



## Evaluating of Urban Space Vitality: The Role of Safety, Security, and Urban Planning in the Religion Center of Kufa City, Iraq

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### ABSTRACT

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Urban vitality, a critical concept that differentiates thriving cities from others, is a characteristic that infuses life into a city and stimulates its activity. This study in their objectives examines the underlying factors contributing to the vitality of urban spaces, with a specific emphasis on safety and security. A methodology that depends on the identification of a framework of five key elements - density, accessibility, social interaction, surveillance, and activities - is put forward as vital to urban vitality. The presence of these elements is postulated to be contingent on the provision of safety and security in urban environments, and their influence is believed to extend to the duration and nature of human engagement with these spaces. The open space of the religious center in Kufa City, Iraq provides the contextual setting for this investigation. These factors were measured by utilizing the Geographic Information System (GIS) data, supplemented with field surveys and observation, to measure indicators of the aforementioned elements within the study area. Additionally, statistical methods are employed to quantify some of these indicators. The findings suggest a satisfactory level of vitality within the study area, as the majority of the proposed indicators are met. This is largely attributed to the presence of safety and security measures. However, the study also identifies areas for improvement, particularly in the regulation of land use and the management of vehicle speed on roads leading to the open space.

## 1. INTRODUCTION

Public and open spaces have long captivated the attention of urban designers, planners, and sociologists, the origins of which can be traced back to the Greek agoras and Roman forums. However, in the modern era, urban spaces have suffered significant degradation due to planning approaches that prioritize automobiles over eco-friendly mobility options. The resulting wide streets designed for high-speed traffic and passing cars pose a multitude of threats, including increased emissions, environmental pollution, and heightened risk of accidents, alongside the adverse effects of noise and high temperatures [1].

Research into the social environment reveals a strong correlation between urban vitality and the emotional state of inhabitants. The quality of urban design elements and the diversity of activities within urban spaces can stimulate or enhance this vitality, leading to a more efficient utilization of these spaces for social and recreational activities. While these assessments have traditionally relied on surveys and researcher self-evaluation, the advent of modern technologies, such as sensors and aerial imagery, has facilitated the creation of expansive databases. These databases enable a comprehensive insight into the factors influencing urban vitality, which encompass space morphology, community activities, urban events, and other factors [2].

The concept of vitality is a crucial consideration in urban planning and design due to its alignment with sustainability goals. It takes into account the needs and considerations of people and promotes their health, comfort, and security [3]. This is often achieved through promoting pedestrian-friendly activities such as walking and cycling, thereby enhancing overall city life. Vitality is further linked to the reconfiguration and allocation of urban spaces in a way that fosters diverse human activities, restores streets for multiple uses, and provides private leisure and relaxation spaces [4]. It also involves the creation of safe and accessible spaces, equipped with all necessary amenities, that cater to all segments of society [5].

Safety and security are closely intertwined with urban vitality and are subject to various criteria. These include cultural awareness of observers and their sense of spatial belonging, alongside recreational, social, and cultural aspects. Efficacious security performance depends largely on protection from traffic, crime, and violence, as well as the mitigation of unpleasant emotional experiences [6].

Alrobaee et al. [7] advanced the discourse on urban safety, positing that a blend of uses, the provision of services, and safe housing, alongside enforced surveillance of open spaces and the restriction of unfamiliar entrants, can amplify the chances of crime reduction. This strategy, they argue, can augment urban vitality and sustainability. The authors further postulate

that the promotion of social cohesion and the initiation of activities that ensure constant spatial movement can render urban spaces more effective and safer than those with minimal activity due to prolonged periods of inhabitant absence.

In a similar vein, Li et al. [8] investigated the interface between urban vitality and the built environment, endeavoring to discern the impacts of environmental factors on urban vitality patterns. Their study, which incorporated six dimensions of built environmental factors (neighborhood attributes, urban form and function, landscape, location, and street configuration) into a quantitative regression model, unveiled a predominantly positive correlation between urban vitality and factors such as population density, community age, open space, pavement ratio, street lights, shopping and leisure density, integration, and proximity to transport. Conversely, an inverse relationship was found between urban vitality and road density, proximity to parks, and green spaces [8].

Echoing this sentiment, Guo et al. [9] underscored the significance of social values in bolstering the vitality of urban spaces, while illuminating the basic structure of urban path vitality. Their findings suggest that urban spaces with key elements of safety and security induce longer dwell times, rendering these spaces more attractive and thus drawing more people into a continuous cycle of social relations within the urban space. This, in turn, enhances the vitality of the urban space.

Nia [10], in a more nuanced investigation, hypothesized a pivotal role for aesthetics in urban design in the vitality of urban space. Nia's study suggests that the integration of complexity theory with five main dimensions proposed for vitality (social, economic, environmental, cultural, and ecological), when compared with Maslow's hierarchy of needs, can culminate in more vibrant environments. The study further establishes a close relationship between the effectiveness of aesthetics in urban design and the vital activities that support these activities in crafting urban spaces.

The exploration of human comfort and psychological welfare within the public sphere has been advanced by Rathod and Wagner [11], who posit that these elements contribute significantly to a safe and engaging environment that promotes pedestrian activity and usage of public spaces. The impact of public spaces on the satisfactory stimulation of human sensory systems was examined, with human sensory experience being employed as an analytical tool to assess the conditions of public urban spaces and consequently inform suitable design decisions.

