The percentage of humanization in the main walkway of the old city of Najaf, using GIS technique

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Abstract. The realization of the concept of humanizing cities was linked to the study of pedestrian behaviors and needs. Since the street was the first element of the urban space that defined the Old City, were used as multi-use spaces to include places of shopping, meeting, work and picnic. However, with the rapid and changing development in human needs, the streets lost some of their functional and urban characteristics, and thus affected the extent of them being an urban space for pedestrians. In this regard, the research examines the principles of humanization of cities, include (connectivity, accessibility, mixed land use, comfort, protection, attraction, vitality, and human scale). The purpose of the research is to find out the old city center of Najaf can be considered a humane pedestrian-friendly city And calculate the ratio of its areas. The research identifies six main streets in the city center as a case study, namely Street (Al-Khournak, Al-Sadiq, Al-Tusi, Zain Al-Abidin, Al-Rasoul, and The big market). The study uses the (GIS) technique to determine the percentage of these features the street provides. Concludes that the pedestrian streets of the study area differ in the percentage that achieves the principles of humanism, as it needs improvement.

1- Introduction
Iraqi cities have traditionally relied on walking, cycling and public transportation for daily commuting, and many cities still have relatively low levels of cars despite the current rise in personal vehicle ownership [1]. The city center is the center of attraction for all residents, tourists and visitors [2], and it is the mirror that expresses the planning, design, harmony and beauty of the city. Therefore, it is necessary to have all the features related to the visual aspects [3].

Innovations in pedestrian planning have largely occurred in Responding to environmental changes. During the first half of the 19th century, walkways provided protection from motorized vehicles, and also a clean, dry ground to walking. While pedestrians were appreciated for their contributions to urban vitality, until recently, walking wasn't really deemed the dangerous part of a modern transit system. Walking is tidy, easy on infrastructure, healthy for individuals and an essential component of civic life. In view of these positive elements for walking, master plans are being formulated to attract more pedestrians to the streets. Emphasize plans to focus on contexts: security, mobility, communications, human health, streets, and land use [4].

From here, the research aims to measure the percentage of realization of the principles of humanization of cities for the main pedestrian streets in the old city center of Najaf. It represents the practical side of the research by using a field view of the study area to obtain data, evaluate it and enter it into the GIS, to come up with a map that determines the percentage of features achieved in each street. A conclusion was reached that the Big Market Walkway is 76% more humane and walkable due to its suitability for humans and a comfortable feeling of the place. The research recommends paying...
attention to the comfort and safety of pedestrians when making improvements that would make the street environment a comfortable environment and thus achieve greater attraction for people.

2- Humanize cities
It indicates the active role of urban citizens in building spaces in cities for the people. Which led scholars to interest in cities for the sake of people. And also placing the human in the center as an element to form the city to get rid of his current conditions and desires for a better life by facilitating the streets to serve him, easy access to services and providing him with amenities when using the street, as well as the buildings surrounding the path that achieve the human scale for a sense of inclusion and affinity. This understanding reflects the idea that the right to the city is a collective, not an individual, right [5].

A well-planned urban space achieves many values, such as social interaction, civic engagement, entertainment, safety, and a sense of belonging, which ultimately contribute to urban prosperity. It also provides benefits for environmental sustainability, transportation efficiency, and public health improvements, serving women, people with disabilities, older people, brings social values and economic advantages to the community. Thus realizes what is called livability for the city [6].

2-1- Humanization principles of cities
Below is a description of some of the planning features of Humanitarian Pedestrian-Friendly Cities [7]:

1. Accessibility: Walking services must've been accessible to every pedestrian, regardless of the capabilities.
2. Connectivity: Pedestrian amenities should be well connected allowing people to select the appropriate pathway.
3. Ambience: Pedestrian services must have a pleasant feeling that will make the areas appear attractive for people to use.
4. Place making: Pedestrian street fixtures can provide an environment in which people meet and socialize [8].
5. Safety: Pedestrians must feel that they and their belongings are safe. It refers to providing an environment in which pedestrians are not vulnerable to burglary or other crime. The physical design of streets and parks and buildings and the relationships within them play a role in increasing the number of "eyes on the street," which in turn can increase security [9].
6. Comfort: Pedestrians need an environment to provide for their physical and mental well-being by protecting them from the elements and adapting to their needs. This means that walking people rely heavily on features such as (short blocks, shade trees, seating seats, clear signs, buildings, lighting and signage designed on the human scale, source water, easy access) [10].
7. Attraction: An attractive place is a visually rich aesthetic environment with interconnected parts, providing a sense of contentment and social exchange. It is the treatment of building façades, tree spacing, lighting, quality of seats and garbage bins along the street [11].
8. A social environment: That the provision of an effective social environment on the street is one of the principles that achieve sustainability in it, so that the streets are suitable as an urban place that achieves societal goals. The street, as an urban space, is not just traffic and infrastructure corridors, but rather an environment that allows social interactions and the practice of outdoor activities and events such as meeting and walking [12].

