing the share of commercial-residential use and building densities, modifying the route of the converter ring, increasing the share of the road network, reducing the share of residential use and increasing the limit of aggregation of parts. - According to the blocks of the existing situation, but the structure of the original design such as radials, converter ring, leveling of the spaces of passages and gardens	
	A strategic plan for improving and guiding the development in the area around holy Shrine	2015	Following implementation delays and non-fulfillment of the plan, as well as criticisms from various institutions	
	Hareem Razavi plan (detailed special paln of the area around the holy shrine of Imam Reza)	2019	Creating a integration between the shrine, the city, pilgrimage and residence, revitalizing the fabric around the shrine, facilitating residence for the neighbors and ease of pilgrimage for pilgrims.	



## 5. Discussion

### 5.1. Examining the Variables of Space Syntax

In order to examine the structure of the space syntax, first the map of the old and new texture of the area was drawn based on the axial lines, and then the four key factors of connectivity, depth, choice and integration were calculated in the Depth Map software. The description of each of the mentioned factors in two time periods is shown in Table 4.

- **Connectivity**

It is clear from the old connectivity map of the area that the network of internal passages in Tabarsi street has the most connections (red color) and the more internal the passages, the more distant they are from the surrounding streets, and the less the connections they have. This is in complete agreement with the low permeability of the network of organic passages. But in the new plan of this area, Tabarsi Street has the least connectivity (blue color) and the connections in other axes and inner axes have increased (red color). It is clear from the comparison of the connectivity parameter values of the central area of Mashhad in two time periods that the amount of connectivity in the new area is higher than the old area in all levels, which shows the increase in accessibility and ease of access to the Holy Shrine (first row of Table 4).

- **Depth**

From the depth map of the old area, it is clear that the network of passages inside the area was deeper (red color) than the new area. Due to the organic network of passages that have a hierarchical

### 5.2. Examining the Theft Variable

Based on the information obtained from Mashhad Police Force, the distribution of theft crimes in Samen area has been simulated using "Arcgis pro" software in the form of a heat map. According to the obtained map, the distribution of theft crimes in the old area of Samen was mainly along the main streets including Tabarsi, Shirazi, Nawab and Imam Reza. The combination of the spatial patterns of the old area has led to the emergence of the "uninviting" feature in the inner area of the neighborhoods, while in the new area, theft crimes have been extended into

structure, direct access to the main space is not possible, and therefore, to reach it, one must pass through many intermediate spaces, which is seen in many historical area of the country. In this way, this characteristic occurs in historical and old spaces, where by reducing the permeability (both access and visual) a living space is created away from the strangers and with spatial privacy and a sense of security for the residents is established, a feature that has been called the uninviting feature of old neighborhoods. The depth of the passages in the old area of the target area has been greater, and the new plan has increased the presence of strangers in the old area and reduced security (second row of Table 4).

- **Choice**

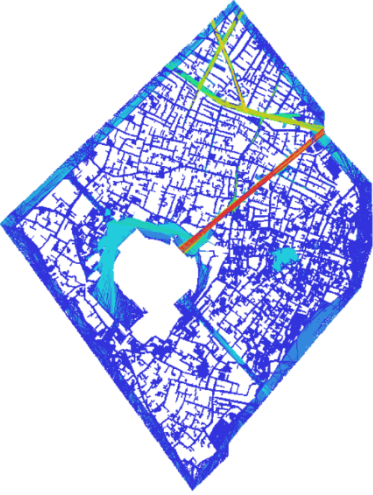

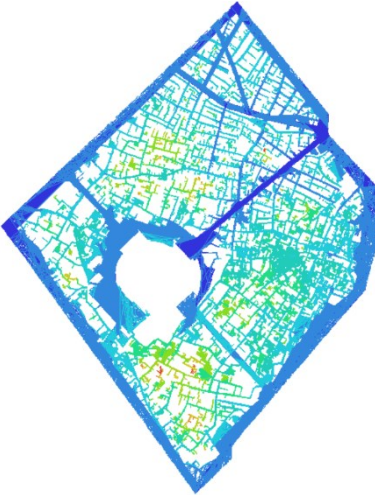

According to the area choice map, in addition to Tabarsi axis, which was the most important access street to Imam Reza's shrine, in the new plan, the Sharestan road is also an option for ease of access. The choice of passages for access and traffic has been more in the old area (third row of Table 4).





