

The Impact of Pedestrian Streets Design on the Urban Scene of the Iraqi City Center

Saba Salih Shalal¹, Zeyad Ali Ismael², Zainab Hamid Mohson³ & Eman Tahseen Maki⁴

¹Architectural Department , Al Safwa University College , Iraq

²College of Urban Planning , University of Kufa , Iraq

³Department of Architectural Decorating .Middle Technical University, Iraq

⁴Babylon University, College of Fine Art

Keywords: urban scene, pedestrian streets, street furniture, design, pedestrians.

DOI:

[10.11779/CJGE202111.3](https://doi.org/10.11779/CJGE202111.3)

ABSTRACT: Pedestrian streets play a vital and effective role in the visual formation of the urban scene of city centers, including the Iraqi city. These streets are also affected by a number of influences that contribute to the composition and formation of its formal characteristics. The natural and built environment of pedestrian spaces affects the composition and formation of the urban scene, as well as its impact on society and its environment, as represented by social, cultural and civilizational dimensions. This is what the focus of the research is concerned with in the study of pedestrian streets and their impact on the urban scene, so the research problem was (Neglecting the design of pedestrian streets in the Iraqi city), and the research determined the hypothesis (the design of pedestrian streets positively affects the urban scene of the Iraqi city), up to the main objective (studying a set of indicators to ensure the optimal design of pedestrian streets in the Iraqi city), through the study of the Urban scene and pedestrian street design in global cities to be applied to the Iraqi city.

1. INTRODUCTION

The design of pedestrian streets in the city is a reflection of the city's transformation of human attention to provide a comfortable environment for the movement of residents in the city center as paths in which people move through which they can perceive the elements of the urban scene to form a visual image of them, especially because of the poor design and neglect of pedestrian streets in Iraqi cities, which led to its deterioration, it affected the urban scene of the city.

1.1 Urban scene

The urban scene represents the spatial arrangement and visual appearance of the built formations, and expresses the art of relationships that bring buildings together to achieve an urban scene in the city, and that the visual relations between the elements of pedestrian streets have a major role in organizing the urban scene and forming an integrated sensory image of it (1), and that the way in which the elements are organized Pedestrian streets and their interrelationships determine the visual characteristics of the urban scene (2).

Components of the urban scene

The urban scene in general is shaped by the spatial design and the visual appearance of the built and natural formations that the eye sees from the outdoor spaces. The researchers classified the elements of the urban scene into several basic groups, most of whom agreed on some common elements in the formation of the scene "Lynch" classified scene components into: paths, edges, sectors, nodes, and markers. (3) As for "Schulze", he classified them into: paths, nodes, and sectors. (4) There are two basic criteria for the urban scene, the first is the sense of place, and the second is the sense of unity where the city is perceived as an integrated whole and not as separate and unconnected parts. (5) Pedestrian streets will be addressed and designed as an essential and important element in shaping and shaping the urban scene of the city.

2. Pedestrian streets

It is the expected path for pedestrians. It is part of the forbidden road that secures an independent area designated for pedestrians. It works on linking the residential neighborhoods with each other and

connecting them to the elements of the service units, whether they are religious, educational or commercial in the city. Pedestrian streets are designed on the basis of a network of continuous service walkways that connect the houses. (6)

2.1 The importance of pedestrian streets:

It is one of the spaces of social interaction in the urban landscape in the city to create a human dimension that develops a sense of belonging and connection with it. Pedestrian streets have an economic role, whether at the commercial level, as they are considered the area that contains the shops or at the level of the general appearance of the city that attracts tourism. The quality of the public outdoor spaces in the city can be an important economic resource. Many of these stores thrive as the street turns into a pedestrian space that contains a distinctive environment for rest, entertainment and shopping in the city center (7).

2.2 Elements of pedestrian streets:

Pedestrian streets consist of the following elements:

- The zone front is the one that is located next to the line of buildings or real estate, and it is the area where pedestrians interact with the buildings overlooking the sidewalk.
- The zone through the pedestrian is the main area on the track and is an area for pedestrian movement that should be free of obstructions.
- The zone furniture and curb is the area designated for trees, green spaces, kiosks and seating.
- The zone buffer the is the area adjacent to the car lane and its parking spaces. It should contain ramps for people with special needs, often with street lights, traffic lights, parking meters and other infrastructure. It can also be provided with a path for bicycles, as in Figure (1). (8)

