The axis of pedestrian movement between traditional and contemporary thought

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Abstract. Traditional residential revival in the city of Baghdad has been characterized by achieving environmental, social and economic integration and meeting the humanitarian requirements, taking into consideration the compatibility between the material and spiritual sides, focusing primarily on achieving the safety of the pedestrian movement which provides the best protection. As well as walking on foot is one of the oldest means of transport necessary and necessary and indispensable for access to various events and so on their positive impact on human health. At a time when most of the modern residential neighborhoods are deficient in achieving this trend, which generated a clear confusion in the movement of pedestrian because there is no homogeneity facilitates the transition process. Therefore, the research will examine ways to achieve this homogeneity by developing appropriate solutions and treatments to reduce this confusion and reach conclusions and recommendations.

First: The research problem
There is clear confusion in pedestrian movement in the city of Baghdad in moving from traditional areas to contemporary areas resulting from the random crossing of pedestrians and uncontrolled and neglecting this problem in most of the road network designs as most studies were concerned with vehicle movement and traffic congestion while it was largely neglected Pedestrian traffic handling.

Second: The objective of the research
Creating links that help to integrate pedestrian paths in the traditional and contemporary areas, thus achieving ease of access for them to perform daily trips and reduce accidents, random crossings and confusion between vehicle and pedestrian traffic.

Third: The research structure
The research is structured through the following:
1. Reliance on previous studies concerned with pedestrian movement.
2. Characteristics of pedestrian movement in traditional areas and their human, social and economic dimensions.
3. The planning errors in the design of pedestrian traffic corridors in contemporary cities.
4. Treatments in finding safe passages for pedestrian traffic in contemporary cities.
5. Down to conclusions and recommendations

Fourth: Research methodology
The research follows the descriptive method to find appropriate solutions to the problem of confusion in pedestrian movement between traditional and contemporary areas through special treatments such as tunnels or pedestrian bridges with the presence of attractions such as markets and recreational areas, which the research will conclude to come out with recommendations to solve the problem.

**Introduction**

The traditional residential revival in the city of Baghdad was characterized by achieving environmental, social and economic integration and meeting the humanitarian requirements, taking into account the compatibility between the physical and spiritual sides, and the focus in the first place on achieving adequate safety for pedestrian traffic that provides the best protection, as walking was the means of transportation to perform daily trips. In addition, walking is one of the oldest means of transport used and necessary and indispensable to reach the various activities and so on, and its positive repercussions on human health. At a time when most of the contemporary residential neighborhoods suffer from shortcomings in achieving this trend, which generated clear confusion in the pedestrian movement due to the lack of homogeneity that facilitates the transition process. Therefore, the research will deal with ways to achieve this homogeneity by developing appropriate solutions and treatments to reduce this confusion, leading to conclusions and recommendations.

**Previous research and studies**

There are many studies that dealt with the issue of pedestrian movement and how to organize their movement safely within the city, and these studies include:

1. An American study conducted in the city of Manhattan, where it studied the relationship between the different uses of the land, and mathematical equations were drawn that describe this relationship with the aim of analyzing the relationship and future prediction of pedestrian movement so that the results lead to being an important tool and assistance to the sinners and decision-makers in determining and providing pedestrian paths that are compatible with the future expansion of the city, as well as studying the environmental, social and urban factors that would provide comfort and safety for pedestrians while on the move and the extent of the need for a pedestrian crossing.

2. The Baghdad Comprehensive Transportation Study, 1981, where the British Scott Wilson Company studied the comprehensive transportation of Baghdad. The study included traffic volumes, public transportation, noise and air pollution, visual distortion ... etc, as well as a pedestrian situation study. However, this study established temporary solutions for pedestrian traffic and was confined to crossing areas and putting traffic signs. The characteristics of pedestrians, their environment, their movement paths, and the relationship of their movement to the different uses of the land were not studied.

3. Master thesis (the effect of designing pedestrian streets on the sustainability of urban areas, a case study (Khan Yunis City Center) for architectural engineer Wafa Naji Al-Astal / Islamic University / Gaza 2015

The study aims to focus on the importance of planning cities or residential neighborhoods that are compatible with the environment and are not centered in planning on private transportation, but on the principle of public transportation and the provision of integrated pedestrian paths, which plays an important role in reducing energy consumption and creating a sustainable urban design for the environment around it. And it reduces global warming, which threatens the planet with climate change.