Similarly, Xia et al. [12] delved into the relationship between the density of urban uses and their vitality, with a particular focus on street length and topology. Their research measured daytime and nighttime vitality quantitatively, through the density of restaurant visitors and nocturnal lighting. Employing a local index of spatial association, it was found that areas with a high density of activities tended to be more vibrant and conducive to economic and social activities. The study further underscored the necessity of a comprehensive understanding of the city, integrated into urban planning practices, despite notable discrepancies in some spaces due to suboptimal utilization. Additionally, the research highlighted contrasts in vitality between daytime and nighttime, between old and newly developed traditional areas, and the degree of diversity and density in land use.

A review of recent studies reveals that urban vitality has been addressed from diverse perspectives - societal, built environment, urban form, and human psychological comfort

and well-being. However, most of the previous literature did not address the role of security and safety elements, which will be addressed in this paper, and their role in enhancing the urban vitality of spaces in religious city centers. Because this topic is of great importance, this paper will seek to explore the nexus between safety and security with urban vitality, through the potential of safety and security to enhance the vitality of urban space. Consequently, the study poses the question: What are the factors and indicators of safety and security, or what are the physical characteristics that safety and security impart to urban environments that could amplify the vitality of urban space?

Assuming that safety and security indicators are primary catalysts of vitality, it can be postulated that an urban space cannot be vibrant and bustling with user activity unless it encompasses safety and security attributes within its environment. The significance of the research lies in pinpointing the safety and security factors that, in turn, influence and augment the vitality of urban space. Such organization could contribute positively to the emergence of urban activities and uses, while also improving the attributes of urban space.

The geographical information systems environment and statistical methods will be used to measure the indicators of the elements extracted from the theoretical framework, which will be applied to a selected space in the urban center of the city of Kufa to produce the most important results that show the level of vitality of the urban space in the city.

## **2. SECURITY AND SAFETY FACTORS AFFECTING THE VITALITY OF URBAN SPACE**

Safety and security are achieved when residents exist and move within a specific urban space. Proximity and short distances are basic incentives for the presence of the population and their movement to places and spaces that are attractive, and include a group of different functions, activities, and uses. The presence of the population within these areas provides more eyes to surveillance the space and impose control over it by following all the events that take place within these spaces [13]. This may be an important reason for the decrease in the rates of physical violence and psychological pressure to which the users of the spaces are exposed because these spaces allow their users to practice the events and activities that they need without any threats or fear. The socially and urban cohesive places provide an environment characterized by comfort, tranquility, and psychological stability [14]. Therefore, in this part of the research, the focus will be on the factors and indicators that are related to safety and security, through which the vitality of urban space can be enhanced.

### **2.1 Density**

Density expresses the number of people within a unit area. The presence of people is closely related to the availability of the factor of safety and security within the spaces, as the number of users increases with the increase in the rate of safety and security in the spaces. This is reflected in the density of users visiting the space, whether the destination of the trip is entertainment or spiritual and psychological purposes [15, 16]. This factor can be divided into two main indicators:

- (1) Space user density index: It represents the number of

users within a given urban area, and it is a measure of environments that encourage walking and access to different destinations. These densities guarantee and stimulate the emergence of many uses and activities within the urban space [17, 18]. The urban space density index is one of the most reliable measures to measure the vitality of space. As high-density environments are vital environments that stimulate the movement of pedestrians and activate the vitality of space. It can be calculated by the following equation [19]:

$$UDI_i = (U_{srs_i} / A_i) / \max(U_{srs_i} / A_i), 0 \leq UDI_i \leq 1 \quad (1)$$

where,

$U_{srs_i}$  is the total number of users of urban space  $i$ .

$A_i$  is the area of urban space  $i$ .

It can be measured by calculating the number of users within the urban space divided by the area of space, then dividing this extracted value by the user density of the highest-used space in the city. The output value should range from (0-1), and the closer the output value is to (1), the higher and more effective the usage intensity.

(2) Commercial activity intensity index: It refers to the area allocated for uses that are characterized by commercial activity and functions divided by the total area of the space [20-22]. These activities usually surround urban spaces. This indicator is one of the important indicators that express the vitality of the spaces, as the attractive activities increase the possibility of users moving to the space. This indicator can be measured by the following equation [19]:

$$CDI_i = (GFA_i / A_i) / \max(GFA_i / A_i), 0 \leq CDI_i \leq 1 \quad (2)$$

where,

(i) is the intended urban space,  $GFA_i$  is the total floor area of commercial activity in urban space  $i$ .  $A_i$  is the area of urban space  $i$ .

The same interpretation is adopted for the previous equation, but here the dependence is on the area allocated for uses with commercial and functional activity divided by the total area, then the extracted value is divided by the intensity of activities for the highest use value in the city. The output value should range from (0-1), and the closer the output value is to (1), the higher and more effective the usage intensity.

## 2.2 Accessibility

This factor includes several indicators through which the vitality of places can be achieved. Permeability and number of connections play an important role in generating and increasing pedestrian traffic for safe urban spaces. The greater the number of these links, the greater the permeability. This permeability will lead to a greater density of pedestrians and more people flocking to public squares, and places where activities are located [23-25]. It should be noted here that the presence of people within the spaces needs to provide the support structure represented by resting places, seating terraces, water fountains, shading, and landscaping, as well as determining the speed rate of the streets leading to the spaces. This factor can be measured by the following indicators:

(1) Distance of access to services and other land uses: The distance of access from space to other uses that include services shall be determined at a distance not exceeding half a mile. This distance is suitable and comfortable to access services [26, 27].