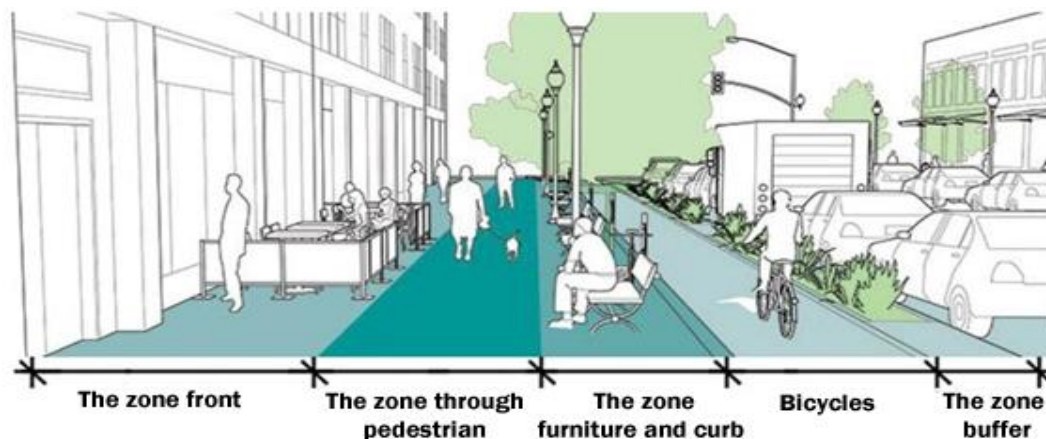


Figure (1) Elements of pedestrian zones (8)

The following table shows the criterion for the distance left for each part of the pedestrian street in city centers:

Table No. (1) shows the ideal distance for each element from the pedestrian street (8)

Street Family	Pedestrian Realm				
	Frontage	Through	Furnishings	Cycle Track ²	Edge ²
Boulevard	0.8	3.5	1.5 - 3.0	2.0	0.5 - 1.5
with Frontage Lane	0.8	3.5	1.8 - 3.0	n/a	0.5
Avenue	0.8	3.0	1.5 - 2.0	2.0	0.5 - 1.5
with Frontage Lane	0.8	3.0	1.5 - 2.0	n/a	0.5
Street	0.5	2.8	1.2 - 1.8	n/a	0.5
Access Lane	n/a	1.8	n/a	n/a	0.5

3. BASIS AND CRITERIA FOR DESIGNING PEDESTRIAN STREETS

The urban aspects are one of the basic components of the design of pedestrian streets, as follows:

3.1. Achieving efficiency in design: The ease of access and clarity of the pedestrian street network can be achieved by designing a movement network with a clear hierarchy of streets starting from the arterial roads connected to the city center to residential streets, and achieving homogeneity between different activities and functions, restaurants and shops are working to fill Pedestrian street with life and leisure spirit, The design of the squares and the selection of their places by placing them, for example, in front of the valuable buildings, helps to confirm the distinctive visual identity of the streets, and the combination of sitting places and cafeterias in the middle of the path provides a sense of the entertainment side and the social spirit of the pedestrian street. (7)

3.2. Achieving a visual image: The spatial harmony is what causes the visual pleasure and is formed in a spatial sequence, and the stimulus is formed to discover it, thus raising the level of the aesthetic image and achieving a high level of visual perception on the main movement axes through: Consistency and harmony between the elements of the architectural furniture on the path, and the modification and treatment of building facades to suit the original architectural pattern and style of the city, and achieving harmony between the urban scale and the human scale, meaning the possibility of achieving clarity and visual perception of the path, using a set of vocabulary and attributes to give it an independent identity.(9)

3.3 Achieving a safe pedestrian environment: It is necessary for sidewalks and their intersections to provide a safe environment for all users, and this is achieved through:

First: The design of the sidewalks: the width of the sidewalk changes according to the area of the area adjacent to it. Pedestrian streets in residential areas should be no less than two meters wide, enough for two wheelchairs to pass next to each other. As for sidewalks in commercial areas, the width of the sidewalk can be increased according to the pedestrian density. It is normal to use the area adjacent to it, as shown in Table No. (2). (10)

Table No. (2) shows the expected pedestrian density according to land use

land use	pedestrian density
Residential area	small
Residential area - hospitals	medium
Popular residential area - commercial or tourist area	High
Schools or universities	heavy

The appropriate width varies according to the density of pedestrians, as shown in Table (3).

