

# The 20 Minutes Neighborhood between Planning and Reality: Analytical Study of Al-Jumhuriya District (District 838 and Part of District 840)

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**Abstract** Urban areas have undergone many transformations such as urban population composition, the nature of the built environment (specially housing and transportation network), and urban land use, due to many factors, such as population growth, economic aspects, and the impact of the COVID-19 pandemic. They changed people's perceptions about land uses, urban space and cities. This led to many urban problems. Based on the foregoing, the research led to vital discussions in urban planning through proximity, public places and accessibility to the basic urban function. Each person in the community deserves livable neighborhood, accessible for this daily base trip easily. Goals: Studying and evaluating a residential area within Baghdad by adopting the concept of a 20-minute neighborhood. The planning indicators for 20-minute neighborhoods (density, diversity, proximity) were tested based on a map of the status of the study area and a field survey and given the research objective of the importance of residents in assessing their neighborhoods, asking a sample of the community about the patterns of daily urban activity and how they use the neighborhood to show the extent, to which planning indicators (proximity, diversity, density) match the use of residents within the concept of a 20-minute neighborhood. Results: The results showed that the concept of a 20-minute neighborhood was achieved in the residential area when measuring the planning indicators (density, proximity, diversity). However, it did not reach the concept according to the opinion of the residents, as most of the daily activities were

using cars and heading for services outside the neighborhood. When the sample was identified, the results showed that the gaps lie in the failure of services (transportation, education, social infrastructure, health, work) to meet the needs and requirements of the residents within the concept of a neighborhood for 20 minutes. Conclusions: The success of 20-minute neighborhood planning is not required by planning indicators and criteria. Its success depends on the actual use of neighborhood residents, and they are the only ones who recognize the success of the neighborhood or not.

**Keywords** 20 Minutes Neighborhood, Proximity, Diversity, Density, Actual Use of Resident

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## 1. Introduction

The ongoing pandemic crisis has represented an opportunity to rethink strategies and actions to meet its challenges. The COVID-19 pandemic has had an immediate, profound, and potentially lasting impact on how we use cities to live and work. The COVID-19 emergency, with restrictions and gradual closures, has forced city dwellers to change the use of urban spaces and roads to access services [1]. In response to this unprecedented shock to the urban, social, economic, and health systems, there have been contributions to the

growing call for the importance of what planning can provide toward sustainable recovery, which included accelerated progress toward a green economy and the creation of justice, healthy and prosperous societies [2].

The possibility of more epidemics contributes to the trend towards (urban transformation, proximity, accessibility to services, and promoting easy mobility) options, especially at the neighborhood scale. The planning concept and urban growth model known as the 20-minute neighborhood has thus gained significant attraction around the world as a means to support this recovery and a new possibility to reorganize the urban system (times, spaces, and activities) to try to respond to many of the current challenges, including an aging population, energy savings, and most recently, COVID-19.

The main essence of this research appears from the recognition that some urban planning and design models of our cities contributed to the dependence on cars, low physical activity, and carbon emissions. It can lead to better health outcomes for the individual and the environment. The research problem appears: the absence of a clear perception of the gaps and the reasons that led to the lack of promotion of an active lifestyle that facilitates the lifestyle and can lead to better health outcomes for both the individual and the environment and can cope with crises, and the most important of those gaps diagnosed by the research is the reliance on indicators. Planning is only performed in the analysis and testing of planning models, including the 20 minutes neighborhood model. To solve the research problem, the research assumes a hypothesis: The testing and realization of the concepts of the 20 minutes neighborhood model are achieved through the integration between the planning indicators and indicators of the actual use of residents and their need for services.

The research aims at the importance of rethinking and evaluating the development of the smallest unit in the city, represented by residential neighborhoods, within strategies that focus on the importance of the resident through analyzing the patterns of his urban activity within the neighborhood to achieve vibrant residential shops within the concept of a 20-minute locality and to monitor the gaps and access to solutions that in turn facilitate human life under stressful economic and environmental conditions.

## 2. Methodology

To achieve the research goal, the study methodology consisted of two sides, the theoretical framework and the practical framework.

## 3. Theoretical Framework

The theoretical framework of the research relied on the qualitative approach in collecting multiple sources and data

from the literature related to the concept of a 20-minute neighborhood in order to understand and analyze the urban concept by classifying these sources and data on a set of branches that included the branch on the roots of the emergence of 20-minute neighborhoods from the early twentieth century to the 21st century to reach the 2030 Agenda, followed by the branch of the characteristics of the 20-minute neighborhoods, which included the most critical planning indicators to ensure the achievement of a neighborhood that applies the concept of 20 minutes, represented by indicators (proximity, diversity, density) based on the idea of the research integrating the planning indicators and indicators of the residents' use of the neighborhood, a set of experiments and studies were studied, through which a set of indicators and mechanisms related to the residents' need to use the daily base services were extracted: (transport, housing, health, education, green infrastructure, social infrastructure, labor).

## 4. The Practical Framework

The practical framework relied on analytical quantitative approach for the case study, represented in the chosen neighborhood within the city of Baghdad in the Dora area, to see the extent to which the 20 minutes neighborhood indicators were achieved. Methods of analyzing and data collecting about the study area included:

Using aerial photographs and satellite images with examinations and field surveys to analyze and show the results of the extent, to which the planning indicators have been achieved (proximity, diversity, density).

Preparing a special questionnaire for a sample of the study area that includes questions about the patterns of daily bases urban activity and how the neighborhood is used to show the extent to which the planning indicators (proximity, diversity, density) match with the use of residents within the concept of a 20-minute neighborhood.