(2) Supporting structure: This indicator is represented by

providing places for sitting and resting, fountains, and floors suitable for the movement of strollers. These requirements increase the vitality of resting places and motivate users to spend more time in them.

(3) Permeability: This indicator expresses the possibility of pedestrian flow into urban spaces, as the greater the permeability, the greater the vitality. The permeability index is measured by the number of nodes within one hectare, according to the following equation [28]:

$$R/A \geq 1$$

Since (R) is the number of nodes and (A) is the area in hectares. The greater the number of nodes, the smaller the area, the greater the permeability of urban space.

(4) Design speed: This is defined as the highest continuous speed at which vehicles can travel safely on the road when other conditions, such as weather conditions, are good. Many sources indicate that design speed is the most important factor in its impact on engineering design [29]. The specified speed ranges from 40-60 km/h in the main and secondary urban streets, which are designated for car traffic only and are interspersed with pedestrian crossing areas. As for the streets where the movement of the parapet is common with the movement of cars, it shall be less than 15 km/hour, with priority given to the movement of pedestrians and bicycles [30].

## 2.3 The surveillance factors

It is one of the important factors through which vitality is greatly enhanced. This factor can be achieved by imposing surveillance on the spaces. The highest degree of control is by society itself, as shop owners and shoppers impose control and surveillance on the streets. It has been found that crime rates are significantly lower in commercial streets with activities that continue for long hours. Technological development has also helped reduce crime by distributing cameras at important street entrances, squares, and entrances to residential neighborhoods. Security personnel have an important role in following up suspicious and dangerous people in various places, especially places that attract activities and users [31]. Therefore, this factor can be summarized by the following indicators [32]:

(1) Community control: This indicator is represented by the people present within the urban space as well as shop and commercial owners, who impose a kind of control over the spaces and reduce the incidence of crime and violence.

(2) Electronic surveillance: This indicator is represented by the number of cameras and electronic surveillance methods that can reduce the occurrence of crimes, as well as traffic signals, and means of regulating movement that reduce run-over accidents, and crowding within the streets and urban spaces that are usually characterized by vitality and density of users.

(3) Security surveillance: This indicator is related to the number of security institutions and the number of security personnel present within the urban space, who work to surveillance impose security, and reduce the occurrence of crimes, theft, and harassment.

## 2.4 The social interaction factors

This factor refers to the time people spend together within

the urban space. It is a measure of the extent of comfort, safety, and security within the space. Interaction ensures that societies accept all social classes and groups. A good space is a space that provides the appropriate environment for these groups to spend as much time as possible. This factor can be measured by the following indicators:

(1) Availability of squares and public spaces: The more the city includes wide and central spaces, the greater the capacity of these spaces to accommodate large numbers of space users, which makes the space characterized by a higher dynamism. The standard estimates that the space required for each person is estimated at 5 square meters, these spaces must be surrounded by attractive uses that provide services to the users of the space [33].

(2) Sense of place: An internal emotional state that enables the user to interact more with the use of urban space. This indicator may be closely related to the availability of buildings and uses that enhance the spiritual connection to the place, such as religious buildings, theaters, and picturesque views [34].

(3) Heritage buildings: The existence of heritage buildings is one of the important indicators that demonstrate the region's antiquity and importance. This means that it has remained steadfast despite the changes in the city and the circumstances surrounding it. It also has a historical value linked to the values and traditions of society. As it sometimes stimulates the establishment of religious ceremonies and ceremonies because it is most often associated with events in the past tense associated with memories of joy or sadness [35].

## 2.5 Activities and functions

Safe environments are characterized by their attraction to various activities and uses. Urban spaces usually need a variety of uses to provide services to users such as commercial, recreational, health, and institutional services. The existence of dense residential use makes the urban space more lively, effective, and more effective in terms of use. This factor can be measured by the following indicators:

(1) Diversity of land use: means the number of uses within the unit area. That is, the greater the number and type of uses in the urban space, the space becomes more vital. The multiple land use index can be measured using the Entropy Index [36, 37]. The concept of entropy is one of the concepts associated with the field of thermodynamics and is usually used to measure chaos and disorder. It is also used to measure other things such as inequality, diversity, and urban sprawl. The entropy formula has been used to measure land use mix in suburban USA since 1989. Cervero and Kockelman published in 1997 the entropy index formula in a frequently cited scientific article. The entropy index scores range from 0 to 1. It approaches zero (when there is one use of the land and there is no mixture) and approaches one (when there is a mixture of land uses) [38-40]. The entropy index can measure by the following equation [40, 41]:

$$ENT = - \left[ \sum_{j=1}^k P^j \ln(P^j) \right] / \ln(k) \quad (3)$$

where,  $k$  is the number of uses, and  $P^j$  is the ratio of the area of each type of use within the urban space. The value of this indicator ranges from (0-1). As the diversity is higher the closer the indicator value is to (1).

