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Enhancing Public Health Through Sustainable Urban Design: An Examination of Transportation and Green Space Integration

Hussein Alaa Al-Ansari, Ahmed Shamkhi Al-Khafaji*

Faculty of Physical Planning, University of Kufa, 54001 Al-Najaf, Iraq

* Correspondence: Ahmed Shamkhi Al-Khafaji (ahmeds.alkhfaji@uokufa.edu.iq)

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Abstract: In the pursuit of urban sustainability, the incorporation of design elements conducive to public health, safety, comfort, and well-being is investigated within this study. Focusing on Kufa City, Iraq, significant indicators of urban design are identified that may contribute to the enhancement of human health. Among these, multiple modes of transport, walkability, cycling infrastructure, and the promotion of green spaces are emphasized. An examination was conducted within three distinct urban spaces in Kufa City, each representing a different spatial level to provide a comprehensive reflection of the city's design. It was found that the current design does not generally support public health, characterized by an overwhelming dependence on private automobiles and a lack of provisions for walking and cycling. Variations were observed across different spatial levels, with the sectoral and neighborhood levels containing parks that offer comfortable and safe pedestrian paths and green spaces that potentially ameliorate the overall atmosphere. Such provisions were found lacking at the regional level. The findings illuminate key areas for intervention and serve as a valuable reference for urban planners seeking to promote public health through the strategic design of urban spaces. In maintaining consistency with professional terminology used elsewhere in this article, the selected terms are carefully employed to articulate the complex interplay between urban design and public health. The expanded content provides a richer understanding of the subject while preserving originality and adherence to academic rigor.

Keywords: Public health; Urban design; Sustainable cities; Walkability; Cycling space

1 Introduction

The evolution of sustainable cities has been shaped not as a random development but as a deliberate response to the intricate blend of economic, environmental, and social needs. In opposition to modern trends that tend to disintegrate urban spaces, the inception of these concepts has led to an increased reliance on private cars, expanded urban footprints, and diminished opportunities for walking and cycling. Consequently, such developments have contributed to environments that are more susceptible to pollution and less conducive to physical activity, aspects detrimental to public health [1–3].

In the realm of urban planning, a profession that has notably been associated with fostering public health, various initiatives emerged during the 19th century. These include the reformations in housing, the establishment of innovative urban water supply and sanitation systems, as well as the strategic design of parks and playgrounds. The relationship between urban planning and public health, as revealed by historical evidence, was instrumental in rescuing cities and their inhabitants from a possible state of spatial disarray and widespread disease. Such observations accentuated the paramount need for urban design practices that prioritize the meticulous organization of relationships between blocks and spaces, including the structure of movement paths [4, 5].

A recurring theme in urban design literature is the importance of promoting connectivity between blocks and spaces to foster pedestrian movement [6]. This connectivity is recognized as a vital strategy for reducing obesity and heart diseases, enhancing body circulation, and contributing to mental and physical well-being. Additional research underscores the importance of strengthening the relationship between movement pathways and their interconnectedness with diverse land uses and moderate population densities. Such a relationship is considered essential in

augmenting physical health rates and stimulating a variety of transport modes, particularly mass transportation and bicycles, in urban areas [7].

Furthermore, the literature sheds light on urban design's role in identifying suitable locations for green and open spaces, as well as public recreational areas. The deliberate selection and design of these places as restful and enjoyable landscape elements contribute to the city's overall aesthetics [8]. Through visual and physical integration of green spaces, coupled with appropriate seating and lighting, these areas serve as vital lungs for the city. They present essential sources for promoting community health by offering a clean, ecologically balanced environment enriched with plants and natural beauty [9].

Research studies such as those conducted by Alrobaee et al. [10] have explored the complex interplay of urban planning and policy methods in achieving safer cities. Their findings highlight the fight against crime and the reduction of traffic accidents by identifying key features and specific indicators that directly impact urban security. Similarly, investigations by Korshunova et al. [11] into sustainable urban mobility have focused on enhancing accessibility across the city, emphasizing the significant roles of walking and cycling. Rathod and Wagner's [12] examination of human comfort and psychological well-being within urban areas further adds to the discourse by evaluating the relationship between physical structures and their influence on positive and satisfactory human sensory experiences.