Based on the analysis of the sample questionnaire explained above, the research hypothesis will be reached regarding conformity, integration, or lack thereof between the planning indicators and the extent of the resident's use of the neighborhood. In case of non-conformity and proof of the research hypothesis, another questionnaire will be prepared for the same sample that includes questions about the mechanisms related to the residents' need to use daily services to reach a clear perception of the gaps and the reasons that led the residents not to consider their residential 20 minutes neighborhood despite the achievement of planning indicators (proximity, density, diversity). The results of the answers will be calculated using the Likert scale and the results will be analyzed and presented in the form of tables and graphs to discuss these results and reach the final conclusions.

## 5. Theoretical Framework

### 5.1. The Roots of 20 Minutes Neighborhood

Before the early 20th century, walking was the most common transportation. Historic urban centers that emerged before the spread of motorized vehicles were designed to be compact and connected to meet the needs of their communities. Planners have attempted to create models to achieve close and walkable cities through the theory of 'garden cities' by Ebenezer Howard in the 1890s and the 'central place' approach by Christaller and Losch in the 1930s [3] with the original garden cities of Letchworth and Welwyn among the first attempts. The first is for sustainable development and its design to provide a range of local jobs, different housing types, and walkable neighborhoods [4].

In contrast, many mid-20th-century developments were loosely inspired by Howard's vision. Many were less compact and complete. Most towns and neighborhoods developed in the mid-20th century were designed to prioritize cars [5]. By the late twentieth century, many towns and cities had been restructured with ring roads and double lanes. They planned to widen roads to prioritize people who drive rather than those who walk, assuming that people would commute by car or bus, and their walking needs were not prioritized.

In the 21st century, many policies and guidelines for planning and transportation have increasingly favored prioritizing walking. Several design tools have been adopted to create neighborhoods that focus on active mobility design, which is known as a critical guiding document that aims to plan by promoting appropriate conditions and environments for individuals and communities to be active and healthy [6]. Reviving 20-minute neighborhood brings benefits on several levels represented by health benefits, including physical and mental health. The time you spend walking in green spaces directly contributes to mental health and recovery. In addition to the social benefits, living in a walkable environment can support a sense of community and improve social interaction [7]. Furthermore, it achieves a safety concept where pedestrian activity increases in public places with more "eyes on the street." It leads to improved perceptions of safety through monitoring [8].

Walkable environments with highly interconnected street networks are likely to positively contribute to labor productivity and maintain the value of those environments because they are popular places to live and do business, as well as the potential to bring an investment and jobs with economic benefits [9]. 20-minute neighborhoods encourage planning for walkable environments by shifting from private car travel. This contributes to reducing air pollution, providing opportunities to improve biodiversity, and thus having significant environmental benefits [10].

Based on the preceding, the importance and benefits of

20 minutes neighborhoods are economic, environmental, and social. This is associated with the dimensions and pillars of sustainability. Current trends have shown that planning for 20-minute neighborhoods is consistent with the Green Deal principles, which are based on the need to make cities increasingly green, safe, and inclusive. This reflects the developments of the sustainable goals 2030 agenda, in particular the excellent health and well-being represented by (Goal 3) and resilient, sustainable, and inclusive cities (SDG 11), where proximity is vibrant and social density is real [11].

### 5.2. Concept and Characteristics of a 20-minute Neighborhood

Planners, city leaders, neighborhood groups, and local partnerships are discovering the benefits of creating places that include most of the things people need for their daily lives during a short, fun walk or a bike ride. These complete, compact, and connected places are given different names by different communities in Paris, defined as 'the city that takes 15 minutes [12]. For Melbourne, it is called a "20-minute neighborhood," and it is also called a "livable neighborhood" in Perth, Australia [13]. It can be said that it does not matter the description or the number of minutes, but rather the idea at its core and the benefits that the method of creating these places brings as a holistic and transformative approach to place-making with great potential to improve people's health and well-being.

The 20-minute neighborhood concept revolves around "living locally," allowing people to meet most of their daily needs within a 20-minute walk from home, with access to safe cycling and local transportation options. It adopts the principle of the 20-minute neighborhood for human scale livable spaces, primarily for people, encouraging walking rather than using cars [12].

The primary objective of these neighborhoods is to regenerate urban centers, enhance social cohesion, improve health outcomes and support the movement toward the Sustainable Development Goals. Detroit Mayor Mike Duggan's vision was to realize the basic concept of the 20-minute neighborhood: "Anyone who lives in one of these neighborhoods should be able to cycle or walk to (non-work) tasks in just 20 minutes." Mayor Duggan has set goals for the planning and development walkable neighborhoods that seek to ensure residents have a 20-minute walking radius across productive, safe, and beautiful land. He cited the most important measures of feasibility [14] including 20 minutes to transit (including bus stations, BRT, light rail, carpool, etc.) and 20 minutes to the park (including green roads, waterfronts, plazas, public recreational facilities, natural areas, etc.) and 20 minutes from Blight. (One should not encounter dilapidated buildings, deserted streetscapes, or dilapidated infrastructure within a 20-minute walk.)

Referring to studies, plans, and initiatives to develop and create residential neighborhoods according to the concept

of 20 minutes, including the Detroit plan, the research extracts the main planning indicators of the 20-minute neighborhood, which are as follows:

### 5.2.1. The Proximity Dimension

The proximity that Carlos Moreno envisioned in the city of 15 minutes and neighborhoods of 20 minutes entails both temporal and spatial aspects. The ultimate goal focuses on ensuring that urban residents can quickly access urban services and amenities without spending money on travel and without having to spend undue time in traffic.