(2) Area of Blocks to Spaces: This indicator expresses the ratio of the built-up area that constitutes commercial, residential, health, educational, and institutional uses to the space that constitutes green spaces and public open areas. This percentage must be in a state of balance, as studies indicate that the percentage of blocks should range between 70-75% of the total area of the region, to allow the region to include sufficient open urban spaces [42]. This, in turn, may lead to an imbalance in the urban structure in the formation of blocks and spaces, which must be rebalanced during the urban renewal process to reach the percentage specified in the standard to work to increase the urban effectiveness of the urban space.

## 3. EXPERIENCES OF SAFE CITIES ACHIEVED VITALITY

The research will deal with some applied experiences of urban areas in different parts of the world, in which security and safety have been achieved, and which have become vital areas. The measures taken by stakeholders in the field of safety and security to enhance urban vitality may vary in their implementation procedures according to the level of planning units in the city, starting from the street and block level, passing through the residential neighborhood, and ending with the city. Based on what was mentioned, the experiences will be presented at the levels of different planning spatial units as follows:

### 3.1 Cromer Street (street level)

Cromer Street is located in London. The area suffered from drug trafficking, prostitution, vandalism, and burglary, which in turn resulted in poor housing conditions and poor street environments. Specialists have tried to improve the quality of life in the area and reduce crime levels (Figure 1) [43].

Play areas, gardens, and parking spaces have been established for the residents, and are well surveillance, as the apartments overlook them, and they are closed at night. It was planted with low-altitude plants, which improved the environment and security. A gate entrance has been provided for each building. The area has become a mixed land use neighborhood and is now a thriving well-functioning inner residential area, well integrated with mixed uses and open spaces around it. Social interaction is good, as there are meeting places and activities along Cromer Street, centered around shops that serve a community function (Figure 2) [44].



Figure 1. Cromer Street in London



**Figure 2.** Buildings and open space on Cromer Street

### 3.2 Battery Park City (neighborhood level)

The Battery Park City Neighborhood was established during the 1970s as a distinct waterfront neighborhood with a lot of interest and funding. However, by the 1990s, some problems appeared in the neighborhood, especially concerning parks and open squares, as Battery Park seemed deserted and many residents and tourists avoided it, with some problems related to waste emerging. Then the proposed plan for the neighborhood began to be implemented under the values of a vibrant city supported by Jane Jacobs, as residential spaces and open spaces were developed. It has become a successful planning model as a result of the positive transformation in urban renewal. The plan for this neighborhood won the 2010 Heritage Award awarded to it by the Urban Land Institute [45].

Battery Park City Neighborhood in New York City: It is the safest and most secure neighborhood and one of the best neighborhoods for families to live in New York City, due to the low crime rate compared to other neighborhoods in Manhattan. This cozy neighborhood is known for its land-use versatility, with Brookfield Place shopping center and pier, Museum of Jewish Heritage, and Rockefeller Park, as well as ferry trips to the Statue of Liberty and Ellis Island. There are many public schools in it. According to some statistics, people living in the neighborhood reported feeling very safe, without any crime to speak of. The neighborhood is characterized by being pedestrian-friendly, and safe transportation, with a variety of transportation options and easy access (Figure 3) [46].



**Figure 3.** Pedestrian-friendly, safe transportation

In this neighborhood, an advanced plan was followed to make the neighborhood livelier and more sustainable through streets, sidewalks, gardens, a park, and other open spaces. Improving the sustainability of these spaces will improve health and wellness, and make Battery Park City a more

desirable place to live, work, and visit - as well as a safer place to walk around and cycle. To improve the overall quality of life. This plan has focused on broader health and environmental quality issues in Battery Park, namely: quality and vitality in place, biodiversity, environmental surveillance, and data exchange, active and efficient transportation, and availability of electric vehicle infrastructure (Figure 4) [47].



**Figure 4.** Location of vital open spaces between buildings

### 3.3 Public space in An-Najaf traditional city (city level)

The traditional city of Najaf represents one of the important historical Iraqi cities, carrying many spiritual and religious values. These religious values, in addition to the social interaction and harmony between space users in this city, have led to a great deal of safety, in addition to some physical measures related to city planning [48, 49].

An-Najaf traditional city is considered one of the safest cities in Iraq, as it is distinguished by some features that support security and safety. It is also characterized by its vitality due to the religious, tourism, and commercial activities that the city provides. The city includes the shrine of Imam Ali, the fourth caliph of the Muslims (Figure 5) [50].



**Figure 5.** Vital open spaces An-Najaf traditional city

The city contains a central public space containing the shrine of Imam Ali, which is the only public space at the city level. This space is surrounded by a fairly high density, which provides vitality in the place most of the time [51]. This space communicates with the surrounding area through several streets and from different directions. Therefore, the space is well connected with its surroundings. In the vicinity of public space, there is also a good rate of diversity in land uses, therefore people are present in this space at all times (Figure 6) [52].