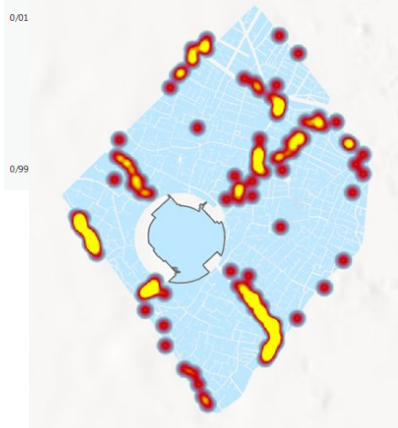
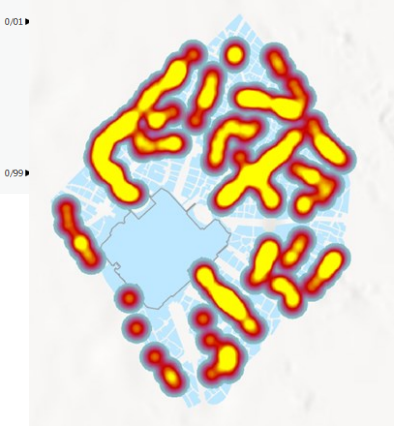
- **Integration**

In general, the degree of conjugation in the old tissue is lower than the degree of conjugation in the new tissue. The construction of new roads and the improvement of tissue permeability have increased the connectivity in the entire range (fourth row of Table 4).

the neighborhoods and the reason for this is the increase in permeability through the extensive destruction of the residential area and the construction of new streets. In other words, it can be stated that we are witnessing the emergence of the "inviting" feature in the new area. Also, the statistics show that most of the robberies in the old context were of the pickpocket type, but in the new context, in addition to the pickpocket, crimes such as car theft are also observed.

**Table4.** Comparative comparison of space syntax variables and theft crimes in Samen area (source: authors.2023)

Variables	Old Map			New Map		
1.Connectivity						
	Minnum	Average	Maximum	Minnum	Average	Maximum
	2	409.3	5789	2	374.36	2354
2.depth						
	Minnum	Average	Maximum	Minnum	Average	Maximum
	4.1	6.8	14.2	3.35	5	8.7

Variables	Old Map			New Map		
3.choice						
	Minnum 0	Average 600925	Maximum 5.44	Minnum 0	Average 99363.3	Maximum 1.98
4.integration						
	Minnum 1.06	Average 2.5	Maximum 4.5	Minnum 1.55	Average 3.1	Maximum 5
5.Theft	 <p data-bbox="422 1877 885 1930">Heat map of the distribution of theft crimes in the old map</p>			 <p data-bbox="933 1877 1396 1930">Heat map of the distribution of theft crimes in new map</p>		

Based on the information obtained, the amount of bag-snatcher crimes has grown significantly and the crimes of car theft and mugging have also increased, but the crimes of theft from homes and public places

have decreased. The main reason is the change of residential context to commercial-residential context.