In conclusion, an extensive review of these multifaceted studies reveals a strong focus on aspects that elevate public health, urban mobility, accessibility, comfort, and overall well-being through thoughtful urban design. The present study seeks to build upon this foundation by addressing an identified gap in research: the lack of specific indicators of urban design that can be harnessed to promote public health comprehensively. Through an exploration of relevant urban design indicators, this research posits that they hold a vital role in the pathway towards a healthy urban society.

2 Health of Society Indicators

2.1 Human-Oriented Transportation in Sustainable Cities

In the context of urban development, the concept of Sustainable Cities, which prioritizes human needs, has emerged [1]. The emphasis on human-oriented designs leads to an increased focus on modes of transportation that support human mental and physical health. Table 1 presents a criterion for the average area allocated to each mode of transport within urban streets, as illustrated through global examples:

Table 1. Proportions of modes of transport within human-oriented urban streets

	Case Study	Proportions of Various Modes of Transportation within the Total Street Area Following the Redesign			
					
1	Fort Street, Auckland, New Zealand	69%	15%	0%	16%
2	Van Gogh Walk, London, United Kingdom	51%	18%	0%	31%
3	Bourke Street, Sydney, Australia	36%	14%	27%	23%
4	St. Mark's Road, Bangalore, India	45%	11%	19%	25%
5	Second Avenue, New York City, USA	30%	11%	46%	13%
6	Götgatan, Stockholm, Sweden	36%	40%	12%	12%
7	Swanston Street, Melbourne, Australia	56%	17%	27%	0%
8	Boulevard de Magenta, Paris, France	47%	11%	23%	19%
9	Avenida 9 de Julio, Buenos Aires, Argentina	54%	0%	14%	32%
10	A8ernA, Zaanstad, The Netherlands	81%	7%	4%	8%
11	21st Street, Paso Robles, USA	43%	30%	0%	27%
12	Jellicoe Street, Auckland, New Zealand	63%	0%	15%	22%
13	Queens Quay, Toronto, Canada	49%	11%	21%	19%
	Ave.	**51%**	**14%**	**16%**	**19%**

According to the presented data, various modes of transport are considered, with a heavy reliance on walking, cycling, and minimizing the use of private cars [13–16]. An analysis of 13 urban streets redesigned to be human-oriented across the globe demonstrates the average proportion of spaces allocated to each mode [17].

2.2 Walkability

Walkability refers to the degree of support and encouragement given to pedestrians by ensuring comfort, safety, and connectivity to diverse destinations within a reasonable time frame and effort [18–21]. By providing visual diversity for journeys and reducing congestion, reliance on walking has been shown to have a low environmental impact, social value, recreational value, and an enhancement of mental and physical health. A range of considerations must be addressed to achieve a walkable environment, as detailed in Table 2 [22, 23].