**Urban characteristics of traditional cities**

The urban environment in our traditional cities was distinguished by its sustainability and anticipation of modern theories in achieving environmental, social and economic integration and its fulfillment of human requirements, taking into account the compatibility between the material and spiritual sides at a time when most contemporary cities suffer from shortcomings in achieving this trend, which led to the emergence of problems and the alienation of man from its environment One of the most important advantages achieved by the traditional urban fabric is harmony with its surrounding environment through:
1. The interconnected and organically superimposed blocks.
2. Reducing the intensity and brightness of the sun through refractions in the facade.
3. A group of internal open courtyards.
4. Achieving a kind of security and belonging to the place.
5. Pedestrian traffic safety and easy access axes.

The stages of the emergence and development of the plantation movement in the traditional city

The traffic systems and paths, “are represented by the main and secondary mobility roads and streets that people use for movement and mobility. The city usually owns a network of main roads to which other systems of secondary and secondary roads are linked within each sector or locality. Individuals perceive the components of their cities during their movement in these lanes that are linked between various elements of the city [Nasrallah, Rasha Malik, 2001, p. 21] and notes that movement paths play a fundamental role in structuring the traditional environment because they link public and private convergence. [Mecluskey] believes that the organization of the environment depends mainly on organizing the movement paths and places in it. High efficiency and degree of choice for transmission but weakens the sense of place, unlike the tissue The traditional spaces formed by its spaces have a high sense of place, so the paths of movement lead in them as places for social activities and social interaction due to the high sense of belonging to them [ Muecluskey, Jim, 1979, p.92-106] The systems of movement paths in the traditional city can be divided according to the stages of its development into:

First: The movement system in the first stage (the originality stage)

The system of movement paths in the traditional city is represented in its first stage, distinguished by its origin, as “an organically formed system, as the movement network of the traditional city is similar to the circulatory network of the human body. The main axes that connect between the different parts of the city and the religious center are linked by the secondary movement axes to feed the residential shops located on either side of these The axes down to the smallest cell represented by the housing unit, and in this system the streets do not follow a single pattern in terms of direction or breadth, but are generally dominated by narrow and twisted alleys. [Ali Hussam Hussein, 1981, p. 21]. The study of the function of the movement system in the traditional city shows its secondary importance. Within the urban fabric (with the exception of its main axes and arteries), as the primary is given to the space components of various types of private and public use, while the movement network acts as an auxiliary element to the resulting cellular structure. Therefore, the corresponding architectural elements absorb and accommodate the various parts of the complex network. Main streets are integrated within the framework of the market, and secondary roads integrate with residential sectors, while closed alleys integrate with the housing complexes that feed them, and through this gradient a high degree of privacy emerges for each part of the traffic network And this part is compatible with the privacy and personality of the space that serves [Bianca, Stefano, 1981, p42]. This hierarchy is gradual and sequential in a clear way in the system of movement paths in the traditional city, which is characterized by high fluidity. Down to the mosque or shrine space, where all the main paths flow into its space, so any route the visitor takes will lead to the mosque and the shrine. This system enables a person to move through the city, especially towards the main space of the shrine in a natural and enjoyable way [Al-Saadi, Abdel-Jawad, 1998]. The element of surprise participates in creating the urban picture of the system of movement paths in the traditional city through the gradation in the spaces of the movement paths to the stable space, whether The mosque space was the mother of the inner space in the residential unit, as well as the element of surprise resulting from changing the scale of the visual vision of the traveler with the presence of lighthouses and domes at the end of the street axis that works to not get bored and give an integrated perspective of the narrow alley axis and its changing vision.

The traffic lanes system in the traditional city is characterized by the predominance of pedestrian traffic in it and on an appropriate human scale, as the width of the street or the movement path is much less than the height of the buildings on both sides of which is no more than the two layers, and this greatly helps in imparting a human characteristic of the movement path as well as creating social ties between the residents of the neighborhood. On the one hand, this is one of the requirements for security in the
traditional neighborhoods of the city, on the one hand, and on the other hand, this human proportionality in the dimensions of the movement path plays a major role in addressing the climate situation in the city as it provides the largest amount of shadows for the passing person in it, the external projections of buildings on both sides of the street, or what is known as the chancel in the third dimension, increase in the upper floors, and this increases the width of the lower section of the street than the upper width of it, which helps the movement of air and its renewal from bottom to top [Ahmed, Nabil, 1988, P. 80].

The organic movement paths in the traditional city, in terms of public and private, consist of:

First: The general level: It is divided into:

The very public part: it is used by people from the "local residents of the city and its visitors coming to it from outside it, and it is the one that connects the main gates of the city with each other and with the city center as religious, administrative and commercial activities are concentrated and it is related to the roads that lead to cities outside the city of origin, and the number of its routes depends on the size of the city." And the level of services it provides to its neighborhoods from the surrounding areas, and its width ranges between (4-6) m, as it is used by pedestrians and animal-drawn vehicles [Bently, Lan & Alcocok, 1986, p34].