**Figure 6.** Center open spaces An-Najaf traditional city

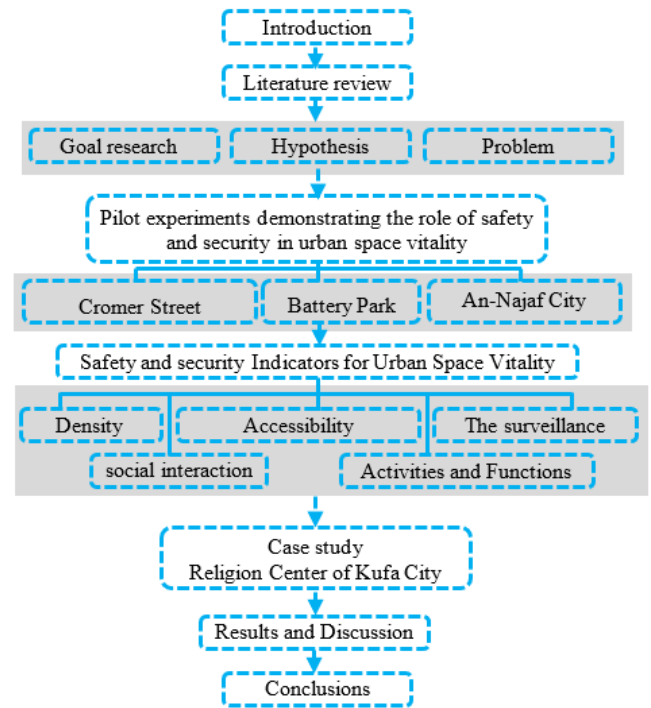
These experiences were chosen as they came from different urban contexts. The first experience (Cromer Street) was a bad area in terms of security and safety, so it was rejected, but due to many planning and design measures undertaken by the Municipality of London City, it turned into a safe urban area and vitality flourished in it. One of the most prominent actions undertaken by the London Municipality is the application of mixed land use and the provision of green spaces that are well surveillanced by the residents because the apartments of the residents overlook the green spaces. It also provided many places for meetings and social interaction. The Battery Park neighborhood in New York City is characterized by the presence of many attractive activities that formed landmarks in the neighborhood. It also provides a pedestrian-friendly environment through safe paths and a plurality of transportation options with a diversity of land uses. As well as interest in issues that support environmental and health quality. As for the experience of the public space in An-Najaf traditional city, although the security situation in Iraq is fragile in general and at many times, this region is characterized by security, safety, and vitality. The reason for this is due to the presence of the shrine of Imam Ali, which gives a unique spiritual state, as well as the existence of homogeneity and social interaction between the users of the space. The diversity of land uses, the availability of pedestrian paths, and the multiple entrances to the space provided more security and vitality.

#### 4. METHODOLOGY

After reviewing the literature on safety and security and its relationship to the vitality of urban space, the research problem, objective, and hypothesis were determined. Then the research identified the security and safety factors and indicators that contribute to enhancing the vitality of the urban space. The research relied on the analytical descriptive approach by collecting data from the relevant departments and institutions in Kufa City, represented by the Municipality Directorate, the Urban Planning Directorate, and the Kufa Environment Directorate. As well as field survey. The data collected dealt with historical information about the study area, location, and area, type and number of uses of the land, type, and number of heritage buildings, ease of access in the area, type of means of transportation used in it, as well as the psychological and emotional aspects collected through the questionnaire form. Some mathematical equations were used to measure and analyze quantitative indicators based on the limits imposed by these equations while extracting percentages for the

questionnaire form.

In the next part of the research, the religious center of Kufa will be studied and analyzed, according to the indicators derived from the theoretical framework (Figure 7).



**Figure 7.** Research methodology

#### 5. CASE STUDY

The study area was chosen, represented by the central urban space confined between the Kufa Mosque and the shrine of the companion Maytham Al-Tamar. This region constitutes the religious center of the city of Kufa [53]. The city of Kufa is one of the important ancient Iraqi religious cities, and it is the center of the Kufa district. Administratively, it belongs to Al-Najaf Governorate, at a distance of 10 km northeast of Najaf, in the Middle Euphrates region, south of the capital, Baghdad, and is about 156 km away from it (Figure 8). The city is located on the right bank of the Euphrates River. It has a population of more than 20 thousand people [54]. Also, the city's population is constantly increasing, due to the presence of important religious monuments within the city, which are the Great Kufa Mosque and Al-Sahla Mosque, in addition to a large group of shrines and other graves (Figure 9) [55].

The religious center of Kufa City has an area of 117 hectares. The center is bounded from the north by Kufa-Najaf Street, from the south by Al-Safir Street, from the east by Kufa Cement Factory Street, and the south by Maytham Al-Tamar Street. The religious center includes several different and varied uses. Most of the space users go to it for religious purposes, in addition to the presence of a market near the Kufa Mosque, where shoppers go for shopping purposes. It is worth noting that some families use the green urban space for entertainment, travel, and eating meals at times.

The city of Kufa contains many urban spaces, which could constitute a knowledge gap to study the issue of the vitality of urban spaces. A sample representative of the urban center of the city of Kufa was taken for the study because it contains a set of indicators that have been derived from the theoretical

framework to study the effectiveness of the urban space of the city center.

This center was chosen because it is one of the most secure and safe areas in the city of Kufa, as well as the spiritual and religious aspects and the sense of place. Movement within the urban space is for pedestrians only, with some means of mass transportation for the elderly, which are powered by electric motors, as they are environmentally friendly. Allocating space for environmentally friendly and sustainable media has made it safer. There have been no crime, violence, harassment, or run-over incidents in the study area for many years. Figure 10 shows the central urban space and the modes of transportation it contains, as well as determining the percentage of space allocation for each mode.