Table 2. Indicators of urban design to promote society's public health

Characteristic	Indicators		Measurement Methods	Standards
City's humanization	Multiple modes of transport	Walking	The ratio of its area to the total area	(51%) in urban streets (91%) in public squares or parks
		Cycling		(14%) in urban streets (9%) in public squares or parks
		Public transport		(16%) in urban streets
		Private transport		(19%) in urban streets
	Walkability	Clarity of the path	Field survey	Pathways should be designed to be barrier-free and continuous, adorned with consistent signage and maps, utilizing a universally comprehensible visual language that can be understood across diverse global contexts.
		Path width	Measuring bar	The width of the path should be no less than 1.8 to 2 meters, ensuring sufficient space for two individuals using wheelchairs to pass alongside each other.
		Path safety		The pathway is delineated by a barrier to inhibit vehicular access, and pedestrian pavements are elevated to a height not exceeding 15 cm.
		Multiple path speeds	Field survey	Speeds on the pathway are observed to vary between 0.3 m/s and 1.75 m/s, or 1 km/h to 6 km/h, accommodating individuals walking with the assistance of sticks, those using wheelchairs, owners of skis, and runners.
		Safe and accessible crossings	Field survey + Measuring bar	Elements such as pedestrian signals are provided, along with concrete paving strips specifically designed for the visually impaired and blind. Additionally, slopes are constructed with non-slip materials, adhering to a maximum gradient of 1:10 (10%), with an ideal inclination of 1:12 (8%).
	Cycling	Easy access route	Field survey	Signage and traffic lights serve as indicative items, guiding and regulating the flow of traffic.
		Path safety	Measuring bar	Green spaces or concrete dividers, each with a width of one meter, are employed to create physical separation.
		Multiple path speeds	Field survey	Speed limits are delineated according to user type, with children and families restricted to less than 10 km/h, cargo carriers to less than 20 km/h, other passengers to a limit of 20 km/h, and professional cyclists permitted to exceed 30 km/h.
		Interconnection distance between stations	Field survey	"Within a one-square-kilometer area, 11 stations are strategically located, each with a distance of 300 meters from the others, or roughly a 5-minute walk apart.
		Model station dimensions	Measuring bar	A minimum length of 12 to 15 meters, and a width ranging from 2 to 2.5 meters, are stipulated.
	Promotion of green spaces	Greening space	GIS	A designated 20% to 40% of the total area is allocated for open space.
		Type of plant material	Field survey	Materials should be selected with consideration for both aesthetic and functional purposes, prioritizing those suitable for the local environment and adaptable to the climate. The use of barbed, toxic, or gaseous materials is to be avoided.
		Distribution of afforestation	Measuring bar	The planting arrangement should be in a straight line along the street, with branches rising at least 2.2 meters above the ground level and positioned at a distance of 1.5 meters from the edge of the sidewalk. The trunk's width must not exceed 0.3 meters, and the vegetation should be situated no less than 0.6 meters from the edge of the sidewalk.

2.3 Cycling

Cycling has been recognized as a significant daily activity across societal segments worldwide due to its importance in social, health, and environmental contexts [1, 24]. Effective operation of this medium necessitates certain considerations, such as designating spaces for cycling within the road that are vertically separated from other traffic. Safety measures include the separation of these spaces by physical barriers like green space or concrete dividers [21, 25].

2.4 Promotion of Green Spaces

Green space has been identified as a vital element in urban public space design, known to improve regional climate, combat pollutants, and temper atmospheric conditions [26]. Additionally, green spaces are essential in providing adequate shade and fostering social interaction and activities that enhance public health.

Table 2 delineates the urban design indicators for promoting public health and the associated measurement methods and standards. The health of society can be effectively gauged through careful consideration of urban design principles. By prioritizing human needs and focusing on walkability, cycling, and green spaces, cities can foster a more sustainable, human-oriented environment. It is vital to align urban development practices with these principles to create a future where both environmental sustainability and human health are central considerations.

3 Methodology

In the pursuit of understanding the concept of Sustainable Cities, a comprehensive review of recent studies was conducted. Through this analysis, the knowledge gap was discerned, and the problem was delineated, culminating in the formulation of the research aim and hypothesis. This led to the identification of the research objective, providing a basis for the methodological approach adopted.

The analytical descriptive approach was chosen, and data were collected from relevant departments and institutions in Kufa City, namely the Municipal Directorate and Directorate of Urban Planning. These data were instrumental in the application of societal public health indicators. Descriptive methods, including field observation and identification, were employed, and the GIS program was utilized to enable precise comparisons with urban design standards. This methodology allowed for an intricate evaluation aligned with the demanding criteria of urban planning and public health assessment.