3- Steps towards the City Walk
The Seven Steps to Walking City is built on models of best practice from around the world. It contains a set of proposed policies and programs targeting pedestrians. Each step will help in improve the walkable city and improve everyone's quality of life. Walking cities mean better cities for everyone. The following figure 1 shows the 7 steps towards the City Walk [13].
Figure 1 shows the Planning and design of the streets around the people makes them accessible and inviting them to have fun. To be healthy, accessible and attractive streets for everyone (the disabled and the elderly) so that everyone can enjoy walking and spend time there. Maintenance of high-quality, barrier-free footpaths. Avoid tension between pedestrians walking and biking by reallocating space on the road for riding rather than combining pedestrians and cyclists together and ensuring that bathrooms and seating are in positions that suit the needs of the pedestrians. Planning streets to suit work at all times, whether day and night in summer and winter, such as improving the lighting surrounding the street and developing various activities. Adapts to changing environmental conditions, such as the use of trees for shade and the sustainability of sanitation systems to reduce the possibility of flooding [13].

4- Study area

The scope specified by the research for the study (the old city center in Najaf), generally includes a group of main streets, and the research identifies six of them, which represent the research samples (Al-Rasoul Street length of 340 m / width 9 m, Al-Khouraq length of 227 m / width of 6 m, Al-Sadiq length of 315 m / width 9 m, Al-Tusi, length 265 m / width 18 m, Zain al-Abidin length 316 m / width 4-8 m, and the Great Market walkway length of 316 m / width 6 m) GIS technique was used to measure the length and width of the streets. As the walking distance for all streets is suitable for pedestrians and suitable for all ages and abilities. As for the width, Al-Khouraq Street and Al-Souq Al-Kabeer Street are within the standard set for humanizing cities, which is (6 meters), but Al-Tousi, Al-Rasoul and Al-Sadiq Street exceeds the standard and the width reaches (18 meters). Also, all streets are tiled using materials and colors that add comfort and joy to walking, but the large market walkway differs from other streets by being roofed, which protects pedestrians from different climatic conditions and uncomfortable sensory symptoms (pollution, noise, ...). Figure 2 shows the study area,
which is concentrated in a part of the old region, which is the most densely populated and the most diverse in terms of jobs. As shown by the following figures (4,5,6,7,8,9) streets of the study area.

**Figure 2.** showing the land use of the old city of Najaf Source: Researcher, depended on GIS 10.5 technique

**Table 1.** Land use in the walkways of the old city of Najaf

| Street name          | Al-Khourng Street | Al-Sadiq Street | Al-Tusi Street | Al-Rasoul Street | The big market | Zine El Abidine Street |
|----------------------|-------------------|-----------------|----------------|------------------|----------------|------------------------|
| Heritage / religious buildings | ✓                 | ✓               | ✓              | ✓                | ✓              | ✓                      |
| Residential use       |                   | ✓               |                |                  |                |                        |
| Mixed use             | ✓                 | ✓               | ✓              |                  |                |                        |
| Commercial use        | ✓                 | ✓               | ✓              | ✓                | ✓              | ✓                      |

Source: Researchers depending on field survey

Table 1 shows the distribution of land uses for the commercial pedestrian streets in the study area. The results of field monitoring of the streets of the city center indicated a great diversity of functions and uses, and Al Rasoul and Al Tusi Street were among the most diverse. The walkways contained a variety of goods, including clothes and foodstuffs, shops selling communications equipment, hotels and restaurants, in addition to the presence of religious and heritage buildings.
Table 2. Humanization rate in the main streets of the old city of Najaf