Table (3) shows the minimum widths of the sidewalk, depending on the density of pedestrians

pedestrian density	Minimum berth width
Small (less than 30 people per minute)	3:00 m
Medium (31-80 people per minute)	4:00 m
High (80-120 people per minute)	5:00 m
Intense (more than 120 people per minute)	6:00 m

Second: Inclinations and slopes on the sidewalks: The maximum slope of the sidewalk surface in the transverse direction should be at a ratio of 1:50 to facilitate rainwater drainage and facilitate the movement of people with special needs. He must take into account the transverse slopes of the sidewalks at the entrances and exits of shops and home garages. The sudden change in the transverse slope of the sidewalks must be reduced as much as possible, and it should not be more than 1:20 in the longitudinal direction and not less than 1:12. As in Figure (12). (11)



Figure (2) The sudden change in the transverse slope (12, p. 6)

Third: The vertical space: It is the minimum vertical distance above the pedestrians along the path without obstacle, it should not be less than 2.4 m from the surface of the sidewalk and below the tree branches, and not less than 1.2 m for traffic signs and in areas with many commercial activities, the height of the awnings should not be less than 2.7 m, and the ceilings of residential buildings above the corridors are no less than 3.6 m. (12, p. 10)

Fourth: The height of the sidewalk: The edges of the sidewalks should be designed to prevent vehicles from entering the pedestrian area, while maintaining the ease of ascending and descending for pedestrians between the pedestrian area and the street, provided that it is 15 cm high.

Fifth: Pedestrian crossing areas: Pedestrian crossing areas are placed where there is a strong need to cross a street (at bus stops, market entrances, or at the intersection of the pedestrian corridor with the street) and in areas with high population density (they can be placed at regular distances (ranging between 50-100). meters), either signs should be placed at crossing points, or black and white lines should be placed across the street, with ramps in front of the vehicles. (13)

3.4 Design considerations for street furniture elements: Providing seats and seating places for pedestrians helps to achieve the principle of social cohesion. Seating places can be designed in a way that helps achieve privacy for individuals. Paying attention to the lighting elements is one of the most important aspects of reviving the path at night, as well as paying attention to the afforestation element, as it is one of the important environmental factors, and helps to confirm the visual character of the place and confirm the aesthetic image. Providing water bodies in pedestrian streets is very important, as it gives an aesthetic view, as well as helping to cool the high temperatures in summer. Guidance signs and attention to choosing their locations are important elements to visually distinguish pedestrian streets, and they can be placed in the main square, and they must conform to the general character of

the place. In terms of design and the choice of materials and colors, they must be placed in clear places for pedestrians, and some architectural treatments must be resorted to, such as shaded lanes, contracts and other means of street shading to protect against climatic factors such as sunlight in summer and rain in winter. (14)

3.5 Achieving the social dimension: Pedestrian streets are designed to meet the needs of all residents, and work to strengthen social relations through convergence. They are considered as places for recreation, recreation and comfort. They are an important part in cities where a lot of social interaction takes place, so pedestrian streets contribute to the sensory communication of individuals with The city as places of convergence and improvement of relations. (15)

4. ANALYTICAL STUDY OF SOME INTERNATIONAL EXPERIENCES OF PEDESTRIAN STREETS

A group of pedestrian street development projects in the city center will be presented to extract the variables that will be relied upon in the practical aspect.

4.1 San Juan Street development project in Barcelona, Spain

San Juan is an important historical street in Barcelona, Spain, which was established in 1929. The part extending between Tetouan Square and the Arc de Triomphe was renewed as a result of the appearance of damage to the street and sidewalk in 2010-2011 with the aim of developing the urban scene according to the needs of users. The original design and the historical identity of the place were preserved. The project consists of two pedestrian berths with a width of 17 m, between them is a road for automatic movement from two directions. The project also reached the finalists for the FAD Award for Architecture. (16)

The project was carried out in steps as follows:

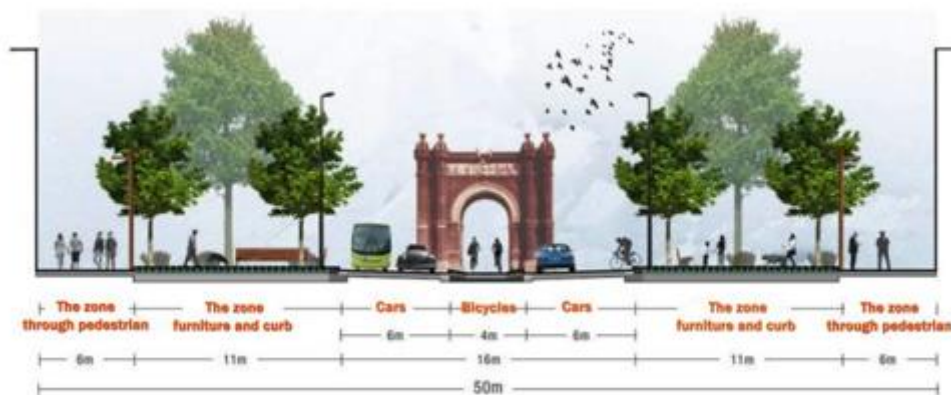


Figure (3) Cross section showing San Juan Street after development (16)

The project was developed in steps as follows:

1. Maintaining the width of the different lanes for pedestrian and motorized traffic, while maintaining the same crossing points for pedestrians from sidewalks to street along the sidewalk.
2. Allocating a space 6 m wide to serve pedestrians on the sidewalks to reach the entrances to housing, shops and restaurants on the sidewalk, with the addition of one 4 m wide lane and allocating it to the movement of bicycles.
3. Maintaining existing trees to provide shading on the sidewalks.
4. Planting bushes in a linear manner on the last edge of the sidewalk from the side of cars for a distance of 10 m and cutting it at distances consistent with the end of the pedestrian journey at certain points on the sidewalk.
5. The use of seats and plant elements as a double function for the purpose of sitting and separating the paths of cars and pedestrians.
6. Renew the street lighting and provide the necessary signals for each purpose during the pedestrian range, such as the movement of bicycles.

7. Providing waste bins and garbage recycling systems in appropriate numbers along the pedestrian path.
8. Using the latest construction and design details for all elements of sidewalks and streets, which suggests, To users that the street has been reconstructed, as well as to ensure the sustainability of the preservation of the historic street.16)) as in Figure (4).



Figure (4) Pictures of the gathering and seating areas located between the sidewalk and San Juan Street (16)

In the following table, the project is analyzed by criteria:

Table (4) shows the measurement of achieved and unrealized standards after the development of San Juan Street (researchers)

Main Elements	Sub items	check	don't check	
street components	the zone front		✓	
	the zone through pedestrian	✓		
	the zone furniture and curb	✓		
	the zone buffer	✓		
Principles and standards for the design of pedestrian streets	Achieving efficiency in design	✓		
	Achieving a visual image	✓		
	Achieving a safe pedestrian environment	sidewalk design	✓	
		Inclinations and slopes on the sidewalks	✓	
		vertical space	✓	
		sidewalk height	✓	
		pedestrian crossing areas	✓	
Design Considerations for Street Furniture Elements	Providing seats and seating areas	✓		

		Pay attention to lighting elements	✓	
		Attention to the element of afforestation	✓	
		Providing water bodies		✓
		Indicative signs	✓	
		Street shades	✓	
		Achieving a social dimension	✓	

The following chart shows the percentage of achieving standards for the San Juan Street Development Project:

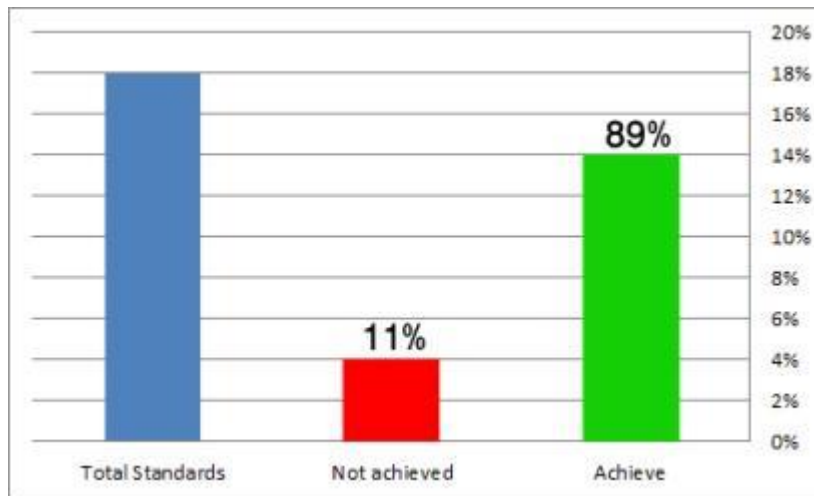


Chart (1) Measuring Realized and Unrealized Pedestrian Street Design Standards (Researchers)

4.2 The Allen and Pike Street Development Project, Manhattan, New York

The street is located in New York City, USA, in the Manhattan neighborhood. The two streets are commercial centers, there are some problems that cause traffic accidents, lack of security and difficulty in carrying out activities and difficulty in interaction between pedestrians. Therefore, the project was developed due to the narrowness of the sidewalk separating the buildings and the car street, and the pedestrian street was converted to the middle sidewalk separating the two streets as shown in Figure (6) and as shown below:

- Add relatively inexpensive materials and infrastructure such as signs and sidewalk markings to improve pedestrian and cyclist access and safety.
- Providing communication between the pedestrian path in the central island and both sides of the road by paving and designing intersections and pedestrian crossings, providing signs and guiding signs, and providing a general map of the area to facilitate access to the target without suffering.
- The development process contributed to facilitating the establishment of festivals, entertainment and cultural events, and also contributed to raising the value of rents in the area due to its aesthetic value and civilized appearance and supporting social interaction between residents and visitors.
- Providing a space for holding social, cultural and recreational activities, celebrations, and events. This encouraged users to establish activities and interactions between users.
- The street has become an aesthetic, civilized and organized appearance. The addition of plants and sculptural elements and the preservation of cleanliness and the general environment of the street contributed to this, as well as the presence of well-designed lighting poles with the choice of appropriate colors and the simple design of the street furniture elements in the path.
- The development affected the environmental condition of the street positively, as planting plants, providing garbage bins, and periodic maintenance of public utilities on the street contributed to this, as shown in Figure (5). (17)

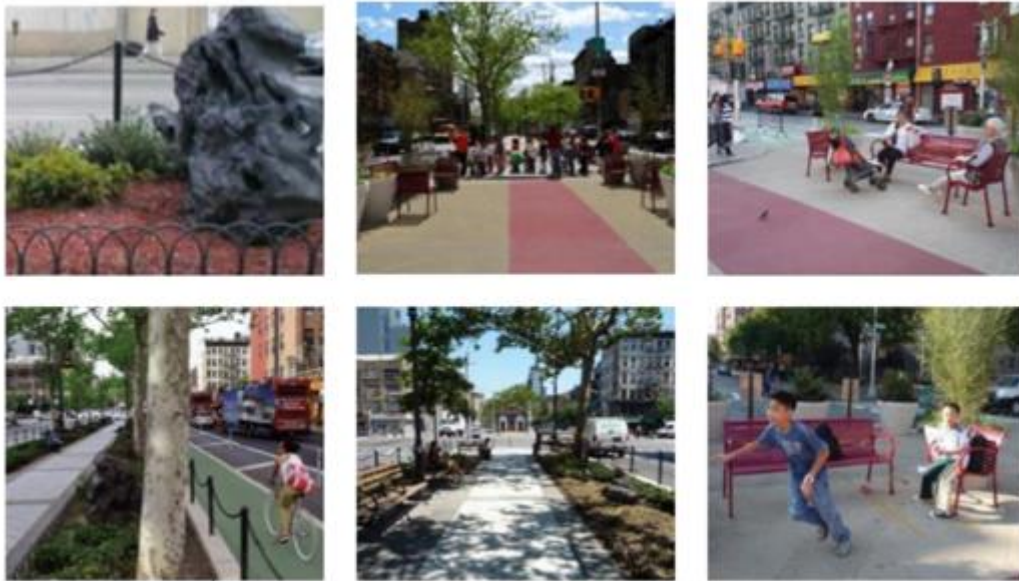


Figure (5) Illustrative image of the design elements of the pedestrian walkway on (Allen. 16) Street.

The achieved and unfulfilled criteria will be analyzed in the project through the following table

Table (5) shows the measurement of achieved and unrealized standards after the development of Allen Street (researchers)

Main Elements	Sub items	Check	don't check	
street components	the zone front		✓	
	the zone through pedestrian	✓		
	the zone furniture and curb	✓		
	the zone buffer		✓	
Principles and standards for the design of pedestrian streets	Achieving efficiency in design	✓		
	Achieving a visual image	✓		
	Achieving a safe pedestrian environment	sidewalk design		✓
		Inclinations and slopes on the sidewalks	✓	
		vertical space	✓	
		Pavement height	✓	
		pedestrian crossing areas	✓	
	Design Considerations for Street Furniture Elements	Providing seats and seating areas	✓	
		Pay attention to lighting elements	✓	
		Attention to the element of afforestation	✓	
		Providing water bodies		✓
		Indicative signs	✓	
Street shades		✓		
	Achieving a social dimension	✓		

The following chart shows the percentage of achieving standards for the Allen and Pike Street development project:



Chart (2) Measuring the achieved and unfulfilled standards in the design of Allen and Pike Streets (researchers)

The image shows the final result of the design of Allen Street, where the project area after development has become an attractive and safe public space as shown in Figure (6).

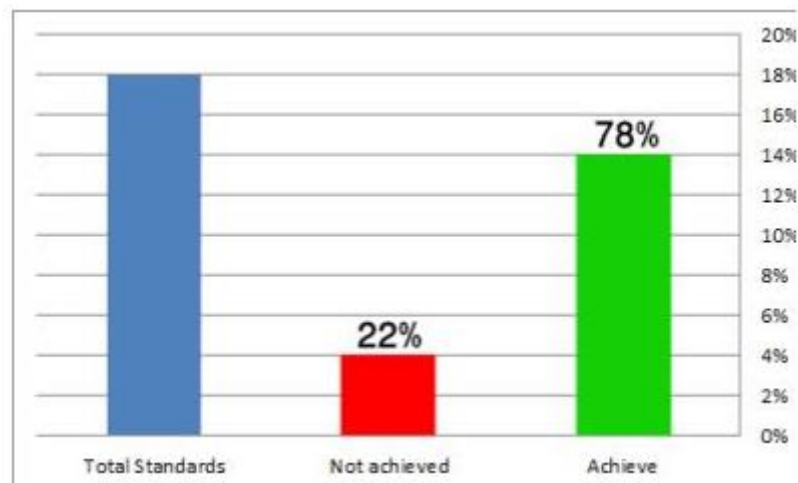


Figure (6) shows the final result of the development of Allen Street. (18, at the disposal of researchers)