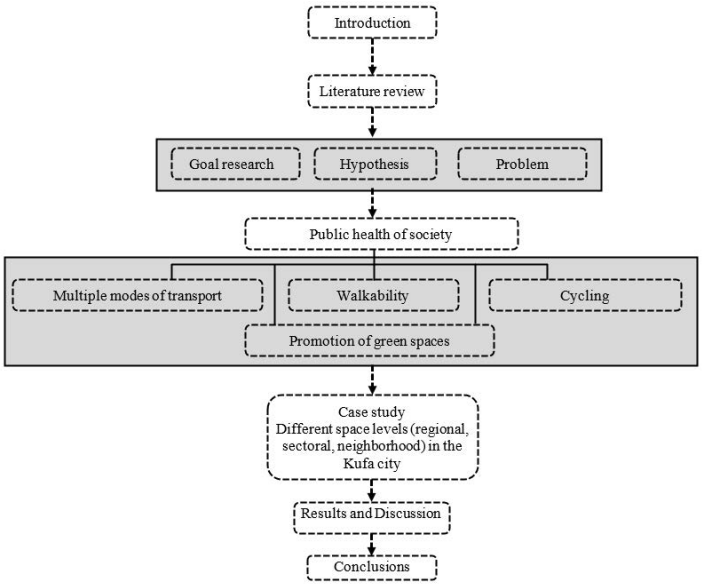

Figure 1. Research methodology

Figure 1 illustrates the methodology followed, detailing the systematic process undertaken to achieve the research objectives. The methodological design ensured that the approach was rigorous and suitable for the study's context, adhering to the standard practices observed in top academic journals. By focusing on passive construction and maintaining consistency in the usage of professional terms throughout, the methodology section aligns with the high standards of academic writing customary in publications such as Nature and Science.

4 Case Study

Situated on the Euphrates River, the city of Kufa is recognized for its religious and cultural significance. Home to the University of Kufa, this ancient city combines various uses and activities within its natural and green landscapes. Despite these unique attributes, the urban spaces of Kufa have been largely neglected, with a substantial portion devoid of human-centric design [27, 28]. These conditions have led to an environment dominated more by vehicular traffic than pedestrians, culminating in spaces that are largely detrimental to human health.

For this investigation, three urban spaces within Kufa were selected as subjects, representing diverse levels of the urban landscape: regional, sectoral, and neighborhood. A systematic examination was conducted to elucidate the existing weaknesses within the study area, as detailed below:

(1) Regional Level: Shatt Kufa Space

• Description: Encompassing 28.4 hectares, this space serves various urban centers both inside and outside Kufa city, lying between a riverfront and constructive area, and including public river edge areas.

• Significance: The location on the Euphrates bestows unique advantages, rendering it an attractive target for urban development. Its proximity to diverse urban centers further emphasizes its importance at the regional level.

(2) Sectoral Level: University's Shoulder Space

• Description: Covering 11.5 hectares, this space functions to enliven a specific sector within Kufa, located near the University of Kufa, and includes sports and family parks, a football stadium, and abandoned spaces.

• Significance: Its close proximity to the University of Kufa imparts special importance, although its potential remains largely unexploited.

(3) Neighborhood Level: Al-Mannabi Space

• Description: Occupying 3.5 hectares, this space focuses on servicing the neighborhood's residents and includes a park surrounded by streets on each side.

• Significance: Its limitation to neighborhood activities and services adds a unique dimension to the study.

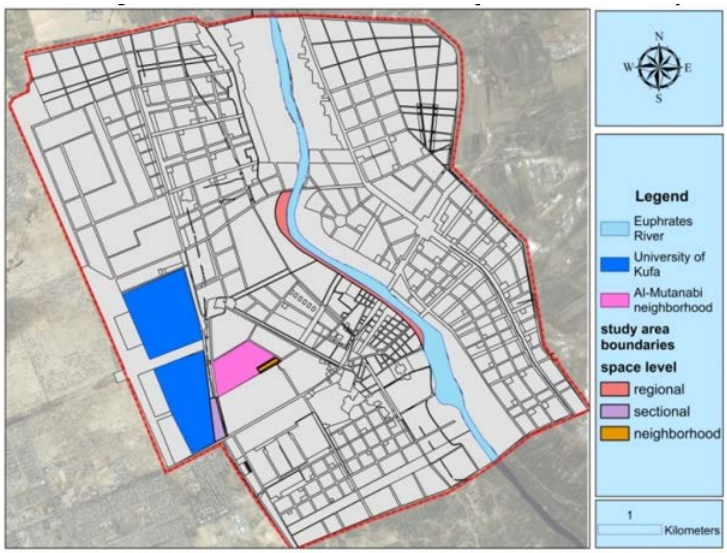

Figure 2. Three urban spaces in Kufa City

Refer to Figure 2 for a graphical depiction of the three urban spaces selected within Kufa City.