The proximity also allows residents to not only access services and facilities but has a significant impact on how they can take care of themselves in areas such as health, acquire new skills and knowledge through education and have extra time to enjoy their free time [14]. It is therefore estimated that to support 20 minutes neighborhood, proximity to basic daily needs (access to social and recreational facilities, health services, schools, and local shopping malls) may require 20 minutes and an 800m walking distance from the home to the destination.

### 5.2.2. The Density Dimension

Density is a vital aspect, especially in achieving proximity index mentioned above. Density determines the number of people which a given neighborhood can comfortably accommodate without stress or underutilizing available resources, infrastructure, and available space [2].

The density index, followed in the 15-minute city concept, focuses on the optimum number of people that would allow sustainability, establish healthy social relationships, reduce car use, and allow optimal resource consumption. Density not only requires a specific number of people but is also reflected in the availability of basic facilities and services. Residents of a particular locality will not need to move around to look for services elsewhere. Density determines the number of people a neighborhood can comfortably accommodate. It is estimated that to support 20-minute neighborhoods, an average density of at least 65 dwellings per hectare may be required, although it may be higher in some areas [15].

### 5.2.3. The Diversity dimensions

In the context of the 15-minute city concept, Moreno depicted diversity in terms of the physical environment and the people who occupy the city. In terms of the physical environment, his conviction is for a town that would fully embrace the mixed-use aspect. Where basic amenities and services are accessible, the neighborhood must include at least the residential, commercial, governmental, health, educational, and recreational components [16]. The second aspect of diversity that will make those social functions more prosperous is neighborhoods that accommodate and encourage diverse cultures from different backgrounds.

About the above, it becomes clear the importance of urban planning and the role of planners and decision-makers in achieving the planning indicators

(proximity, density, and diversity) to establish healthy, sustainable neighborhoods according to the concept of a 20-minute neighborhood. Despite the importance of the three indicators related to planning, the research raises a question: Does the inclusion of the three planning indicators in the planning of neighborhoods achieve a 20-minute neighborhood? Thus, the research assumes that the three planning indicators are not sufficient and that the planning of a 20-minute neighborhood is achieved through the overlap between the planning indicators that were touched upon in the above paragraphs and the indicators related to the behavior and activity of the residents and their use of the services of those neighborhoods, which will be addressed in the next paragraph, which was extracted from studies and experiences [on the extent to which residents use essential services (transport, housing, education, green infrastructure, social infrastructure, health, work), as each of these services has mechanisms when achieved, the actual use of them by the residents is achieved.

## 5.3. Indicators of the 20-minutes Neighborhood

### 5.3.1. Transportation

Transportation is an important policy tool in 20-minute neighborhoods. Providing safe and accessible streets and spaces is essential to the 20-minute neighborhood. This gives people the maximum choice in how they ride their trips in terms of walking, cycling, or public transportation. The quality of street network design is critical to producing attractive environments while reducing air and noise pollution and providing opportunities to communicate with nature. Thus, the importance of street design was emphasized to create conditions that meet the needs of all members of society, women, the elderly, children, and people with disabilities, by including many elements, including a sense of safety through street lighting and the absence of empty and neglected spaces, a sense of comfort through providing shade and means of guidance [17]. Studies have shown that people are more likely to walk if there are walking routes directly to their destination and in places with a network of several interconnected walking ways at different times of the day and throughout the year [18].

### 5.3.2. Housing

The housing service in the 20-minute neighborhood is represented by abundant housing options available at different prices [17]. It comprises duplexes, triplexes, and small apartment buildings that ultimately support the creation of a socially and economically diverse resident population. Building more housing, in general, will help address the housing shortage at the city level and stabilize housing prices. Diversity in housing achieves vibrant neighborhoods and depends on a diversified housing stock to meet the different lifestyle needs of residents [18]. The

diversity in housing through:

A combination of rented and occupied units.

A combination of different building types (horizontal, vertical housing, etc.) and buildings with other uses, such as retail - makes the neighborhood more dynamic.

A combination of different unit sizes allows children, childless and youth, to live side by side.

A combination of market price and income-restricted units. Affordable, income-restricted housing can be created through various programs that support housing development and housing projects.

Referring to housing diversity and flexibility, housing in a 20-minute neighborhood should provide homes that allow old age, homes that will enable work from home, housing of high quality that contributes to belonging to the area, and homes that are energy efficient and provide pleasant and comfortable environments [18].

### 5.3.3. Education

School location, design, and management are essential to the 20-minute neighborhood. Studies have indicated that many environmental factors influence schools' active mobility. Several authors, including Moudon and Lee, have suggested three significant factors: the nature of the neighborhood, the route between home and school, and the school environment that provides walking and cycling facilities around the school and in the schoolyards [19].

The concept of education in the 20-minute neighborhood focuses on the importance of schools being school community centers characterized by the sum of the relationships that link the school, the family, and the community. It focuses on the academic development of children and youth, civic engagement and contribution, family support, and social services, emphasizing safety, health, and community services through education and the school's curriculum, as well as the possibility of benefiting from schools as community centers by opening their buildings and playgrounds when not in use [20]. A 20-minute neighborhood can provide learning opportunities outside of school through efficiently accessible facilities and places for community education. Community education is essential because most environmental and social problems arise from people's actions [21]. Community education provides a structured and effective way to respond to the challenge of improving public education because it expands the traditional role of the school and creates a reciprocal relationship between home, school, and community. This allows formal and informal learning opportunities available to residents of all ages in various neighborhoods. Community education consists of three essential components: lifelong learning opportunities, community participation in schools, and effective use of resources [20].