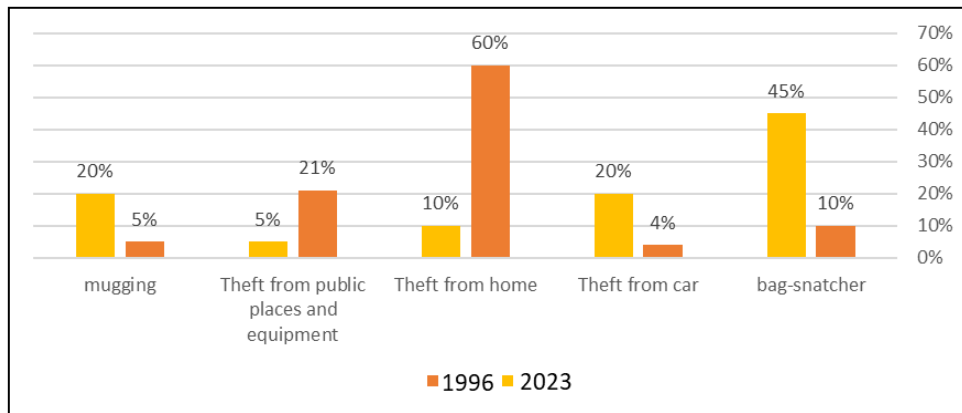


Figure3. The amount of theft in 1996 and 2023

6. Findings and Conclusion

The purpose of the current research is to identify the impact of changes in the modernization and improvement projects of Samen area, focusing on the role of the emergence of space in the occurrence of theft crime. Therefore, the main question of the research is “How is the impact of changes made by Samen region's renovation and improvement plans, focusing on the role of the emergence of urban space on the occurrence of theft crimes?” Among the differences between the present research and the previous studies, the investigation of the historical developments of Samen area from the perspective of security and complexity could be mentioned. In other words, an attempt has been made to measure the effectiveness of the interventions in the mentioned area in relation to the emergence and security (especially theft crimes). The feature of "emergence" as one of the principles of complex systems plays an important role in the occurrence of theft crimes in the urban space. The characteristic of

emergence refers to the emergence of a special feature of the combination of patterns and structures of urban space. The comparison between the space arrangement variables in two time periods of in Samen area of Mashhad city has shown that, on average, in the old area, there were fewer connections, more depth, more choice and less integration. The distribution of robbery crimes in the old context shows that most of the robberies happened in the main streets and the inner context of the neighborhoods was a safe space, while in the new area, theft also occurs in the inner context of the neighborhoods. This was due to extensive interventions and extensive destruction of the area, as well as the construction of new streets. In other words, the combination of the patterns of the old texture space has caused the appearance of "uninviting" features, and the new area patterns have created "inviting" characteristics. Therefore, due to this change, today much insecurity in the space in most of the area is observed.

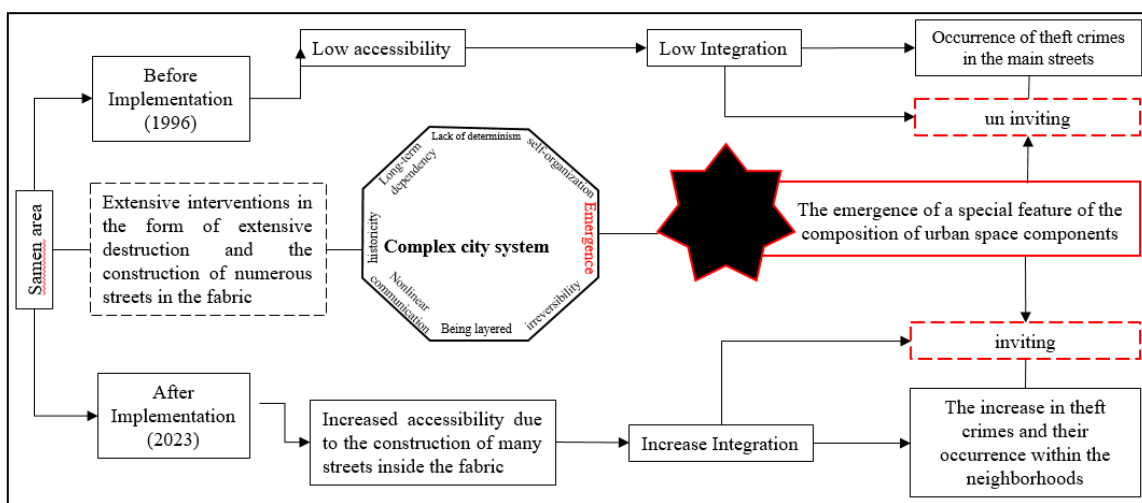


Figure4. The emergence of theft crimes in the old and new map of Samen district (source: authors.2023)