5. APPLIED STUDY AL-SANATER STREET IN THE CITY OF KARBALA

The problems faced by pedestrian streets will be addressed and solutions that contribute to the development of the urban scene of the Iraqi city center will be addressed. Al-Sanater Street in the city of Karbala will be addressed as an example to address the problem of designing pedestrian streets in the Iraqi city, where Al-Sanater Street is located in the commercial city center and is characterized by the presence of restaurants and shops. Clothes, it is 800 meters from the ship's weir to the tax bridge, as shown in Figure (7).

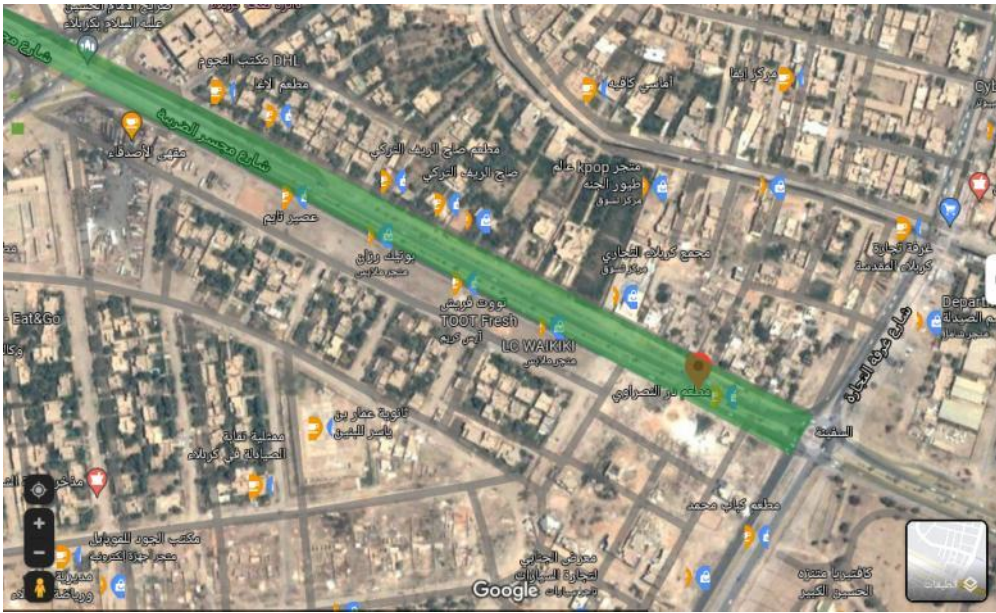


Figure (7) shows the location of Al-Sanater Street in Karbala. (19, at the disposal of researchers)

In this part of the research, the measurement is carried out through the criteria that were reached previously, which are the criteria and bases for the design of pedestrian streets, by making sure that each of these criteria exists in reality before or after the implementation of the development proposals. Which helps in achieving the difference between them and testing them, and thus it is possible to identify the weaknesses that we recommend focusing on so that the pedestrian streets reach in the manner that suits them, as it is an important social hub within the city. The reality will be measured before implementing the development proposals, as shown in the following table:

Table (6) shows the measurement of the achieved and unrealized standards before the development of Al-Sanater Street (researchers)

Main Elements	Sub items	Check	don't check	
street components	the zone front		✓	
	the zone through pedestrian	✓		
	the zone furniture and curb	✓		
	the zone buffer		✓	
Principles and standards for the design of pedestrian streets	Achieving efficiency in design		✓	
	Achieving a visual image		✓	
	Achieving a safe pedestrian environment	sidewalk design		✓
		Inclinations and slopes on the sidewalks		✓
		vertical space	✓	
		Pavement height		✓
		pedestrian crossing areas		✓
	Design Considerations for Street Furniture Elements	Providing seats and seating areas	✓	
		Pay attention to lighting elements	✓	
Attention to the element of afforestation			✓	
Providing water bodies			✓	

	Indicative signs	✓	
	Street shades		✓
	Achieving a social dimension		✓

As in the following pictures that show the elements and standards that are currently on the street and the unfulfilled elements as in Figure (8)