The 20-minute neighborhoods aims to implement the concept of "school streets" [22], whereby streets connected to schools are car-free, and roads are closed to vehicles (or

access is severely restricted) - usually only for a short period at the start of the school day and its end. Some are permanently free of cars. School streets put children first, providing a space to talk, run, play, and stop on their way to school. Car-free space reduces noise, stress, pollution, and risk of injury, as well as encouraging physical activity, social bonding, and other benefits to people's well-being that the 20-minute Neighborhood aims for [23].

### 5.3.4. Green Infrastructure

Green infrastructure is a critical component of 20-minute neighborhoods, integral to sustainable cities and neighborhoods. Many cities worldwide are planning to increase green infrastructure systems to address the goals of climate resilience, urban livability, and human health and well-being [24]. Green infrastructure may include living elements of outdoor spaces such as trees, rain gardens to control rainwater flows, food-producing gardens, as well as walls and roof garden to reduce urban heat [25]. It may include non-living elements supporting living elements, such as rain tanks and permeable pavement [26]. Green infrastructure also consists of the private residential outdoor spaces surrounding a person's home on their property, including back and front yards, porches, driveways, decks, and patios which can all play an essential role in achieving livable urban neighborhoods [27]. While green infrastructure is being planned, this requires regular care and maintenance, and various ways of financing may be financed by municipal councils or innovations [27].

### 5.3.5. Social Infrastructure

The social infrastructure in the 20-minute neighborhood includes places where social bonds develop as people gather to ensure stronger community relations between their residents and with purpose-built indoor and outdoor community spaces. It is flexible, as it can happen in gathering and playing areas and commercial spaces. These places may be publicly owned, such as public schools, parks, libraries, and others owned by the private sector and NGO that play a prominent role in significant creating spaces and providing essential services that individuals need to develop links and participate in community and civic life [23]. Research has suggested that temporary 'play streets' - short-term, sometimes periodic road closures - can provide a social entertainment facility as they create a safe space (street) where children can play together and be active outside. As it is widely recognized that providing time and space to play is essential to every child's health, happiness, and growing, neighborhoods often lack safe and accessible play spaces, and play streets can be an innovative way to create play opportunities [28].

Finally, open and public space is an essential component of social infrastructure by creating space for human interactions that are not dependent on commerce. Public

parks and green spaces can be the site of public events, summer programs, or small family gatherings by providing essential services such as drinking water and public toilets. The successful place of the 20-minute neighborhood is the place that meets the needs of all age groups and stages of life while recognizing that different age groups have different needs. These are translated into urban spaces with indoor and outdoor spaces to accommodate community events, and these spaces can be used at an additional time of the day and throughout the year and in different types of weather.

#### 5.3.6. Health

Health is affected by the quality of places. There is a close link between neighborhood planning and design and public health. 20-minute neighborhood planning focuses on community well-being and health facilities. These facilities were used to their total capacity to support a healthy lifestyle for all its residents, regardless of age, sex, and gender. All the indicators of the 20-minute neighborhood support the essential elements of healthy neighborhood design that are integrative: diversity and mixed land use and compact in terms of concentration of services and not spread over large areas, as well as connectivity that makes access to destinations convenient and enjoyable.

Evidence shows that people are healthier when they live in communities designed to support everyday healthy choices. Planning and design can affect community health in several ways, including physical activity, food, nutrition, air quality, traffic safety, accessibility to health care services, parks, and open spaces that create positive social interactions. Availability and access to primary health care are one of the features of the 20-minute neighborhood that has the potential to impact health directly. Increasingly, most health care can be provided through community health centers and multi-purpose venues that can include a mix of health practitioners and other forms of community support, such as charities offering companionship and sport exercise classes, clubs, and other forms of health social services facilities [3].

The provision of facilities and walking and cycling paths encourages residents to spend time outdoors and be physically active. Studies have shown that well-lit, accessible, and aesthetically pleasing facilities usually attract more use [28].

Obstacles to accessing healthy and nutritious food have contributed to rising levels of chronic disease. A myriad of environmental, social, and economic factors influence food choice. For example, having a full-service grocery store in a neighborhood is associated with higher fruit and vegetable consumption rates, which helps reduce the incidence and severity of disease and hunger versus having a convenience store [29].

Air pollution is a source of harm to the public health of those who exercise outdoors and spend more time breathing polluted air. This includes people who live near highways and ports, workers exposed to air pollution in their jobs, and those who live in homes with poor indoor air quality planning decisions and land use patterns significantly affect the sources of pollution in residential neighborhoods, which are fixed sources: factories and power plants and mobile sources, such as cars and trucks. Identifying sources of pollution is one way to avoid exposing people to pollution levels and maintain public health; other land use strategies that can improve air quality can include agriculture, conservation of green spaces, urban forests, and preservation of open spaces [29].

Policies and guidelines that facilitate mobility can save lives and reduce injuries. More than 50 percent of all fatal motor vehicle accidents occur on major highways of high volume and high speed. The danger of movement at all levels, walking, cycling, and cars, is a significant determinant of the population's activity levels [32].

