



## Research Article

## Strategies For Designing Public Open Spaces in Baghdad City

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## ABSTRACT

Urban design has a significant impact on residents' quality of life and overall well-being. With the rapid expansion of urban areas, it has become imperative to meticulously plan and provide open areas. Implementing sustainable urban design strategies can bolster environmental sustainability, foster social fairness, and boost public health. Iraq faces numerous challenges that impede the creation of safe, accessible, and attractive public spaces for its residents. The aim of this study is to enhance a sustainable urban design plan that will enhance the functioning, accessibility, and visual appeal of open spaces in Baghdad. The researcher uses a questionnaire to collect data from specific respondents with the aim of identifying the limitations that exist in the urban design of open spaces in Baghdad. The study results demonstrate evident limitations from urban, transportation, economic, environmental, cultural, and social perspectives. The survey's findings indicate that the most prominent issues are the intricate arrangements resulting from the addition of new nodes, the diversity of pathways, unfavorable traffic conditions, inadequate land usage, and insufficient distribution of green spaces. The researcher utilizes Kevin Lynch's design concepts to analyze the urban characteristics of the studied region. These principles address the major existing urban issues that need to be considered in the urban design concept to improve the features of the urban landscape in the research region. According to the findings, the researcher suggests several alternatives, such as redistributing land use, developing the wave front area, building new nodes and open spaces, increasing green spaces, and developing the Metro, LRT Train, and BRT.

## 1. INTRODUCTION

Baghdad, like other historical monuments, serves as a prime example of significant growth over the course of decades. The city, located on the Tigris River and in close proximity to Babylon, underwent complex transformation processes in both its physical and cultural environment as a result of natural and political factors. The city of Baghdad boasts numerous urban characteristics that span various historical periods [1].

Throughout the years, Baghdad underwent several alterations and metamorphoses as various kings and dynasties made their impact on the city. The Mongol invasion in the 13th century severely ravaged the city, leading to a prolonged recovery period. Under the rule of the Ottoman Empire, which commenced in the 16th century, Baghdad saw a significant transformation, evolving into a vibrant hub of commerce. This involved the construction of new markets, caravanserais, and mosques. During the 20th century, Baghdad experienced significant transformations as the nation underwent modernization and development. To accommodate the growing population, the city constructed numerous residential areas during the 1950s and 1960s, enhancing its infrastructure with new expressways, bridges, and public transportation networks. During the 1980s, the city suffered extensive destruction as a result of the Iran-Iraq War and the Gulf War, resulting in significant damage to buildings and infrastructure.

The present condition of public areas in Baghdad is intricate and demanding as a result of various social, political, and economic factors. The city is currently undergoing a process of recuperation following prolonged periods of violence. The nation's inadequate security and volatility have hindered the successful implementation of efficient urban development ideas. Nevertheless, there are current initiatives aimed at enhancing the urban layout of public areas in Baghdad.

Currently, Baghdad is experiencing a new period of growth and advancement, characterized by the construction and renovation of numerous buildings, roads, and public areas. Nevertheless, the city continues to confront numerous obstacles, such as a scarcity of

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affordable housing, insufficient infrastructure, and apprehensions over security. Urban design experts in Baghdad are actively tackling these difficulties and striving to develop a more habitable and environmentally-friendly city for the future.

The process of urbanization is a substantial obstacle that impacts the planning of open spaces in Baghdad. Urbanization and industrialization in Baghdad have resulted in land deterioration, specifically soil erosion and desertification. In recent years, the city has experienced tremendous expansion, resulting in a rise in land utilization for residential, commercial, and industrial purposes. This development exerts pressure on the remaining available areas and diminishes the availability of land for the creation of new open spaces that are both sustainable and capable of withstanding the impacts of climate change. Designers must strive to maximize the utilization of available open areas and devise inventive strategies to generate additional ones [2].

Moreover, Baghdad faces a range of challenges that make it difficult to create safe, accessible, and attractive public spaces for residents. Some of these key challenges are lack of basic infrastructure, inadequate funding, security concerns, air pollution, water scarcity, and waste management issues [3, 4, 5, 6].