Figure (8) shows the analysis of the verifiable and unrealized elements in Al-Sanater Street in Karbala. (researchers)

The percentage of achieved standards, which amounted to 33%, appears as shown in Chart (3):

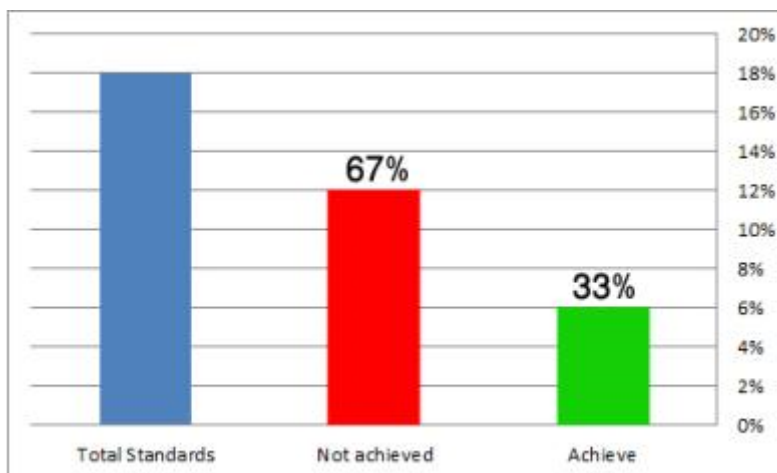


Chart (3) Measuring the achieved and unrealized standards before implementing the development proposals on Al-Sanater Street (researchers)

The reality of Al Sanater Street will be measured after the implementation of the development proposals, as the street will be treated to achieve the largest possible standards, as the furniture and seating areas have been determined, with appropriate misleading, afforestation, and modification of the sidewalk and slope dimensions, as shown in Figure (9).



Figure (9) shows the application of the proposed design elements and criteria for pedestrian streets in Al-Sanater Street in Karbala. (designed by researchers)

The criteria will be measured after implementing the development proposals, as shown in the following table:

Table (7) shows the measurement of the achieved and unrealized standards after the development of Al-Sanater Street (researchers)

Main Elements	Sub items	Check	don't check	
street components	the zone front	✓		
	the zone through pedestrian	✓		
	the zone furniture and curb	✓		
	the zone buffer		✓	
Principles and standards for the design of pedestrian streets	Achieving efficiency in design	✓		
	Achieving a visual image	✓		
	Achieving a safe pedestrian environment	sidewalk design	✓	
		Inclinations and slopes on the sidewalks	✓	
		vertical space	✓	
		Pavement height	✓	
pedestrian crossing areas		✓		

	Design Considerations for Street Furniture Elements	Providing seats and seating areas	✓	
		Pay attention to lighting elements	✓	
		Attention to the element of afforestation	✓	
		Providing water bodies		✓
		Indicative signs	✓	
		Street shades	✓	
	Achieving a social dimension		✓	

The percentage of standards achieved after implementing the development proposals appears, reaching 83%, as shown in Scheme (4)

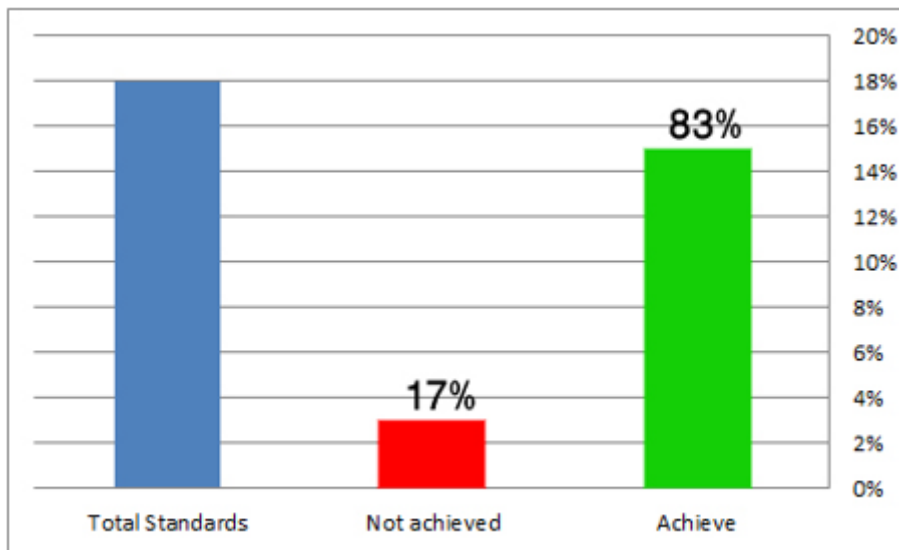


Chart (4) Measuring the achieved and unrealized standards after implementing the development proposals on AI-Sanater Street (researchers)