#### 5.3.7. Work

The 20-minute neighborhood provides local employment opportunities that are economically beneficial to its residents. Studies have indicated that a 20-minute neighborhood offers a flexible workspace. For example, offices, studios, and homework centers. As well as realizing the concept of digital communication, a vibrant local economy helps create different types of jobs and opportunities for individuals to acquire skills for work such as education, training, and volunteering for the local population. The 20-minute neighborhood aims to reach employment opportunities as local services (such as employment centers, employment agencies, and child care) at affordable prices and help neighborhood residents find jobs [30]. The 20-minute neighborhood supports small independent businesses and community-led retailers that are significant projects in the local communities, and this can create local jobs in the residents' homes. The growth of new community-led businesses using their powers directs planning contributions to renovate commercial spaces and provide new areas in neighborhoods with flexible sites that support innovative new companies and jobs and the preservation of wealth within the community [30].

To achieve the 20-minute neighborhood work index, planners can collaborate with developers, businesses, and community groups to develop employment strategies and local skills as part of their plans [3].

Building community wealth aligns with the principles behind the 20-minute neighborhood, focusing on local productive forms of business and employment, ensuring a vital neighborhood hub to support daily needs. Suppose the business remains local and stores, services, and facilities are centralized. In that case, people will be able to actively commute to these destinations, reducing commuting distances and giving people more free time.

## 6. The Practical Framework

### 6.1. Identifying the Study Area

Dora is a large area south of Baghdad overlooking the western shore of the Tigris River. An area surrounds it with dense palm groves. It has many important residential and commercial neighborhoods and complexes. Al-Jumhuriya neighborhood was chosen as a model for the 20-minute neighborhood for the following reasons: The neighborhood retained its residential character despite the significant changes that the rest of the city faced. For example, the commercial and industrial sprawls near the Al-Jumhuriya neighborhood of considerable job opportunities such as the Dora refinery, the large number of universities, and the commercial use represented by retail centers (mall, supermarket) The study area consists of a group of residential neighborhoods represented by

(District 838 and Part of District 840) as a model for a 20-minute neighborhood test. Figure 1 shows the Dora area in the city of Baghdad.

### 6.2. Urban and Planning Characteristics of the Study Area

#### 6.2.1. The Land Use in the Study Area

The study area is characterized by its residential character, as residential use constitutes 80.28% of the neighborhood area. As for commercial services, they constitute 6.17%. At the same time, public services such as education and health include 2.97%. As for the recreational area and the open spaces, they constitute 1.32%. Finally, the transportation rate was 9.26, representing the primary and internal roads of the Jumhuriya neighborhood (Table 1).



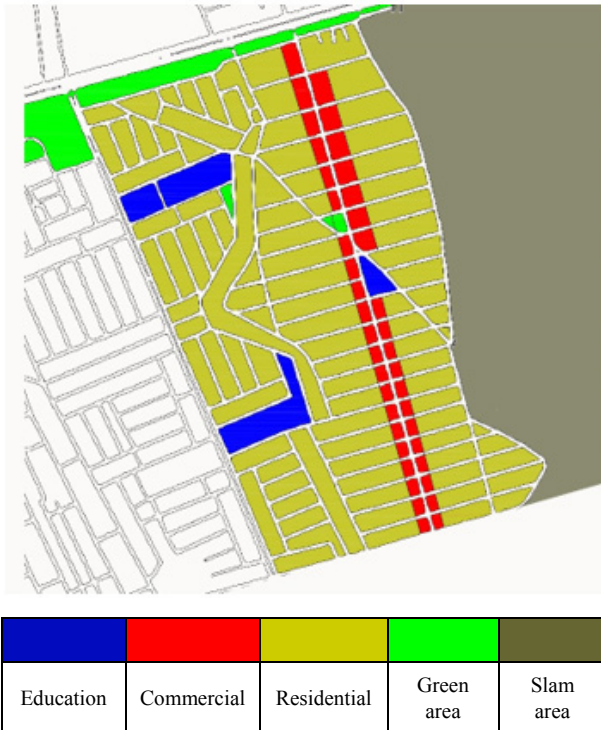
Google maps

**Figure 1.** The location of the study area in Baghdad



**Table 1.** The land use in the study area

| Usage         | Area in hectares | Percentage |
|---------------|------------------|------------|
| Residential   | 182              | 80.28      |
| Commercial    | 14               | 6.17       |
| Services      | 6.7              | 2.97       |
| Entertainment | 3                | 1.32       |
| Transport     | 21               | 9.26       |
| The total     | 226.7            | 100%       |



**Figure 2.** land uses in the study area based on Google earth maps

6.2.2. Analysis of Public Services and Utilities

- housing

The houses in the study area are classified within the modern western design, which depends on openness to the outside by directing the internal spaces in the dwelling, as well as containing the front gardens, which play an environmental and aesthetic role for the study area. As for the materials used in construction, the raw materials used in building walls of dwelling units, represented by the use of bricks and concrete for roofs, and the areas of the dwelling units were divided into three main groups of spaces, the first group with an area of 600-800 square meters, and the second group with areas ranging between 200-400 square meters, and the third group with an area of 150-300 square meters.

- commercial

The markets were represented in the study area in the commercial street along the main street in the area, called

Abu Tayara Street, as there are distributed shops on both sides of the street.

- Public spaces

By studying the urban situation of the study area, it becomes clear that there is a loss of hierarchy in the open public spaces, where there is no central public space except the presence of the commercial street space, while other secondary spaces are non-existent.

6.2.3. Population Characteristics of the Study Area

The population of the study area is 20144, according to the statistics of the municipality of Dora for the year 2019, and the average size of the family in the area amounted to 6.1, and the percentage of females in the study area was 49.4, while the percentage of males was 50.6, as shown in table (2) and figure (3) that show the population pyramid of Al-Jumhuriya neighborhood by age groups.