This case study offers a nuanced examination of various urban spaces within Kufa, applying indicators derived from the theoretical framework to identify inherent weaknesses. Such a methodology allows for a comprehensive understanding of the interplay between urban design, cultural elements, and human needs, highlighting the unexploited potentials within the city's urban spaces. The diverse selection of spaces at different levels provides a multifaceted perspective, enhancing the depth and breadth of the analysis.

5 Results and Discussion

5.1 Multiple Modes of Transport

The examination of transportation modalities within three delineated urban spaces was performed by quantifying and contrasting the areas designated for each mode. This approach adheres to the human-centric urban standard, favoring pedestrian and bicycle spaces while minimizing the space for private vehicles. The following sections detail the analysis for each of the three urban spaces:

5.1.1 Regional space

The regional space was observed to encompass two distinct ranges: the street range and the river edge area range. Owing to the variable trajectory of the river, the space was segmented into three parts (A, B, C), with area ratios computed for each respective part. Subsequently, average ratios for the whole space were extracted and contrasted with the human-centric criterion.

In the street range, pedestrian space constituted only 12% of the total area, falling below the minimum urban street pedestrian standard of 51%. Conversely, the combined area for public and private transport vehicles accounted for 88% of the total range, exceeding the combined standard of 35%. Within the river edge area, 100% was allocated to pedestrians, thereby meeting the general area standard of 91% (Figure 3).

The regional space demonstrated deficiencies in several aspects, particularly the lack of accommodation for bicycles and an imbalance in pedestrian and vehicular areas, signifying an area unhealthy for human usage.

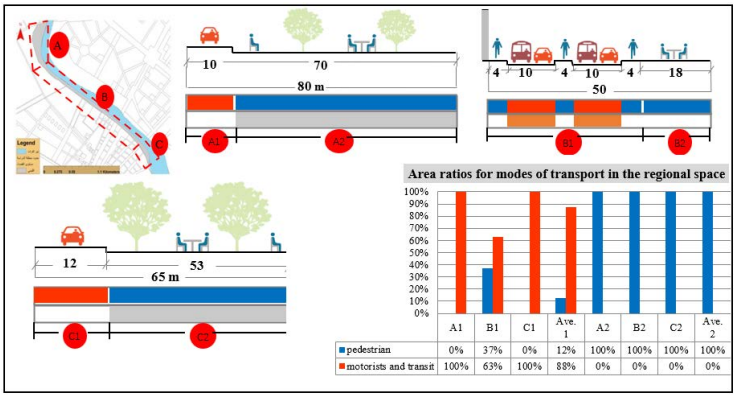

Figure 3. Analysis of multimedia in regional space

5.1.2 Sectoral space

Comprising two ranges, the first being the street range and the second adjacent to the Kufa University wall (University shoulder space), the sectoral space required division into two parts (A, B) due to variations in width from beginning to end.

The pedestrian area in the street range was found to be 31% of the total, below the urban standard. The combined area for private and public transport vehicles in the street exceeded the maximum standard of 35% at 69%. Moreover, the pedestrian space in the university's shoulder area, at 39%, fell below the public space standard of 91%, with 61% of the remaining area being unutilized for any mode of transportation.

These findings reveal that the space within the street and university shoulder ranges failed to meet standards, demonstrating a need for rehabilitation to render them more human-oriented (Figure 4).

5.1.3 Neighborhood space

The neighborhood space, including three ranges such as Metro Street and the chosen Allied Park, the Third Parks, was restricted to walking modes and private transportation, lacking provisions for public transport and bicycles. The pedestrian area in the street averaged 40%, below the minimum urban standard of 51%, while private transport vehicles occupied 60%, surpassing the maximum urban street standard of 19%. The park's range was exclusively pedestrian at 100%.

Such an arrangement within the street area did not meet the standard and was deemed unhealthy for human activity. Conversely, the park's range achieved standards for pedestrians (Figure 5).

The meticulous evaluation of multiple modes of transport across different urban spaces revealed a prevailing imbalance in alignment with human-centric urban planning principles. The insights drawn from this study emphasize the need for targeted interventions and thoughtful design to enhance the liveability and health of urban spaces, in congruence with established standards.