- The public part: it is used by the local residents of the city in their movement through the city, as this part of the network of paths is directly linked to the first part, leads to residential stores and links between them, and is used by pedestrians and vehicles, and its width ranges between (3-5) m.

Second: The Special Level: It is divided into -:

The private part: “It serves the areas within a single residential locality, so it is used by the residents of the locality themselves and branches out from the public part. Commercial services appear within the intersections of this part to serve the residents of the locality, and the width of its tracks ranges between (2-4) m.

- For a very special part: it is the Cul-De-Sac alley that serves a specific group of residences and can be linked directly with the paths of the aforementioned parts, and their length ranges between (9-140) m and at a rate of (40) m, while their width ranges between (1-3) M. [Hakim, B, 1986, p64]

Second: The system of movement paths in the second stage: (crossbreeding stage)

A new pattern appeared at this stage of the movement paths, which is the pattern of orthogonal streets or the so-called grid system in the expansions of traditional cities where the streets intersect at right angles between them, as well as the emergence of the linear pattern (Liner System). Or the so-called (penetrating pattern) due to its penetration into the traditional organic fabric of the city, and these patterns appeared influenced by Western concepts that entered the Arab countries and affected by the development of animal-drawn carriage technologies into fuel-powered cars. To a major and radical change in the concepts of street systems and traffic paths, as it changed with its effect the measurement of the movement network, instead of the human measurement being the adopted measurement in determining the dimensions of the movement path in terms of width and height and even in the details of the interfaces overlooking it, the measurement of the vehicle or vehicle became the most reliable in network planning. The streets with their dimensions that must accommodate the dimensions of the car and in addition to that contributed to the entry of the high-speed car compared to the speed of a person or an animal. It has what it has lost its organic and automatic characteristic of the previous regime, and it is noticed that this system of paths has moved away from adapting to the Arab environment in terms of climatic and social, if the wide width of its path makes it lose its ability to adapt to the climate and also helped weaken the social ties between residents of the residential neighborhood, and from here witnessed the second phase of Stages of the development of the traditional city. Three types of movement paths are the intertwined organic pattern which M. The original city, the penetrating pattern that penetrated it, and the orthogonal grid pattern that characterized the layout of the modern areas added to the original city.
City planning or neighborhood unit that is compatible with the environment should not be centered planning around private transportation, but on the principle of public transportation and pedestrian corridors and not moving towards extended urban planning to encourage the redevelopment of the existing site and the re-use of the constructed buildings and their rehabilitation to suit new uses in a manner that allows integration Public transportation systems with transportation systems in the residential community.

Urban design must be based on the principle of encouraging the use of public transportation instead of thousands of private transportation, as the increase in reliance on private transportation leads to the expansion of urban agglomerations at the expense of spaces and green spaces for the construction of roads and car parks, which leads to increased pollution and the depletion of non-renewable energy [Baker & Streemer , 2000, p4]

**Urban characteristics of the contemporary city:**
After entering the vehicles in a large number, the design of the city moved away from harmony with the human dimension, neighborhood unity, ease of access and a sense of safety, and the city became characterized by the following:
1. Separate, lumpy fabric
2. It is inconsistent with the climate
3. Surfaces are exposed to the sun for a long time
4. It is governed by urban laws and regulations.

As for the streets: it does not take into account the movement of the sun and the movement of the prevailing winds, just as we do not find the human relationship with the street an intimate feeling of control and estrangement from the emptiness and the control of the street over man and his movement due to the appearance of vehicles. Figure (1) shows the clear difference in the design of spaces between the traditional and contemporary city.

![Figure 1](image)

**Figure1.** The difference in the design of spaces in the traditional and contemporary city [Al-Ahbabı, 2010, p. 118]

**The system of pedestrian traffic routes in the modern city**
Due to the large increase in the number of cars and their frequent dependence on them, the compact urban structure and the paths of organic movement in the traditional city are no longer appropriate to the requirements of the modern movement of the mode of transport and the intensity of use, and this leads to the load of the organic system network beyond its capacity as well as the environmental, visual and noise pollution resulting from that. And the constant need for large spaces that act as car parks, so the solution came to force and severely to tear the solidified fabric into scattered pieces that lack coherence and integration by removing large areas of it to be replaced by broad straight streets and large squares.