**Table 2.** Population characteristics of the study area [31]

| Age group | male  | %     | female | %     |
|-----------|-------|-------|--------|-------|
| 4-0       | 1593  | 15.65 | 1515   | 15.20 |
| 5-9       | 1401  | 13.76 | 1327   | 13.32 |
| 10-14     | 1204  | 11.83 | 1158   | 11.62 |
| 19-15     | 1073  | 10.54 | 1038   | 10.42 |
| 24-20     | 956   | 9.39  | 922    | 9.25  |
| 29-25     | 826   | 8.11  | 800    | 8.03  |
| 34-30     | 709   | 6.96  | 693    | 6.96  |
| 39-35     | 596   | 5.85  | 589    | 5.91  |
| 44-40     | 481   | 4.72  | 486    | 4.88  |
| 49-45     | 380   | 3.73  | 393    | 3.94  |
| 54-50     | 296   | 2.91  | 309    | 3.10  |
| 59-55     | 225   | 2.21  | 238    | 2.39  |
| 64-60     | 166   | 1.63  | 176    | 1.77  |
| 69-65     | 116   | 1.14  | 126    | 1.26  |
| 74-70     | 75    | 0.74  | 86     | 0.86  |
| 79-75     | 40    | 0.39  | 50     | 0.50  |
| 80+       | 43    | 0.42  | 58     | 0.58  |
|           | 10180 |       | 9964   |       |

Through table (3), Figure (4), we find that the percentage of the population of young people aged 0-14 years constituted 41%, while the elderly group from 15-64 amounted to 55%, and the elderly group of 65 and over constituted 5%.

Within the characteristics of the population, it was necessary to know the number of workers. Accordingly, a set of questions were asked within the questionnaire form of the elected sample and based on their answers and field surveys. The results showed that the work is not limited to



the category of men only but that there is a large percentage of working women and that the percentage of workers of men and women within the study area is 6.65%, while the percentage of workers outside the region was 33.7%, and

we find that a large percentage of the population of the region 59.65% do not work and they are from the age groups unable to work (children category, students category, and the elderly) as shown in table(4), figure (5).

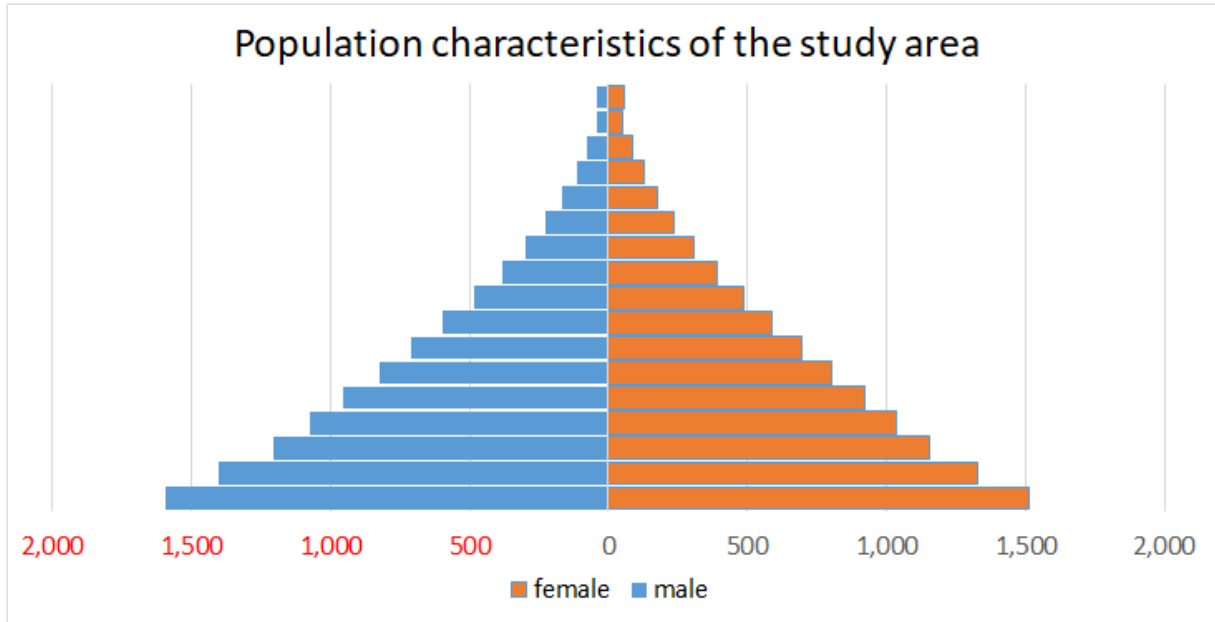


Figure 3. Population pyramid of the study area [31]

Table 3. Distribution of the population by age groups [31]

| Age group | male  | %    | female | %    | Total | %    |
|-----------|-------|------|--------|------|-------|------|
| 0-14      | 4198  | 41   | 4000   | 40   | 8198  | 41   |
| 15-64     | 5542  | 54   | 5468   | 55   | 11010 | 55   |
| 65+       | 440   | 4    | 496    | 5    | 936   | 5    |
|           | 10180 | 100% | 9964   | 100% | 20144 | 100% |