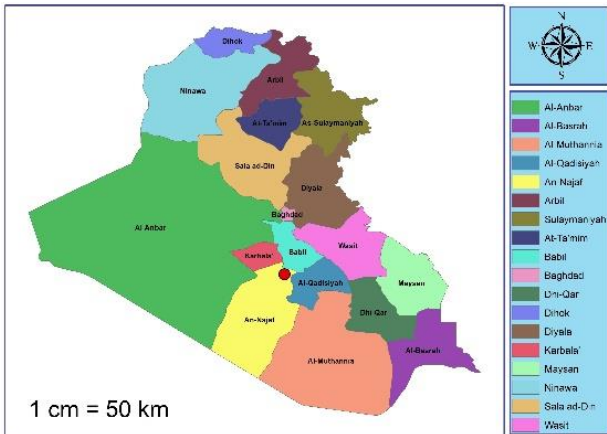


Figure 8. Najaf Governorate in Iraq

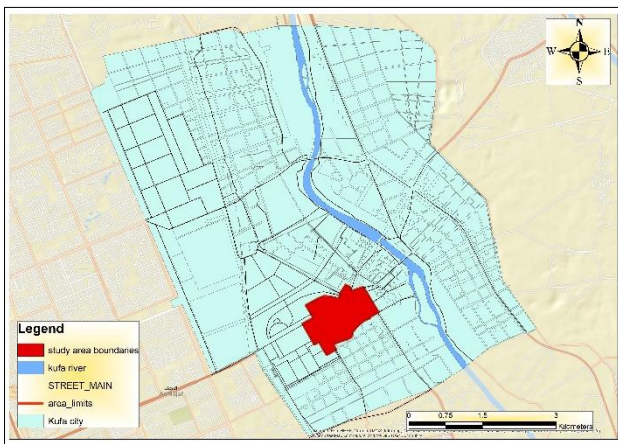


Figure 9. The religious center of Kufa City



Figure 10. Central urban space

Figure 11 in section A1 shows the proportions of spaces allocated for each mode of transport. The percentage of the area designated for pedestrians constituted 48%. This percentage is represented by the area allocated for sidewalks on both sides of Kufa - Najaf Street. The private transport area accounted for 52%.

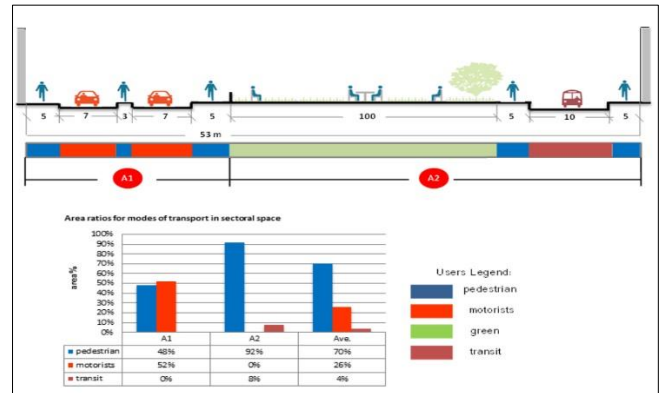


Figure 11. A section of the open space of the religion center and the street Kufa-Najaf

As for Figure 11 in Section A2, the proportions of areas allocated to each mode of transport within the central urban space. As a percentage of the area, the pedestrians in section A2 made up 92%. This percentage was formed from the area of the sidewalks and the green garden designated for pedestrians and their activities such as places for resting, sitting, and eating. As for the rest of the area of the central space, which is the street that connects the Kufa Mosque and the mausoleum of Maitham al-Tamar, it constituted the area of public transportation and amounted to 8% of the total area, which is allocated for public transportation for the elderly.

## 6. RESULT AND DISCUSSION

### 6.1 Density

Space Users Density Index: The number of visitors ranges between 15,000 and 50,000 per day, according to religious occasions. Sometimes, in the Arbaeen visit, more than 100 thousand visitors per day, and when applying the UDI equation, the results show a value of 0.94%, which is closer to 1, and this indicates the presence of the vitality of the urban place. Note that the area of the space used between the Kufa Mosque and the shrine of Maitham al-Tamar is (53142 m<sup>2</sup>), and the number of visitors daily averages 50 thousand visitors per day throughout the year, as shown in Figure 12.



Figure 12. The density of visitors in open space

Commercial activity intensity index: By using the CDI equation, a result of 0.42% appears, which indicates a lack of commercial activity in the urban space. In addition to not distributing, it properly, the commercial activity is concentrated in only one area, which is around the Kufa Mosque. Note that the commercial activity area is (22579 m<sup>2</sup>), this commercial activity is limited to selling food and sweets, as shown in Figure 13.



Figure 13. Commercial activity in open space

### 6.2 Accessibility

Distance of access to services and other land uses: Through the GIS program, the distance was measured for all services in the study area, as shown in Figure 14.

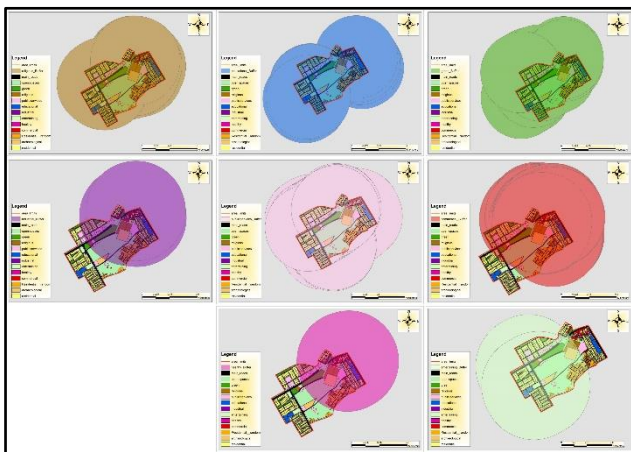


Figure 14. The distance for all services in the study area

It is noted that the access distance is achieved at a rate of 100% for all services. This is a good indicator of the vitality of the urban place.