## Reference

- Madanipour, A. (2012). Challenges in the Co-production of Urban Spaces in National and International Context, Planning Theory and Urban Development, Faculty of Architecture, RWTH Aachen University.
- Muayidi, Mohammad; Alinjad, Manouchehr and Navaei, Hossein (2013) "Investigation of the role of urban landscape components in improving the level of feeling of security in urban public spaces (case study, Evin neighborhood of Tehran)", Social Security Studies, No. 35, pp. 159-191.
- Izadi, M. S., & Haghi, M. R. (2015). Improvement of Sense of Security in Public Spaces Through Urban Design, Case Study: Imam Square in Hamadan. *Honar-Ha-Ye-Ziba: Memory Va ShahrSazi*, 20(2), 5-12.
- Soltani, Leila; Beyk, Mohammadi, Hassan and Heydari, Samia (2015) "Spatial analysis of the feeling of security in different urban areas (case study: Quds city)", Strategic Researches of Security and Social Order, No. 3, pp. 104-78.
- Shafer, C. S., Lee, B. K., & Turner, S. (2006). "A tale of three greenway trails: User perceptions related to quality of life", Landscape and Urban Planning, 49, 163-178.
- Quicka, M., Li, G., Smith, I.B. 2018, Crime-general and crime-specific spatial patterns: A multivariate spatial analysis of four crime types at the small-area scale, Journal of Criminal Justice 58, pp. 22-32.
- Jabari, Mohammad Kazem, Nasteri, Mohin, Mohammadi, Mahmoud, Kalantari, Mohsen (2017) "Geographical analysis of spatial layout factors and its relationship with urban crime scenes (case study: robbery and drug crimes in Tehran)". Scientific Quarterly, Approach to Crime, 1(2), 13-40.
- Mokhtarzadeh, Safora (2017) "Investigation of the effect of modifying the spatial structure of the historical context of cities on the development of these contexts by using the method of spatial arrangement, a case study: the historical context of Mashhad". Master's thesis. Isfahan: University of Arts.
- Hillier, B, A Penn, J Hanson, T Grajewski, and J Xu (1993): Natural movement: or, configuration and attraction in urban pedestrian movement. Environment and Planning B: Planning and Design, 20 29-66.
- Hillier, B, and L Vaughan (2007): The city as one thing. Progress in Planning, Vol 67, Issue. 3 205-230.
- Ziyari, Karamat Elah, Abbasi Fallah, Vahid, Khodabandeh Lo, Hassan, Ehsasi Khah, Mehdi (1400) "Analysis of crime in urban spaces based on the theory of space arrangement (case study: Pakdasht city)". Human settlement planning studies. 16(1), 81-94.
- Rahimi, Hojat Elah, Karimkhani, Akram, Hatami, Aniseh (2019) "Explaining the role of space configuration on the perception of environmental security in the historical context of Yazd city". Urban Planning Geography Research, 8(3), 631-650.
- Coppola, F., Fasolino, I. (2021). The Axial Analysis for Defining Neighborhoods' Crime Vulnerability. A Methodological Proposal. In: , et al. Computational Science and Its Applications – ICCSA 2021. ICCSA 2021. Lecture Notes in Computer Science, vol 12958. Springer, Cham.
- Elgarmadiand ,A. S., & Özer, Özlem(2018).The relationship of crime to the street network using the space syntax theory, Case study Al-khums City-Libya. International Journal of Latest Research in Humanities and Social Science (IJLRHSS) Volume 01 - Issue 07 .PP. 21-27.
- Hillier, B. (2007). Space is the machine, A configurational theory of architecture Space Syntax.
- Hale, C. (1996). "Fear of crime : a review of the literature", International Review of Victimology, Vol., 4, pp. 79-150
- Moghimi Mehdi (2016) "Investigating the effect of quality of life on the crime of theft". Jurisprudential views; 22 (79 and 80): 149-170.
- Salimi, Farzaneh, Ghaemi, Laleh, Adeli, Najmeh, Iqbal Moghadam, Roya (2015) "Measuring the success rate of the Akhund neighborhood center project in Qazvin city in improving the security.
- Hataminejad, Hossein, Mansouri, Babar, Fahli, Mohammad (2012) "Explaining the role of urban spaces in preventing crime and creating security". Geographical Information Scientific-Research Quarterly (87), 68-76.22.
- Varvai, Akbar and Hatemzadeh, Jamshid (2014) "Crime prevention through architecture and urban planning (case study: main streets of District 4 of Kermanshah Municipality)". Social Order Quarterly, 7(2).
- Cozens, P., D. Hiller, G., Prescott, (2005), "Crime and the Design Residential Property- Exploring the Theoretical Background"; journal of Property Management, vol.19, Issue, PP. 136-164.
- Shariati, A., & Guerette, R. T. (2017). Situational Crime Prevention. Preventing Crime and Violence, 261-268.
- Abdullahzadeh Fard, Alireza, Khosravi, Roja (2016) "The role of reducing crime opportunities in improving the security of urban neighborhoods using a spatial approach (case study: Saadi and Koushak Maidan neighborhoods, Shiraz city)". Regional Planning Scientific Quarterly, 7(28), 191-200.
- Goldstein, Jeffrey. 1999. "Emergence as a construct: History and issues." Emergence 1 (1):49-72.
- Bertuglia, C. S. and F. Vaio (2005), Nonlinearity, Chaos and Complexity: The Dynamics of Natural and Social Systems, Oxford: University Press.