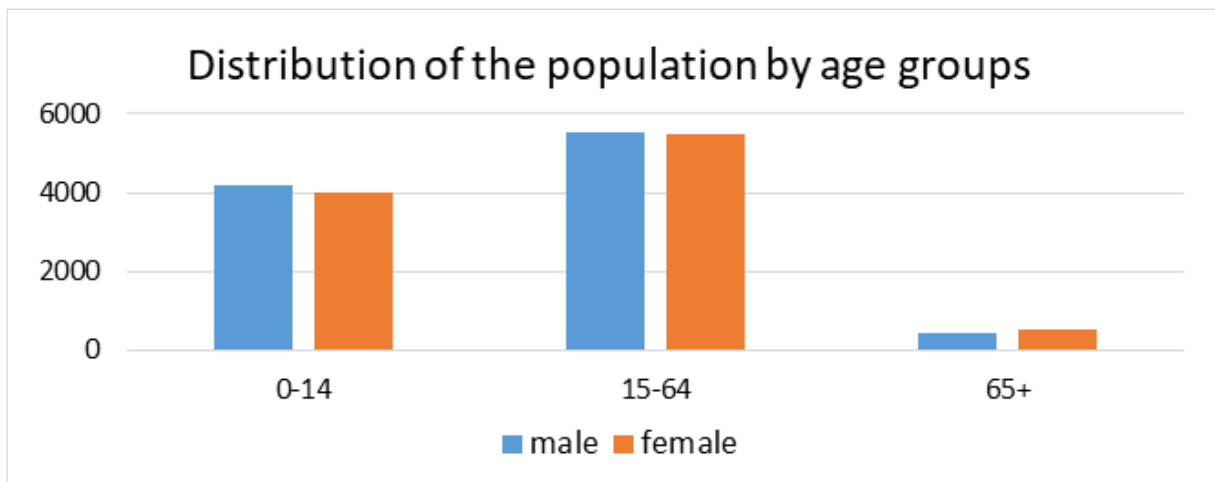
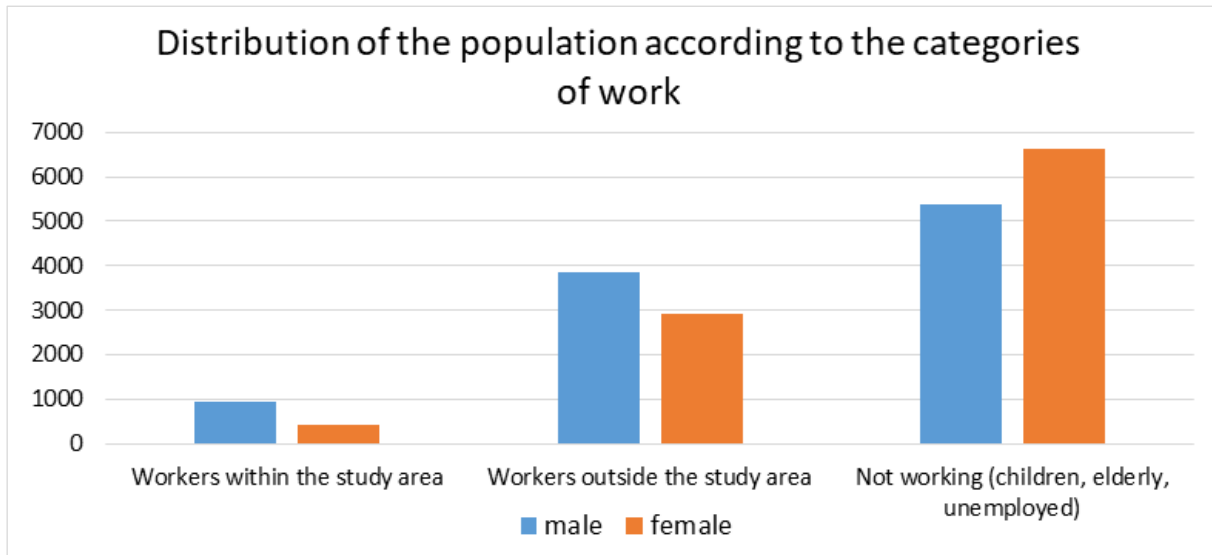


Figure 4. Distribution of the population by age groups

**Table 4.** Distribution of the population according to the categories of work [31]

|   | male  | %     | female | %     | Total | %     |
|---|-------|-------|--------|-------|-------|-------|
| Workers within the study area               | 927   | 9.11  | 413    | 4.14  | 1340  | 6.65  |
| Workers outside the study area              | 3867  | 37.99 | 2921   | 29.32 | 6788  | 33.7  |
| Not working (children, elderly, unemployed) | 5386  | 52.91 | 6630   | 66.54 | 12016 | 59.65 |
|   | 10180 | 100%  | 9964   | 100%  | 20144 | 100   |

**Figure 5.** Distribution of the population according to the categories of work

### 6.3. Analysis of Urban and Demographic Characteristics of the Study Area

Based on what was discussed in the urban and demographic characteristics paragraph, we note that the study area is characterized by the multiplicity and diversity of services, in addition to the fact that a large percentage of the residents of the area are employed, which means that there is a change in their daily activity patterns in terms of going to work, whether inside or outside the area depending on walking or various means of transportation as well as meeting the family's requirements in terms of daily needs since a large percentage of the population are children, elderly and working women, if there is daily activity related to the educational aspect and the possibility of going to kindergartens and schools as well as the recreational aspect such as parks and play ground. In the study area, this indicates the need of this category for special requirements and services that serve them, and based on the foregoing and what was indicated by the urban and demographic characteristics of the study area in terms of the need of its residents for services that enable them to use them safely, comfortably and lively, the area will be tested as being within a 20-minute neighborhood model, by testing the planning indicators (density, proximity, diversity) through a field survey.