The space for the intertwining organic tissue that characterized the old city and there became an inconsistent overlap between what was already existing and what was added, meaning that what happened was an attempt to mix the present with the past and merge them with the aim of modernizing the old and benefiting from modern technical progress and thus promoting the use of the penetrating
pattern from the paths of movement that appeared in the previous stage, to link the traditional part with the modern part added to the debtor space. The division of the route into large units not only destroys the human scale, but also prevents the route from preserving its various continuities, which are its essence (Schulz, Christian Norberg, 1996, p. 110). The images illustrate the clear mixing between pedestrian movement and vehicle movement in the vital commercial center in Baghdad.

![Image 1: Chaos of pedestrian and vehicle traffic in the vital commercial areas in Baghdad](source)

**Figure 2.** Chaos of pedestrian and vehicle traffic in the vital commercial areas in Baghdad Source: Pictures from websites on the city of Baghdad, the Shorjah Market area

*Contemporary trends in organizing the Pedestrian movement:*
Modern trends call for the development of land uses, which encourages the overlap between residential, commercial, administrative and entertainment spaces, which gives people the opportunity to live near their places of work and shopping, which gives an increased sense of "neighborhood unity and belonging to the community more than the usual suburbs as it creates activities for twenty-four hours." Through social homogeneity, such as job opportunities, the quality and level of schools, essential services such as shopping and commercial activities, entertainment activities, and how to access work to achieve self-sufficiency, which reduces the need to use transportation and thus reduces fuel consumption and environmental pollution [Kim & Rigdon, 1998, p27].

Therefore, urban design at the present time aims to respect human standards and preserve the environment when designing. Therefore, the design idea must be based on the movement of the pedestrian in the first place, then environmentally friendly means of transportation. Then comes public transport such as buses, electric and express trains and the metro. As for the private car, it is the last in the residential environment that seeks to achieve the following principles:

1. Exploitation of open spaces (streets, parks, intersections)
2. Complementarity between land use and transportation

Taking into consideration job opportunities, quality and level of services from schools, shopping malls, recreational activities, and how to reach work places [Al-Zubaidi - 2006, p. 142]

*Pedestrian Movement Approval:*
The urban design of residential communities aims to respect human standards and preserve the environment when designing, so it is necessary to rely on the design idea on pedestrian movement in the first place, then public transport modes such as buses, electric and express trains and the metro. As for private cars, they come last in the residential environment that seeks to achieve the principles next:

High population density and multiple use of space. [Al-Zubaidi -2006, pg. 142]
1- Exploitation of open spaces (streets - parks – intersections)
2. Integration between land use and transportation planning

*Important indicators for organizing Pedestrian passages*
There are several indicators that can be achieved for space organization at the level of urban sustainability through the urban matrix in order to correspond with the local, cultural and social needs to organize safe and comfortable corridors for the movement of the Pedestrian, as follows:

1. Realizing multiple urban spaces for human and social interactions and giving vitality to neighborhood unity.
2. Achieving connection and a sense of place through designing spaces.
3. Integration with activities and land uses, which enhances the social, economic and environmental return.
4. Integration in the methods of the negative
5. Focusing on public transport, taking into consideration private transportation.
6. The intermingling and integration of traditional values and principles and contemporary needs [William & Barton, 2000, p8].

Burton defined the principles of urban space design through:

1. Increasing self-sufficiency.
2. Meeting human needs and achieving social and environmental goals.
3. Space organization of the Sabila network and open spaces.
4. Planning (Future Street) as a public space that represents the social aspect of the neighborhood.

Burton also identifies the foundations of the urban space organization used by three main elements that affect the composition of any urban fabric:

1. Accessibility
2. Proximity
3. Functional mix [William & Barton, 2000, p7]

It is possible to achieve these indicators through some of the following treatments:

**First: Converting some streets to pedestrians**

And here we mean converting parts of streets into streets designated for pedestrians or pedestrian precedence. That is, the priority is for pedestrians and vehicles are allowed to enter, but with a restriction of their speed, a reduction in their service level, and priority for pedestrian movement over them when contradictory. This is allowed at certain times of the day or days. It is suitable for streets with very heavy pedestrian traffic and purchase movement, and that these streets are not major traffic streets for transit traffic, and that there are alternative routes and that there is a study of the traffic impact. The following should be done:

1. Facilities for the entry of ambulances, emergency, fire and security vehicles must be made.
2. To survey the opinions of home owners, stores and users to know their demands.

From this it is evident that the allocation of pedestrians gives a sense of respect for the human being more than the vehicle.