| Street name       | Al-Khourng Street | Al-Sadiq Street | Al-Tusi Street | Al-Rasoul Street | The big market | Zine El Abidine Street |
|-------------------|-------------------|-----------------|----------------|------------------|----------------|------------------------|
| Safety            | 6                 | 8               | 6              | 6                | 10             | 6                      |
| Comfort           | 4                 | 4               | 4              | 4                | 6              | 3                      |
| Mixed land use    | 10                | 10              | 10             | 10               | 6              | 6                      |
| Attraction        | 10                | 8               | 6              | 6                | 8              | 7                      |
| Human scale       | 8                 | 8               | 4              | 6                | 10             | 7                      |
| Street furniture  | 4                 | 4               | 4              | 4                | 6              | 3                      |
| Sustainability    | 3                 | 3               | 3              | 3                | 4              | 3                      |
| Connectivity      | 10                | 10              | 10             | 10               | 10             | 10                     |
| Accessibility     | 8                 | 6               | 8              | 8                | 8              | 8                      |
| Vitality          | 10                | 8               | 6              | 8                | 8              | 7                      |
| \[\sum\]         | 73%               | 69%             | 61%            | 65%              | 76%            | 60%                    |

Source: Researchers depending on field survey

Chart 1. Humanization percentage of the study area
Source: Researchers
Figure 3. Humanization rate in the main streets of the old city of Najaf
Source: Researchers depending on GIS 10.5 technique

Figure 3 and Table 2 show that the main streets of the old city of Najaf (the six) differ in terms of the percentage of humanization principles for pedestrian streets. Through the results shown in the table, the walkway (the big market) is among the best, 76% higher than other streets. As a result of providing protection, comfort and a humane standard for pedestrians, it also features a clear entrance and roofing along the walkway. As for Zain El Abidine Street, it achieved a lower rate, and it was 60% as a result of giving it a lower rating than the rest of the streets for the principle of comfort and street furniture. It is characterized by the limited availability of various activities in it, as the predominant use on the street is religious and historical buildings as shown in the figure 2.

Also, all the streets lack the organization of the shops and the stalls that display the goods, taking advantage of the street space designated for the movement of the pedestrian, and there are no seats to sit and relax for pedestrians along the path, which made the street lose one of the principles of humanity, which is comfort. Besides, some streets, including Al-Tusi Street, Al Rasoul Street and Zain Al-Abidin Street, are keeping pace with the development using materials for building façades that do not fit the character of the old city with the increase in the height of the buildings, which made them lose the human scale and affected the urban landscape of the streets.

5- Conclusions

1. The study concludes that the center of the old city of Najaf cannot be considered a city for pedestrians with the overall achievement of the principles of humanity in its streets.
2. Through the study, it became clear that there is a need to improve a set of principles for the purpose of achieving a pedestrian-friendly urban city, even if one of the principles alone fulfills the concept.
3. There are a set of principles that are comfort, street furniture, and sustainability (using environmentally friendly materials in street elements) that must be achieved together.

4. The study also concludes that there is a close correlation between land use and humanization principles.

5. The existence of functional diversity and the multiplicity of the uses of the earth leads to achieving a high attraction of plagues and space users and the existence of a social environment in which all components of society interact, which helps to provide a safe environment.

6. There is also a strong relationship between the physical elements of the street and the concept of walking; The provision and design of the physical elements have an important role in improving the possibility of walking on the street.

7. To achieve high comfort in a place, street furniture and access to services must be available.

8. The results showed that the large market walkway is considered more humane and walkable due to its suitability for humans as it is a roof that protects from different climatic conditions, which enhances the comfort of pedestrians.

6- Recommendations

1. Attention to the unity of homogeneity, whether in the architectural character, color or building materials of each of the pedestrian paths, to create a distinctive urban scene.

2. Continuous elevation of the walkway surface to facilitate and attract pedestrian traffic.

3. It is preferred that the design of the lampposts expresses the environment and the place.

4. Make improvements on the ground floor of the buildings in line with pedestrian traffic.

5. Planting trees on all streets wherever possible in order to beautify the city center and reduce pollution.

6. Take into account the comfort and safety of pedestrians when considering all general improvements in the city center.

7. Unifying the signs and redesigning them in proportion to the human scale, to improve the image of the place and reduce visual distortions.

8. Providing street furniture in suitable places that do not hinder pedestrian movements, such as sitting places, shaded corridors, and waste baskets.

9. Reconstruction and maintenance of alleys and traffic corridors connecting to and from the main streets to achieve higher permeability and make them suitable for movement.

10. The establishment and encouragement of some night activities such as shopping, meetings between people and cultural celebrations in the main streets to continue life at night.

Figure 4. The big Market walkway
Figure 5. Al-Rasoul Street

Figure 6. Zine El Abidine Street

Figure 7. Al-Sadiq Street

Figure 8. Al-Khourng Street
Figure 9. Al-Tusi Street

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