5.2 Walkability

Walkability was investigated as a significant indicator to ascertain whether the selected study areas facilitate an environment conducive to walking, thereby attracting human presence and encouraging physical activity. This parameter was assessed through meticulous analysis of pedestrian pathways and crossings, prioritizing the provision of an unobstructed and safe passage. The areas of focus included path clarity, path width, path safety, accommodation for multiple walking speeds, and safe and accessible pedestrian crossings.

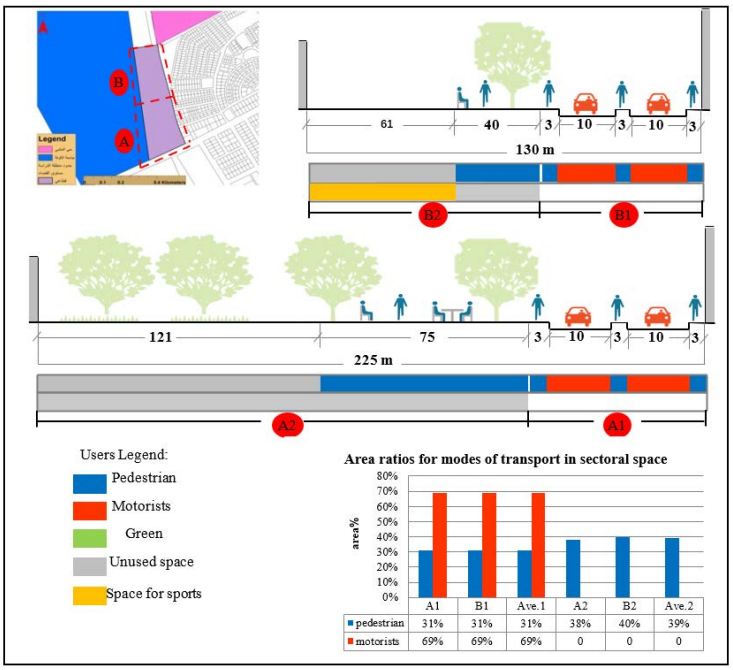

Figure 4. Analysis of multimedia in sectoral space

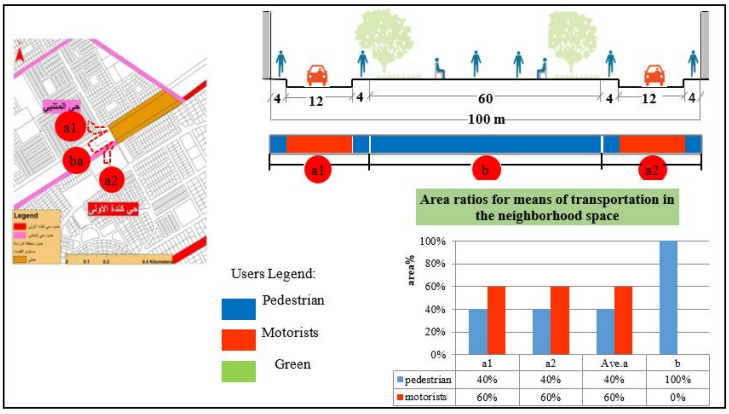

Figure 5. Analysis of multimedia in neighborhood space

Figure 6. Clarity of the path

5.2.1 Clarity of the path

Regional Space: Obstacles were found within the path, compounded by the absence of signage and directional maps (Figure 6).

Sectoral Space: Street pavements were observed to contain obstructions, and indicative maps were lacking. Conversely, park trails were found to be clear, continuous, and inclusive of indicative elements (Figure 6).

Neighborhood Space: Similar to sectoral space, pavements included impediments, and indicative maps were not present. Inside the park, clarity and continuity were maintained (Figure 6).

5.2.2 Path width

Regional Space: A width of 4 meters was measured for the track.

Sectoral Space: Path widths were determined to be 3 meters for street pavements and parks.

Neighborhood Space: Sidewalks were found to have a width of 4 meters, while park interiors were measured at 3 meters.

5.2.3 Path safety

Regional Space: Street sidewalks were noted to be separated by a height of 20 cm.