Ultimately, the present condition of open areas in Baghdad is still being developed, with continuous endeavors to enhance the city's infrastructure, public spaces, and urban planning. Despite the presence of noteworthy projects, the city continues to confront substantial obstacles as a result of the persistent violence and instability in the country. This problem statement advocates for an urban design strategy that gives importance to sustainable design solutions in order to improve the adaptability, functionality, accessibility, and aesthetic appeal of open spaces in Baghdad. Additionally, it aims to promote environmental health and well-being for urban residents.

As a result, this study's objectives are as follow:

Analyze the present obstacles and fundamental factors that impact the urban design of open spaces in Baghdad, Iraq according to various perspectives which are urban, transportation, economic, environmental, cultural, and social Provide a comprehensive set of design principles and recommendations specifically tailored for the urban design

## 2. THEORETICAL FRAMEWORK

This section provides the principles upon which the urban analysis of Baghdad will rely. This analysis will concern with the urban, transportation, economic, environmental, cultural, and social factors.

### 2.1 Urban Analysis (Kevin Lynch Principles)

The methods outlined by Kevin Lynch in his book "The Image of the City" will be employed to assess the spatial cognition and behavioral geography of the research area (Baghdad City). The conceptual skeleton consists of five distinct elements: paths, edges, nodes, districts, and landmarks (refer to Figure 1).

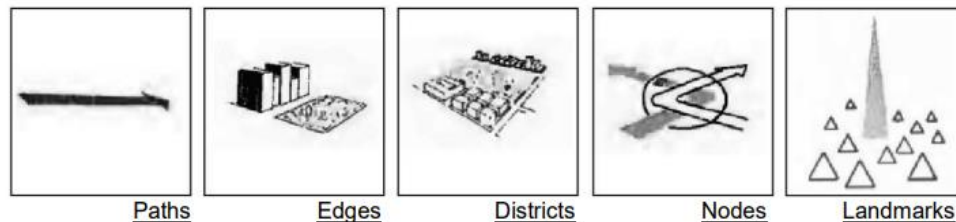


Fig. 1. The elements of city image according to Kevin Lynch [7].

These five elements are described below according to [7]:

#### Nodes

Nodes are the specific points of strategic focus that the observer can enter and go to and from intensively. They are primarily defined as junctions, serving as points where transportation routes intersect, cross, or converge.

#### Paths

Paths refer to the routes that an observer typically, occasionally, or potentially travels along. Paths serve as the primary routes for travel inside the city, providing guidance and assistance for people's orientation.

#### Districts

Districts are vast urban areas that are conducive to mental exploration and share common characteristics. Thematic continuities, which may include a wide range of components, determine districts.

#### Landmarks

Landmarks are exterior reference points that are distinct from the observer. They can be more readily recognized if they possess a distinct shape, stand out from their surroundings, and are positioned prominently in space.

#### Edges

Straight components, known as edges, do not function as pathways. Typically, they serve as boundaries between two distinct locations. They serve as lateral points of reference. The edges that exhibit the greatest strength are those that are not only visually noticeable but also possess a continuous form and are impervious to cross-motion.

## 2.2 Importance of Transportation and Accessibility in Urban Design

The rise in urban population entails not only an increase in the number of residents and workers but also necessitates the establishment of additional transportation infrastructure to accommodate the transportation of passengers and goods within the urban transport network. Both the volume of travel and the increasing development in metropolitan areas, along with the distance traveled, primarily drive the rise in travel. A well-managed urban transport system has a significant impact on a city's overall economic and social well-being. Conversely, an inefficient urban transport system can greatly undermine a city's liveliness, competitiveness, and sustainability. The problems arising from insufficient carrying capacity can be attributed to factors such as inadequate transportation infrastructure, poor management of transportation resources, extensive land use, the travel demand model, and vehicle inefficiency. Urban transport operations encompass several tasks related to road travel, including the management of parking places, the establishment of a comprehensive public transport network, and the regulation of urban development [8].