Figure 15. The supporting structure in the study area

The supporting structure: Through the field survey of the study area and observation, it was noted that the paving materials are good and environmentally friendly, with good lighting. However, the study area lacks seating and fountains, as shown in Figure 15.

This will harm the vitality of the urban space in terms of rest and motivate users to spend more time in it.

Permeability: By applying the permeability equation, the result appeared to be 0.23, which is smaller than 1. This needs to increase the number of nodes to increase the permeability of the urban space, noting that the number of nodes is 5, as shown in Figure 16.



Figure 16. The permeability in the study area

Design speed index: In the study area, there are three main streets, which are (Kufa-Najaf Street, Maitham Al-Tamar Street, and Cement Factory Street), as shown in Figure 17. The speed on Kufa-Najaf Street is from 60-80 km/h, while the other two streets are from 40-60 km/h, all of which are designated for vehicular traffic. The street that connects the Kufa Mosque with the shrine of Maitham al-Tamar and passes through the urban space under study is mainly intended for the movement of pedestrians, and special vehicles such as fire engines, immediate ambulances, and small cars for transporting visitors pass, and the designed speed is 15 km/h (Figure 17).

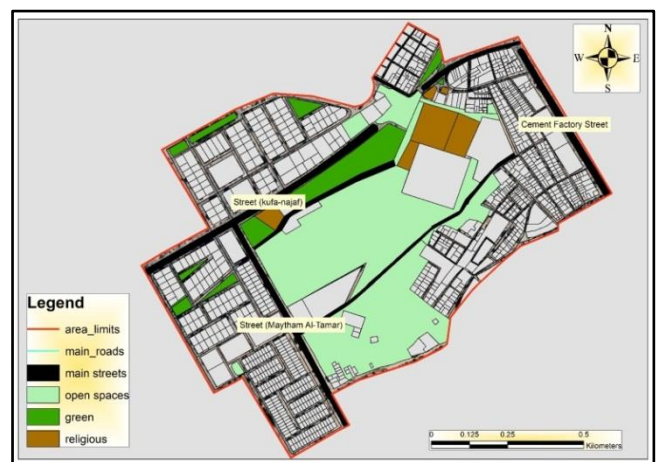


Figure 17. The three main streets in the study area

### 6.3 The surveillance

Community surveillance: As mentioned previously, the



urban space under study is vital in terms of the density of people in it, due to the high demand for visitors throughout the year, in addition to the workers in the shops, whose number is estimated at 500 workers in 190 shops. All of these made the social control in the study area at its highest levels.

Electronic surveillance: In the study area, there are surveillance cameras at the entrances and exits of the urban space, which belong to the Kufa Mosque Secretariat. This is a good thing and helps to impose security and safety control within the urban space, as shown in Figure 18.



Figure 18. The electronic surveillance in the study area

Security surveillance: The presence of security personnel is at the main entrances for visitors to enter from the Kufa Mosque side and the Maitham Al-Tamar shrine side.

#### 6.4 Social interaction

Availability of squares and public spaces: As mentioned previously, the number of daily space users ranges from 15,000 to 50,000, since the standard is 5 square meters per person, the output is (30-100 hectares), which is the required space to accommodate the number of space users. In the study area, the urban space was 21 hectares only, as shown in Figure 19.



Figure 19. The green open space

Sense of place: Through a questionnaire for some space users, it was found that they all feel a kind of place sense, due to the sanctity of the place and the presence of many sacred shrines surrounding the study area. In addition to the historical importance of this place because is associated with many important events in Islamic history. Also, popular commercial activity increases social interaction between people, as shown in Figure 20.



Figure 20. The street led to the historical Islamic Center

Heritage buildings: Existence of remains of a heritage landmark (Emirate Palace), which is the Palace of Government in Kufa from the time of the Rightly Guided Caliphs until the Abbasid Caliphate period. In addition to the presence of an archaeological area under excavation near the tomb of Maitham al-Tamar. In addition, another landmark is the House of Imam Ali, whose features remained prominent, as well as the Great Mosque of Kufa. All these important landmarks help achieve social interaction in the urban space and increase users, as shown in Figure 21.



Figure 21. The historical Emirate Palace

#### 6.5 Activities and functions

Diversity land use: Using the entropy index equation, the results showed that there is a medium variation in land use in the study area, see Figure 22.



Figure 22. The diversity of land use in the study area

Where the total percentage of attractive uses is 50.78% of the percentage of the total area, and the number of uses that surround the space is 11. After applying the mentioned equation, the result was 0.5, which is considered a neutral degree for the criterion. In the future, it is possible to increase the proportion of land use to raise the standard of vitality of urban space, as shown in Table 1.

Area of Blocks to Spaces: The ratio of the block area to the total area in the study area is 0.44%, which is less than the standard. This indicates a lack of balance between block and space in achieving activities and function. Table 2 shows a summary of the measurement of indicators according to each factor in the study area.