Sectoral Space: Street pavements were delineated by a height of 25 cm, whereas within parks, the absence of vehicles did not threaten the route's safety.

Neighborhood Space: A height of 20 cm separated the pavements, and no vehicular threats were observed within the park.

5.2.4 Multiple path speeds

Regional Space: No multiple speeds were detected, being limited to the ordinary pedestrian speed of 6-7 km/h.

Sectoral Space: Limited to pedestrian speed on pavements, multiple speeds were only observed within the sports park, accommodating walking at 6-7 km/h and running at 10 km/h or more.

Neighborhood Space: Speed was confined to 6-7 km/h on sidewalks and within the park.

5.2.5 Safe and accessible pedestrian crossings

Across all spaces (regional, sectoral, and neighborhood), the absence of pedestrian crossings was discerned. Guiding elements such as signals and concrete paving strips for the visually impaired were not provided, and ramps for wheelchair users were also lacking.

The findings from the walkability analysis revealed a general inadequacy in fulfilling a person's need for physical activity, thus impacting the potential for physical and mental well-being on the streets. However, within park areas, the standard was observed to be met.

These insights not only contribute to the understanding of urban spaces but also underline the urgent necessity for designing pathways that are accessible, safe, and appealing to pedestrians. The evidence gathered calls for comprehensive urban planning strategies that prioritize human-centered designs, ensuring a vibrant and healthy community. Future research may expand on these initial findings, exploring the socio-cultural implications of walkability and providing a foundation for evidence-based policy-making.

5.3 Cycling

In the study area, encompassing the three selected urban spaces within the public city of Kufa, an absence of support structures for cycling is observed. Neither cycling tracks nor bicycle stations are found to be included in these areas. Despite the recognition of cycling as a sustainable, non-polluting, and energy-efficient mode of transportation, requiring significant spatial allocation and substantial infrastructure investment, its integration within the urban environment appears neglected. The absence of cycling facilities is indicative not only of a missed opportunity to reduce vehicular traffic but also a lack of commitment to fostering human physical and psychological health, which is deemed an essential aspect of mobility.

The deficiency in cycling infrastructure raises questions regarding urban planning priorities and their alignment with global sustainable development goals. Recognizing cycling as a viable and essential mode of transportation is integral to the promotion of environmental stewardship, public health, and enhanced urban living. In the case of Kufa, the apparent disregard for this mode of transport reflects a broader trend in urban planning that may be symptomatic of the challenges faced by emerging cities in balancing modernization with sustainability.

Investigations into the absence of cycling facilities could contribute to a more comprehensive understanding of the underlying barriers and opportunities within the city's urban planning framework. Future research and policy interventions should, therefore, consider the potential benefits of cycling infrastructure, not merely as a transportation alternative but as a multi-dimensional asset that could play a pivotal role in shaping the city's future growth and sustainability. The integration of cycling within the urban mobility ecosystem would be a step towards a more humane and environmentally responsible urban landscape. It is suggested that more robust studies be conducted to

explore the socio-economic and cultural factors that may be influencing the lack of cycling infrastructure in Kufa, with an aim to provide actionable insights for policymakers and urban planners.

5.4 Promotion of Green Spaces

In the examined study area, comprising three distinct spaces, the presence and characteristics of green spaces are observed to vary between different regions. Green spaces are quantified and assessed using three sub-indicators: the extent of greening as a percentage of the overall space area, the type of plant material employed, and the distribution of afforestation within each spatial level. The evaluation of the first two indicators is conducted within the defined spaces, with specific ranges enumerated as illustrated in Table 3.

Table 3. Promotion of green spaces in the study area

Indicator	Regional Space	Sectoral Space	Neighborhood Space
Greening space	54 % of space area (above standard)	20 % of space area (within acceptable limits)	54 % of space area (above standard)
Type of plant material	Suitable for functional and aesthetic purposes, non-thorny, non-toxic, non-invasive, and locally and climatically adapted	Same as regional space	Same as regional space
Distribution of afforestation	Straight line distribution; branch height <2.2 m; distance >1.5 m from sidewalk edge; trunk width <0.3 m; vegetation 0.9 m from sidewalk edge	Same as regional space	Absence of afforestation on the street

Within the regional and neighborhood spaces, greening is found to constitute 54% of the total area, a figure that exceeds the standard threshold. Meanwhile, the sectoral space records a greening area amounting to 20% of the total space, which falls within acceptable limits. In terms of plant material, selections that are suitable for functional and aesthetic purposes are employed, with specific attention to ensuring that they are non-thorny, non-toxic, non-invasive, and adapted to the local environment and climate.