Accessibility refers to the level of convenience with which individuals and businesses may access the specific goods, facilities, and activities they desire [9]. The primary goal of all transportation efforts is to provide access to various sporting activities, excluding riding and tourist trips. This perspective sees the advancement of access opportunities as a collective advantage for society, with the enhancement of mobility serving as a means to accomplish this objective. The traffic viewpoint is a component of the mobility approach, while the mobility perspective is a component of accessibility.

## 2.3 Economic Perspective of Urban Design

The urban environment is a reflection of a city's economic nature and demonstrates the interconnectedness of product manufacturing and distribution. Income and employment are two key aspects that influence a community's economics. Employment serves as a prominent indicator for assessing the economic prowess of a city. It is also a crucial aspect that connects economic variables with the demand for urban areas, ultimately shaping the city's structure. Without a doubt, the economic vitality of city life relies heavily on factors such as the ability to attract capital, the level of income, and the availability of urban employment. Economic growth's geographical outcome is the tangible expansion of the city's structure and physical environment, as well as its ecological system.

## 2.4 Environmental, Cultural, and Social Perspectives of Urban Design

The importance of public open spaces in urban surroundings is crucial in today's constantly urbanized globe. Urban spaces, such as parks, plazas, and green areas, are crucial for improving the quality of life for city dwellers. Public open spaces have a crucial role in bringing people together, enhancing their physical and mental health, strengthening social bonds, supporting environmental sustainability, and driving economic development. This literature study explores the diverse advantages of public open spaces and emphasizes their significance in urban environments [10]. Moreover, the need to develop a more thoughtful and contextually responsive approach to building places drove the evolution of urban design [11].

With the increasing urbanization of the world, the act of cultivating in gardens, parks, and vacant lots is becoming more significant in enhancing people's social and cultural welfare, as it provides community spaces [12, 13]. The ongoing rise in global population highlights the inevitable transformation of our ecosystems and landscapes to better accommodate human requirements, resulting in increased domestication and intentional design [14].

## 3. METHODOLOGY

This study aimed to gather expert perspectives on the urban character distinctiveness, and challenges in Baghdad. The main approach used to collect data is a structured online questionnaire, which is given to a specific group of specialists in the fields of architecture and urban planning.

### 1. Data Collection Tool

The survey was specifically crafted to get comprehensive viewpoints from professionals in the industry. The questionnaire consisted of a set of questions presented in the Likert scale format, which encompassed responses ranging from "strongly disagree" to "strongly agree." The use of a 5-point Likert scale facilitated a comprehensive understanding of the experts' viewpoints about diverse facets of Baghdad's urban planning, including the urban, transportation, economic, environmental, cultural, and social dimensions.

### 2. Participant Selection and Distribution

The poll focused on a certain subgroup of workers who possess pertinent skills. Specialists in architecture and urban planning were invited to participate in the study. A total of 83 experts responded and took part in the survey.

### 3. Survey Design

In order to achieve these objectives, the questionnaire is divided into two main sections. The first section concerns gathering some demographic data about the respondents. The second section concerns investigating the respondents' opinions about the current challenges and crucial factors that obstruct the urban design process in Baghdad. These factors are simply classified into subgroups: urban, transportation, and economic, and environmental factors. Each subgroup has an abbreviation as follow: UF for urban factor, TF for transportation factor, EF for economic factor, and CF for cultural, environmental and social factors.

### 4. Data Collection Process

The survey was disseminated through email and professional networks, targeting a highly interconnected group of specialists in the relevant domains. The approach was intentionally created to be uncomplicated and easily understood, promoting thorough and reflective responses from the participants.

## 5. Data Analysis

The questionnaire responses were quantitatively evaluated to interpret the answers given on a scale. The analysis primarily aimed to discern patterns and consensus among the expert perspectives, thus offering a distinct representation of the collective position on the topic matter.

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Analysis of Urban Factors

There were 10 questions which concerned with urban factors and challenges in the urban design of Baghdad. The descriptive analysis of urban factors showed lower standard deviations which had a value range of (0.8 to 1.1) and this would indicate that most of the respondents had almost consistent opinions (see Figure 2).