**Table 1.** Percentage of land use

Land Use	Area m <sup>2</sup>	Percentage
residential	240645	20.55
commercial	22579	1.93
industrial	685	0.06
religious	34589	2.95
educational	28452	2.43
healthy	1300	0.11
Green areas	55934	4.78
recreational	12303	1.05
archaeological	44765	3.82
Random housing	81692	6.98
public services	71687	6.12
open areas	283550	24.22
roads	292640	24.99
The total area	1170819	100

**Table 2.** Summary of the measurement of indicators

Factors	Indicators	Measurement Methods	Standard	The Reality of the Study Area
<b>Density</b>	Space user density	$UDI_i = (U_{rsi}/A_i) / \max(U_{rsi}/A_i)$ , $0 \leq UDI_i \leq 1$	0-1	0.94
	Commercial activity intensity	$CDI_i = (GFA_i/A_i) / \max(GFA_i/A_i)$	0-1	0.42
	Distance of access to services and other land	GIS	½ mile	The standard has been achieved for all services.
<b>Accessibility</b>	The supporting structure	Field survey and observation	Providing seating and resting places, fountains, and floors suitable for pedestrian movement.	The paving materials are good and environmentally friendly, with good lighting. The study area lacks seating and fountains.
	Permeability	R/A	$\geq 1$	0.23
	Design speed	Field survey and observation	The speed limit is 40-60 km/h in urban streets designated for vehicular traffic, and less than 15 km/h in common streets that include vehicular and pedestrian traffic.	The speed on Kufa-Najaf Street is from 60-80 km/h, while the other two streets are from 40-60 km/h. The street that connects the Kufa Mosque with the shrine of Maitham al-Tamar is mainly intended for the movement of pedestrians, and special vehicles, the designed speed is 15 km/h.
<b>The Surveillance</b>	Community Surveillance	Field survey and observation	The number of people on the streets and shop owners, the more it is, the more it is surveillance.	- large number of users - a large number of shop owners - Good community oversight
	Electronic surveillance	Field survey and observation	The number of cameras and sensors in the streets and squares. The higher the number the better	There are surveillance cameras at the entrances and exits of the urban space.
	Security surveillance	Field survey and observation	The number of security personnel and institutions present in urban streets and squares	The presence of security personnel is at the main entrances for visitors to enter from the Kufa Mosque side and the Maitham Al-Tamar shrine side.
<b>The social interaction</b>	Availability of squares and public spaces	Field survey and GIS	5M <sup>2</sup> for person	It is supposed to provide an area of 30-100 hectares to suffice the number of users, while the reality is only 21 hectares.
	Sense of place	questionnaire form	Percentage of people who feel a sense of belonging to a place through the	100%

	Heritage buildings	Kufa municipality data and field survey	presence of material and spiritual elements within it. The higher it is the better. The number of buildings that are more than 200 years old and have distinctive shapes and designs linked to the city's history and identity, in addition to enjoying good construction conditions.	There are many buildings of an archaeological nature.
<b>Activities and Functions</b>	Diversity land use	GIS and entropy index equation	0-1	0.5
	Area of Blocks to Spaces	GIS	The block ratio ranges from 70%-75% of the total area.	44%

## 7. CONCLUSION

The safety and security of urban space users are important determinants of enhancing vitality, as this encourages users to use the space, stay in it, and participate together in various activities. One of the most important indicators of security and safety affecting the vitality of urban space is the factor of accessibility and the availability of a pedestrian-friendly environment, as the speed of vehicles must be determined and controlled, as they pose a real threat to the lives of urban users and limit their presence. The activity and jobs in the urban space are basic and important points in the vitality industry. The presence of one of the recreational, religious, or commercial activities acts as a catalyst for other factors and indicators that can contribute to achieving vitality. Density is a critical indicator because it provides a sufficient human presence for interaction, activities, and surveillance of the place. It also serves as a natural protection for the place and gives it the necessary vitality. The research identified some weaknesses in the study area that must be worked on to improve them, for example, indicators (land use, accessibility, commercial activities, pedestrian environment support structures, and green spaces). It was found that it was achieved at low rates within the religious center of Kufa City. Therefore, its proportions must be increased for the vitality to be at a higher level. The research recommends studying the relationship of safety and security with feeling and attachment to the place, and it is also possible to study the impact of safety on the concept of well-being and psychological comfort of a person, to determine the factors, indicators, and effective criteria. Safety and security have influences and links to many urban planning concepts. This article opens future horizons for delving into many complex research questions, including, for example: How do concepts of safety and security affect the psychological and emotional aspects of the individual and society? This can be done by studying the relationship that results from the elements of safety and security in the urban space, such as the duration of stay in the urban space, social interaction, sense of belonging, and the relationship between these elements and belonging to the place. How do these concepts affect the sense of connection to and belonging to place? What is the relationship between security, safety and quality of life? Is there a relationship between security, safety and a sense of well-being? What kind of relationship is this and in what aspect of well-being. In addition to studying security and safety with well-being and a feeling of psychological comfort, this can be done considering that safety

and security stimulate the creation of diverse land uses that provide job opportunities for the largest possible number of people, which supports economic well-being, which supports urban vitality and reflects positively on positive interaction in order to achieve social well-being. By providing goods and services that will support environmental well-being because movement in the place will be mainly dependent on pedestrian movement and reducing polluting motorized movement, which will work together with other factors such as good urban design, the mix of land uses and urban compactness to create a sustainable urban environment.

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