The implementation of the redevelopment proposals will be presented and compared to the situation before and after implementation, as the percentages reached:

- Percentage of criteria achieved before implementation of redevelopment (status before development) $(6/18) * 100\% = 33\%$
- Rating of the achieved standards after the implementation of the redevelopment (status after development) $(15/18) * 100\% = 83\%$

The percentage of achieving the design standards for AI Senator Street increased by 50% from the current reality, and as in Scheme (4):

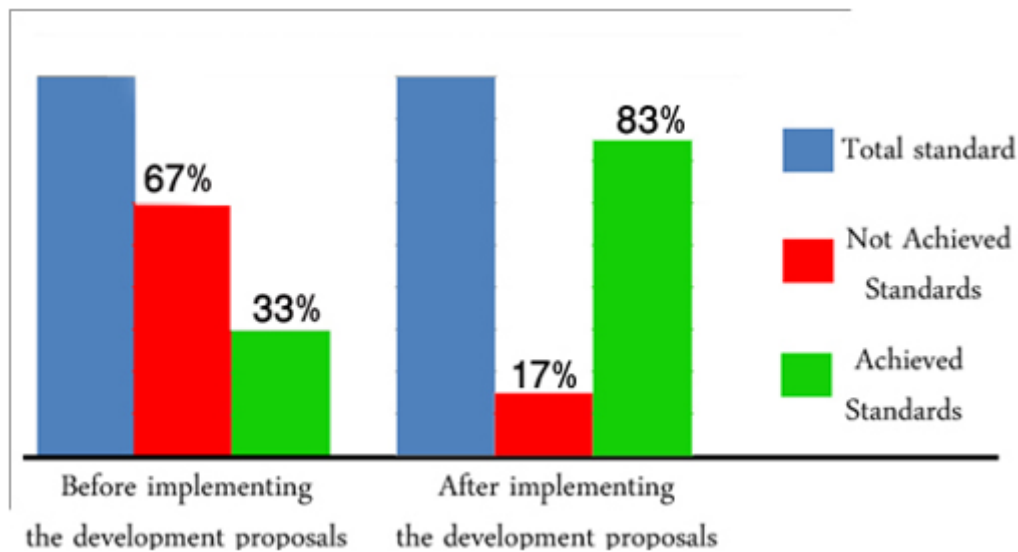


Chart (5) Comparison of the achieved and unrealized standards between the situation before and after implementation in Al-Sanater Street (researchers)

6. CONCLUSIONS AND RECOMMENDATIONS

- It is evident by conducting the measurement process that was based on the criteria deduced from the theoretical study, The development process focused on reformulating the components of the street to achieve efficiency and safety in the design and visual image, and attention to the elements of the furniture to achieve the social dimension. The result was a successful outcome to increase the percentage of the achieved standards.
- The physical criteria related to paths and roads and their gradation, lighting and basic furnishing elements were initially met in a small percentage before development, which means that the urban structure was eligible for redevelopment, but it lacked defining the goal and focusing on the visual, design and social aspects intensely.
- The basis of the interdependence and cohesion of the scene of the city as a whole is the amount of interdependence of the elements that make up it, and that the inconsistency of the urban scene within the Iraqi city center is due to the weak relations that link its elements.
- Pedestrian streets contribute to increasing the social activities of individuals through the sensory connection with the city. The exchange between the different city spaces and individuals is the basic material of urban life as places of rest and recreation, places of meeting and improving relations between individuals, in addition to their vital role in improving the city's images and life framework.
- The streets in the city of Karbala lack design principles, such as providing a green belt that separates pedestrian streets from car streets, and it is not counted within the width of the pedestrian street.
- After the proposed development, the pedestrian streets achieve harmony between the various activities and functions. Some uses, such as restaurants, entertainment and shops, enrich the street with life and movement.
- The research recommends the necessity of allocating a pedestrian movement within the city center to gain more identity and achieve an economic return for the residents of the region, as well as restore the residents' sense of belonging, to help develop and upgrade the region with the aim of trying to reach an urban scene with aesthetic and urban values for pedestrian streets.
- The necessity of creating an open space in the street by designing pedestrian streets to help confirm the distinctive visual identity and the combination of seating places and cafeterias in the middle of the pedestrian street provides a sense of the entertainment side and the social spirit of the path.
- The necessity of separating (pedestrian and vehicular traffic) on a horizontal level using regulatory crossings and signals for pedestrians, to reduce risks at intersections and control different traffic.

- Providing comfort and public health requirements such as services, sessions, shaded places in the path, and the introduction of afforestation elements And umbrellas and fountains, and furnishing on the street so that it is appropriate to the dimensions of the street and the space required for pedestrian movement.

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