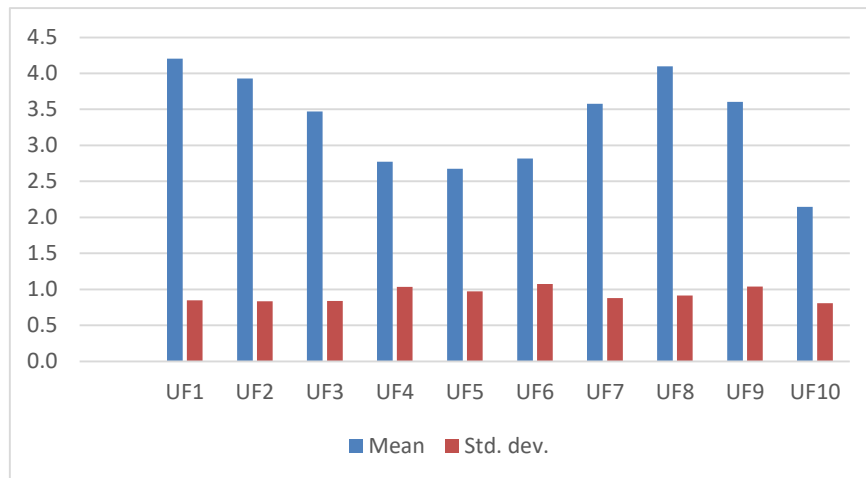


Fig .2. Mean and Standard Deviation of Urban factors.

The results reveal that the absence of proper infrastructure results in disorder and a neglect of the fundamental principles that uphold a civilized society, particularly in the historic sections of the city. This has a detrimental impact on people's quality of life, jeopardizes the preservation of cultural assets, exacerbates social disparities, and contributes to urban turmoil and instability. Tackling these infrastructure obstacles is essential for cultivating a more habitable, sustainable, and fair urban setting in Baghdad. Additionally, the questionnaire emphasizes the varied and distinct characteristics of Baghdad's districts, which contribute to the city's dynamic and complex urban environment. Baghdad city's geometric pattern has had a significant impact on its urban form and structure, leading to the development of new urban networks that enhance its dynamic and intricate nature. Therefore, comprehending the ramifications of this pattern is crucial for efficient urban planning and administration in the metropolis.

The respondents had a neutral viewpoint of the routes in Baghdad city since they are effectively utilized to provide clear visibility of the nodes. Furthermore, the interconnection and arrangement of various regions in Baghdad indicate that although it is possible to move between private and public spaces, there are possibilities to improve the urban environment in order to better accommodate and facilitate such movement.

Concerning the landscape view, the transition from modest, low-rise buildings to massive, high-rise ones disrupts the usual sense of continuity. Furthermore, the incongruity of high-rise buildings with Baghdad's flat topography, particularly in the central area of the city, raises concerns about the visual, historical, and functional harmony of tall structures within the urban environment. Furthermore, the erosion of privacy and the existential uncertainty in public areas underscore the intricate interaction among social, cultural, and urban forces in the city of Baghdad. The results also illuminate the significance of spatial planning, infrastructural provision, and social dynamics within the urban environment.

### 4.2 Descriptive Analysis of Transportation Factors

Figure 3 illustrates that there was a total of 5 questions that focused on transportation variables and the challenges they pose in the urban planning of Baghdad. The descriptive analysis of urban characteristics revealed reduced standard deviations, ranging from 0.7 to 1.0. This suggests that the majority of respondents held rather stable viewpoints.