Distribution of afforestation, however, presents more variability across the spaces. While in the regional and sectoral spaces, afforestation is distributed in a straight line with specific measures relating to branch height, distance from the sidewalk edge, trunk width, and vegetation distance from the sidewalk, the neighborhood space exhibits a complete absence of afforestation on the street.

The analysis of green spaces within the three selected areas provides critical insights into urban planning and design, reflecting varying levels of commitment to environmental stewardship and aesthetics. The significant divergence in greening strategies and afforestation distribution warrants further investigation to understand underlying planning principles and their alignment with broader sustainability goals.

Future research could delve into the social, economic, and environmental implications of these greening strategies, exploring how they contribute to urban livability, biodiversity, and climate adaptation. Moreover, understanding the decision-making processes behind the selection and distribution of plant materials and afforestation could inform more holistic and responsive urban planning approaches, fostering communities that are not only aesthetically pleasing but environmentally resilient and responsive to local needs and conditions.

6 Conclusions

Urban design stands as a critical concept in human civilization, fulfilling a range of diverse human needs encompassing safety, public health, comfort, and well-being. In Kufa City, an examination of all spatial levels reveals substantial challenges to human health and well-being. These challenges arise chiefly from a near-total dependence on private vehicles and a corresponding neglect of active mobility modes such as walking and cycling.

A differentiated analysis across the spatial levels of sectoral, neighborhood, and regional areas reveals nuanced disparities. While parks in the sectoral and neighborhood levels have been found to furnish safe and comfortable pedestrian paths, along with green spaces that contribute to a softer ambiance, such attributes are notably absent at the regional level. Moreover, the city's streets were determined to fall short of providing suitable environments for walking, characterized by a lack of clear, comfortable paths and appropriate pedestrian crossings.

The absence of infrastructure to support cycling in Kufa City further underscores the lack of commitment to sustainable and health-friendly modes of transportation. The promotion of walking and cycling as vital components of urban transportation is identified as an imperative for creating healthy urban spaces that are not only less polluted

but also conducive to physical activity. These modes are recognized as essential in fostering a sustainable model of mobility.

This study concentrated on urban design measures aligned with the public health dimension. However, it must be acknowledged that additional facets integral to the broader concept of sustainable cities—such as safety and security, comfort and well-being, and urban vitality—remain unexplored in the present investigation. These areas represent potential avenues for future research and are imperative for the holistic development of urban environments that resonate with the principles of sustainability.

In conclusion, the insights garnered from the analysis of Kufa City shed light on critical shortcomings in urban design that impact not only public health but also the overall quality of life. The identified gaps in infrastructure, particularly concerning walking and cycling facilities, emphasize the urgent need for a reevaluation of urban planning and design principles. A shift towards a more integrated and sustainable approach, that considers all dimensions of human well-being, not only has the potential to transform the urban experience in Kufa City but may also serve as a valuable blueprint for other urban centers grappling with similar challenges.

Emphasizing a multidimensional approach to urban design that encompasses safety, health, and sustainability, the findings of this study underscore the imperative for a paradigm shift in urban planning. Future research should engage with the unexplored dimensions of urban design to craft a comprehensive framework that aligns with the global agenda for sustainable and resilient cities.

Author Contributions

Conceptualization, A.S.A. and H.A.A.; methodology, A.S.A.; software, H.A.A.; validation, A.S.A. and H.A.A.; formal analysis, A.S.A.; investigation, H.A.A.; resources, A.S.A.; data curation, H.A.A.; writing—original draft preparation, A.S.A.; writing—review and editing, A.S.A.; visualization, A.S.A.; supervision, A.S.A.; project administration, H.A.A.; funding acquisition, A.S.A. All authors have read and agreed to the published version of the manuscript.

Data Availability

Not applicable.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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