![Figure 3. Allocating lanes for pedestrian traffic parallel to the designated street for vehicle movement, and respect the human being. Source: Internet sites related to the topic of research in the experiences of countries for regulating footpaths](image-url)
Second: The role of pedestrian bridges in providing a corridor for pedestrian movement:

Pedestrian bridges are one of the components of the traffic system in the city and the need for them increases to provide isolation between pedestrian traffic from the movement of vehicles, which has developed with the increase in the use of vehicles and to ensure the smooth flow of vehicle traffic in public streets and reduce the special places for pedestrian crossing on the street surface (crossing lines), whether controlled. Or uncontrolled, which makes it easier for vehicles to reach their targets quickly without risk, reduce accidents to city residents, and reduce the conflict between pedestrian traffic and vehicle traffic. [Intisar Abdul-Hussein Habib Al-Hashemi, Issue 101, p. 400]

One of the examples of the use of pedestrian bridges in the Arab countries is what pedestrian bridges witnessed in Abu Dhabi to provide a safe and ideal transportation crossing for roads for different audiences, with their presence in many major streets and highways that witness heavy traffic, and these bridges also provided a “five-star” transportation service “For the elderly and people with disabilities, as their use is no longer a great problem for them, with the availability of elevators in many of them, to reduce the delay for pedestrians in their use, which turns into a goal they wish to be in the various streets of Abu Dhabi.

Third: Pedestrian (facilities) equipment, which includes:

1. Sidewalks:

The dimensions of the pedestrian sidewalks depend on the size and movement of the pedestrians to be served as well as on the importance of the road, and by studying the pedestrian movement the engineering elements can be determined and if the width of the street is not allowed to accommodate the movement of vehicles and pedestrians as is the case in most of the city center streets, work can be done to separate the two movements vertically and the width of the sidewalks ranges. The pedestrian in residential areas ranges from 4 to 6 meters, while in commercial areas the width varies between 3 and 4 meters.

The width of the berth depends on:

- Number of pedestrian lines
- The type of the road (is it for a picnic or for trade or anything else).
- Afforestation.
- How to park cars near the sidewalks (parallel to the sidewalk or vertically or diagonally on the sidewalk as it happens in some squares) and the minimum width of the sidewalk is 50 and 1 meters for pedestrians in the case of a sidewalk without trees, and a width of not less than 3 meters in the case of a sidewalk with trees, usually 75 and 4 meters.

2. Pavement widths in different road sectors:

- Sidewalk widths in the different road sectors are affected by:
  - The volume and density of pedestrian traffic such as commercial areas and amusement parks.
• Intensity of uses on the sidewalks (agriculture - lighting - signs - advertisements - transformers - kiosks) and other uses.
• The quality of the road, the role of pedestrians on it, and the relationship with a land use.

Conclusions and recommendations
-Efficient space design is one that takes into consideration human design strategies as a practical tool to raise the efficiency of space organization for neighborhood unit by employing it as a mechanism for transferring inferred indicators and criteria (such as distance of arrival - mixed uses - adopting cable movement and public transport) as factors to achieve an appropriate and safe environment.
-It is necessary to provide special places for pedestrian movement only, especially in places of entertainment and shopping without entering private vehicles with the provision of all amenities for pedestrians, which include
1. Taking into account the walking distances, which are within (500 meters), taking into account the factors prevailing in the local environment.
2. Aesthetic aspects of the floors and the elements surrounding the path.
3. Guidance on the pedestrian traffic network must be an essential element in determining the path by placing distinctive signs for each sector on the path.
4. Proportion between the pedestrian size and the width of the path.
5. Providing adequate lighting and keeping away from any curves or tendencies, if there is roughness in the sidewalk surface.
6. Achieving fluidity in pedestrian movement by balancing the speed, size and width of the path.
7. Provide sidewalks with suitable widths relative to the level of the road on which it is based.
8. The afforestation and furnishing elements on the path must be appropriate to the dimensions of the path and the space.

- The study of the Sabila movement is very important to determine the shape and cycle of movement in it, and it must be taken into account the tremendous movement resulting from public transport stations and intersections in the city center streets at different hours of the day and the daily, weekly and monthly change of it.
- Activating pedestrian tunnels and rehabilitating them to attract pedestrians, using elevators or electric stairs in crowded places and hospitals, and paying attention to their modern and advanced designs to facilitate pedestrian movement in these places and to provide safety and comfort in movement.
- Attention to the media aspect of the necessity to adhere to traffic rules and the importance of using pedestrian bridges, tunnels and public transport means to provide comfort and reduce traffic accidents.
- Redesigning the streets in a way that provides easy pedestrian and bicycle movement, with attention to isolating the movement of vehicles and providing appropriate disinformation during the performance of trips, such as business or shopping trips or other things that attract pedestrians to leave the movement in cars and adopt walking or public transport.

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