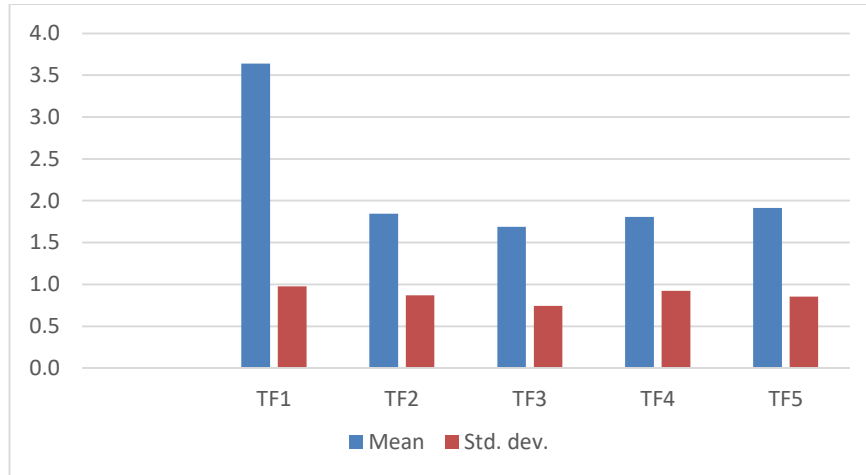


Fig. 3. Mean and Standard Deviation of transportation factors.

The results show that residents in Baghdad do not have specific routes or lanes designated for them on the main streets. Baghdad, similar to several ancient cities in the Middle East, has experienced significant expansion throughout time without the implementation of comprehensive urban planning. Consequently, the city's population expansion and transportation needs may have outpaced the development of its infrastructure. The absence of proper planning may result in a disorganized arrangement of streets lacking defined pedestrian routes or lanes.

Furthermore, the respondents expressed dissatisfaction with the favorable state of Baghdad's traffic features, such as tunnels and traffic lights. The dispute over the status of traffic aspects in Baghdad presumably stems from a mix of observable factors such as infrastructure maintenance, traffic congestion, safety concerns, views of government inefficiencies, and comparisons with international standards. Also, the car and bus stations in Baghdad are not systematic and the traffic paths are not well organized and not distributed efficiently in Baghdad city.

Furthermore, a dispute emerged regarding the comfort level and financial feasibility of public transit in Baghdad. This arises from a confluence of issues such as vehicle quality, safety apprehensions, restrictions in the route network, cost-effectiveness, difficulties in infrastructure, the impression of ineffectiveness, and cultural influences.

#### 4.3 Descriptive Analysis of Economic Factors

Figure 4 shows that there was a total of five inquiries that specifically addressed economic variables and the difficulties they present in Baghdad's urban development. The descriptive study of urban characteristics showed decreased standard deviations, ranging from 0.79 to 1.07. These findings indicate that most participants maintained consistent perspectives.

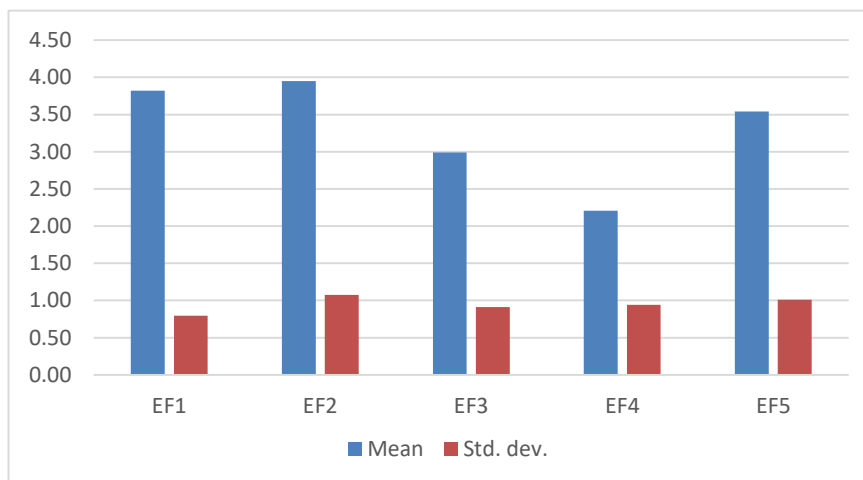


Fig. 4. Mean and standard deviation of Economic factors.