26. Abel, D. L. (2009), "The Capabilities of Chaos and Complexity", *International Journal of Molecular Sciences*, vol. 10, no.1.
27. Sengupta, Ulysses. (2017). *Complexity Theory: The Urban is a Complex Adaptive System*.
28. Koohsari, M. J., Oka, K., Owen, N., & Sugiyama, T. (2019). Natural Movement: A Space Syntax Theory Linking Urban form and Function with Walking for Transport. *Health & Place*, 58, 102072.
29. Hillier, B., & Hanson, J. (1989). *The Social Logic of Space*. Cambridge University Press.
30. Abbas Zadegan, Mustafa (2008) "Method of arranging space in the urban design process". *Quarterly Journal of Urban Management*, No. 9, 75-64.
31. Peponis, J. Bafina, S. & Shpuza, E. (2004), *Space syntax. Implications*, 4(12), 25/3/2009.
32. Abubakar, I. & Aina, Y.A. (2006). *GIS and Space Syntax: An analysis of accessibility to urban green areas in doha district of Dammam metropolitan area, Saudi arabia*, Paper presented at the Conference *Proceeding Map Middle East 2006*.
33. Jiang, B. Claramunt, C. Batty, M. (1999). Geometric accessibility and geographic information: Extending desktop GIS to Space Syntax. *Computers, Environment and Urban Systems*, 23, PP161-171.
34. Abbas Zadegan, Mostafa, Safura Mokhtarzadeh and Rasul Bidram (2012) "Analysis of the relationship between spatial structure and the development of urban areas by the method of spatial layout (case study: Mashhad city)". *Urban and regional studies and researches*, 4th year, 4th issue. 43-62.
35. Mousavi, Mahnaz, and Hanieh Zargar Daghigh (2009) "Analysis of the spatial structure of Tabriz city in the area of Baru using Space Syntax technique". *Abadi Quarterly*, No. 67, 72-77.
36. Lam, K. S (2008): *An introduction of space synta*. Retrieved 02/16.
37. Shojaei, Nima (2022) "Introduction to the comparative-historical analysis method in connection with the issue of democracy in Iran". *Iranian Journal of Sociology*, 22(3), 27-50.
38. Tilly, Charles (1984), *Big Structures, Large Processes and Huge Comparisons*, New York: Russell Sage Foundation.
39. Mahoney, James and Thelen, Kathleen (ed.) (2015), *Advances in Comparative Historical Analysis*, Cambridge: Cambridge University Press.
40. Mahoney, James and Rueschemeyer, Dietrich (2003), *Comparative Historical Analysis in the Social Sciences*, New York: Cambridge University Press.
41. Sa'i, Ali (2014) *Comparative research method: with quantitative, historical and fuzzy analysis approach*, Eshar Aghah, segunda Edition.