The results indicated a consensus that achieving equilibrium between economic and residential factors will be crucial for restructuring the areas within the ancient city center. Attaining equilibrium between economic and residential considerations is vital for restructuring the interior spaces of the historic city center of Baghdad. It promotes urban revitalization, fosters community development, maximizes efficient resource use, encourages sustainable expansion, and preserves the region's unique character, eventually improving its livability and vibrancy.

Furthermore, converting the housing function into a commercial type has a negative impact on Baghdad's historical section. Ensuring the preservation of these regions' residential nature while facilitating suitable commercial activities is critical for upholding the distinctive allure and authenticity of Baghdad's historical neighborhoods.

Moreover, most of the respondents express a neutral stance toward the economic exploitation of the wave front area in Baghdad, acknowledging the presence of commercial efforts. The neutral position on economic exploitation of the wave front area in Baghdad indicates a nuanced viewpoint within the sample. It recognizes the existence of commercial initiatives but refrains from making a judgment on their overall economic effects and consequences for the local community and environment.

The findings indicate that there is a discrepancy in the effectiveness of land use in traditional marketplaces in Baghdad. This disagreement acknowledges the presence of obstacles and the potential for improvement in these significant economic and cultural centers.

#### 4.4 Descriptive Analysis of Environmental, Cultural, And Social Factors

There were 10 questions that concerned urban factors and challenges in the urban design of Baghdad. The descriptive analysis of urban factors showed lower standard deviations, which had a value range of 0.79 to 1.1, and this would indicate that most of the respondents had almost consistent opinions (see Figure 5).

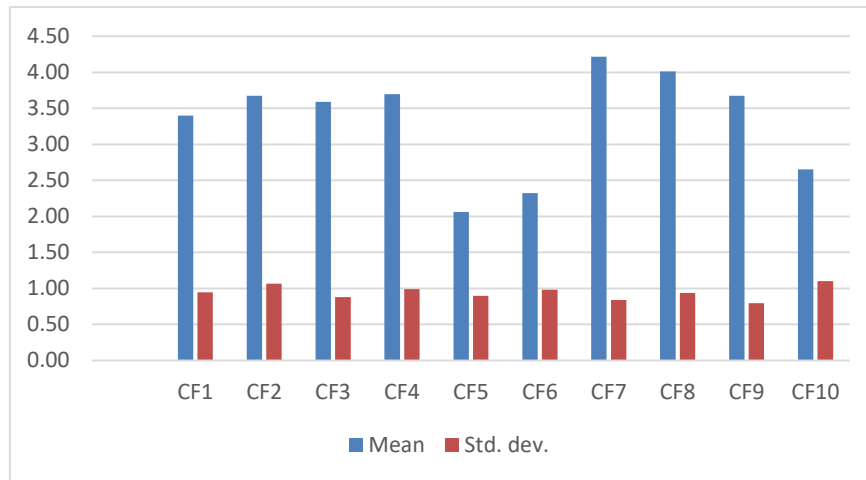


Fig. 5. Mean and standard deviation of Environmental, Cultural, and social factors.

The findings demonstrated that the existing infrastructure within a city contributes to the advancement and enhancement of an urban setting that effectively fulfills its inhabitants' social, economic, and environmental needs. Moreover, the respondents consider the open space as an essential and integral part of the urban fabric is critical for both informing and guiding cultural heritage management. Also, reorganizing the urban elements based on spatial hierarchy, land utilization, building regulations, and the promotion of human activities is the consensus for improving urbanization's social aspects.

Moreover, there are difficulties in connecting the central historical area of the city with the surrounding periphery growth. Furthermore, the dispute regarding the effectiveness of the allocation of green spaces around the urban area of Baghdad municipality highlights concerns about unequal availability, restricted accessibility, inadequate size and quality, urbanization pressures, lack of amenities, and environmental deterioration.

The majority of respondents express their disagreement over the efficient utilization of historical landmarks in the urban planning of Baghdad city. Furthermore, Baghdad must reconfigure its spaces in accordance with its historical context, urban structure, policies and regulations, adaptive reuse, and new roles. This highlights the significance of thorough and all-encompassing urban planning.

Furthermore, insufficient supervision and dedication to limiting the pace of urbanization to conform to traditional patterns are evident. The statement emphasizes the necessity of implementing measures to ensure compliance, investing in infrastructure, including the community, and undertaking initiatives to enhance the ability to support urban development that is both sustainable and respectful of cultural values. Furthermore, it is crucial to prioritize the integration of traditional knowledge, cultural values, and community preferences into urban planning and design procedures. Moreover, a significant proportion of the sample's viewpoints lean towards neutrality on the notion that the current architecture in Baghdad city prominently showcases the historical and cultural significance of the city. The impartiality about



the viewpoint that the current architecture in Baghdad city is notable for its historical and cultural significance demonstrates the intricacy and subjectivity of evaluating architectural heritage in a continuously evolving urban setting.

## 5. CONCLUSION AND RECOMMENDATIONS

This study involved distributing a questionnaire to individuals with experience in the architectural industry. The aim was to identify the elements that influence urban design in Baghdad. The questionnaire pertained to the factors associated with urban analysis: transportation, economy, and culture. These characteristics will aid in identifying the challenges faced in the design of open space in Baghdad. The survey indicates that the study area has several issues, as follows:

### **From the urban perspective,**

The lack of infrastructure leads to chaos and a loss of focus on maintaining the meaning of civilized life.

The geometric pattern created new nodes and urban networks which led to a growing complex structure.

The pathways are not fairly homogenous and aren't clear enough.

The pathways are not exploited efficiently to give the clarity to the presence of nodes.

The areas are not organized in a way that makes it easier to move between private and public areas.

The privacy has started to disappear and converted to publicity, and public spaces are still looking for their identity.

High-rise buildings don't seem to fit in with the flat landscape around them.

The activities are not compatible with the available spaces.

### **From the transportation perspective,**

There are no designated paths or lanes for residents on the main streets.

The condition of traffic elements is not good such like tunnels and traffic lights.

The car and bus stations are not systematic.

The traffic paths are not organized and distributed efficiently.

The public transportation is not comfortable and economic.

### **From the economic perspective,**

Changing the housing function to commercial type has an adverse effect on the historical part of the study area.

The wave front area is not fairly economically exploited with the existing of commercial initiatives.

The land use of the traditional markets is not efficient.

### **From the environmental, cultural and social perspective,**

There are challenges to bridge the historical heart of the city with the peripheral development that surrounds it.

The distribution of Baghdad municipality green areas surrounding the urban area is not efficient.

Based on the responses from the disseminated questionnaire, the examination of the study area identified several issues in the urban, transportation, and economic aspects. Therefore, the researcher provides recommendations in order to address and improve these difficulties based on Kevin Lynch principles and the other factors discussed in the theoretical framework section, as outlined below:

In order to facilitate the incorporation of both existing and new activities, the property will be restructured to maximize its utilization. This will need analyzing the level of acceptability of the current usage and its compatibility with other usages.

Commercial usage involves the transfer of various activities and functions from the specified study area, particularly converting warehouses and wholesale markets into retail stores and exhibition offices, particularly along the riverfront.

Develop open and environmentally-friendly areas, and expand the number of parking spots in addition to the current parking capacity, in accordance with the population size.

Enabling the linkage between various marketplaces and physical sites, such as nodes and open areas.

Development of the area along the river.

Establishing inclusive cultural institutions and platforms with the objective of converting them into widely accessible centers of knowledge.

Creating an underground parking facility equipped with shelves that are controlled electronically using a hydraulic system.

The implementation of the Metro, LRT Train, and BRT systems will significantly improve transportation and accessibility in the region.

Ultimately, the suggested remedies will contribute to the improvement of biodiversity, aesthetics, and the promotion of social interaction.

Finally, the researcher suggests conducting a case study investigation of a specific region in Baghdad, focusing on the chosen viewpoints.

This will expand the reach of the intervention to include more public spaces in various districts of the city.

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### **Conflicts Of Interest**

The author declares no conflict of interest in relation to the research presented in the paper.

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