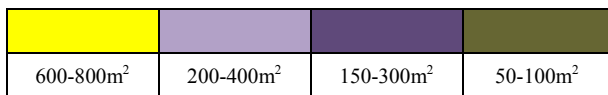
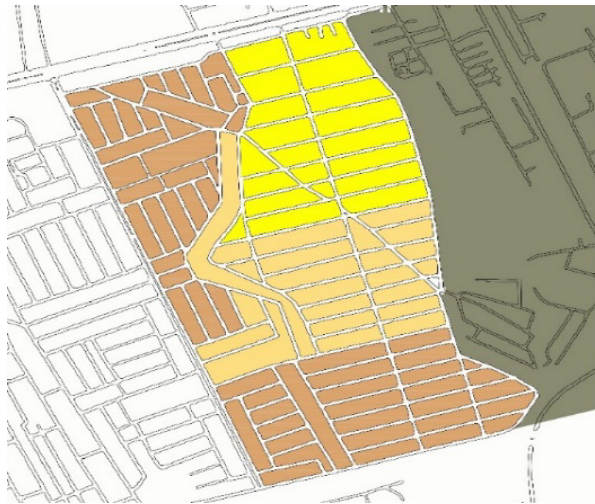
### 6.4. Application of the Planning Indicators to the Study Area

#### 6.4.1. Density Indicator

The study area has a variety of densities, ranging from low density in the north of the region with an average dwelling area of 600-800 square meters to high density in the south and west of the region with an area of 150-300 square meters for the dwelling unit. At the same time, the average density was concentrated in the center of the site, ranging between 200-400 square meters. On the other hand, due to the economic situation in Iraq, in general, and the city of Baghdad in particular, from the declining housing offers in return for the high demand, most housing offers do not match the average income of families, which led to irregular housing secretions ranging from 50-100 square meters (figure 6). It permeated the residential area of Abu Tiara Street. As for random housing in the east of the region, the housing density is very high to the point of overcrowding due to the random segregation of dwelling units that may reach 50 square meters per housing unit.

Analysis of the density index indicates that the density in the residential area achieves the principles of 20-minute neighborhoods, as the housing density has reached 71 dwellings per hectare. The area of these housing units varies between 800 m<sup>2</sup> to 50 m<sup>2</sup>. Thus, it achieves a great

diversity of families in obtaining adequate housing in terms of space, and on the other hand, it achieve a high population density that allows the area's residents to obtain basic services without needing transportation.



Field surveys based on Google maps

Figure 6. the distribution of densities in the study area

6.4.2. Diversity Indicator

Diversity in land use can be measured and determined by adopting a diversity index known as the Simpson Diversity Index SDI. The Simpson Index is one of the most common and powerful ways to measure diversity in a community. The indicator's value depends on the area of each land use to the total area for the uses, as shown in the mathematical equation below. The index's value ranges between (0-1), where the highest value is (1) and indicates a high diversity. The lowest value is (0), meaning there is a dominant use over the rest of the land uses in the study area.

$$D = 1 - \frac{\sum n(n - 1)}{\sum N(N - 1)}$$

Where: Area of use: n  
Total areas of the study area: N  
Diversity Index: D

To find out the diversity index for the study area, the Simpson index will be extracted based on data extracted from the field survey and figure 2, as shown in Table 5.

D = 0.79

The index of diversity in land uses for the study area is (0.79). This figure is good, meaning that there is a diversity of land uses that contribute to fulfilling the residents' desires to obtain essential services in the study area. This encourages the ability to walk in the area.

The analysis of the diversity index indicates that the residential area achieves good diversity, as there is a

diversity in land uses that match the diversity criterion in the 20-minute neighborhoods.

Table 5. The diversity index in the study area

| Usage         | Area in hectares (n) | n(n-1)   |
|---------------|----------------------|----------|
| Residential   | 182                  | 32942    |
| Commercial    | 14                   | 182      |
| Services      | 6.7                  | 38.19    |
| Entertainment | 3                    | 6        |
| Transport     | 21                   | 273      |
| The total     | 205.7                | 33441.19 |

6.4.3. Proximity Indicator

Through figure 7, we find that the education service at the primary and intermediate schools has primarily covered the study area in terms of spatial location and coverage ratio depending on the radius of 800 m.

As for the health services represented by the health center, the coverage rate depends on the radius of 800 m. It covers nearly 50%, while the rest is considered outside coverage.

As for the recreational services represented by open green areas and play areas, we find that the spatial localization of this activity came in the north of the area. Therefore, according to the 20-minute neighborhood standard, large parts of the site are not served.



Figure 7. The study area distance of primary land use

As for the commercial service, according to the nature of the area, the commercial service is distributed in a striped line along Abu Tayara Street and Police Street. Therefore,

the spatial distribution of it according to the standard of the 20-minute neighborhood is within the standard.

The analysis of the proximity indicator indicates the uses in the study area that are within the 20-minute standard of education, health, and shopping. As for the recreational aspect, including open green areas, we find that the spatial localization of this use does not take into account the 20-minute. In addition, its percentage within the total percentage of residential area uses is less than the standard.

Concerning the analysis of the indicators (density, proximity, diversity), it can be said that the residential area has reasonably achieved the primary indicators of the 20-minute neighborhood. To demonstrate the research hypothesis that the main indicators are not sufficient to adopt the concept of 20-minute neighborhoods and that the actual use of the residents of the residential area is the essential indicator to achieve the concept, accordingly the urban activity patterns of a sample of residents in the residential area will be analyzed.

**6.5. Analysis of Urban Activity Patterns of Neighborhood Residents**

After the results of the planning indicators (density, diversity, proximity) showed their achievement in the study area in this paragraph, the sample will be asked about their use of services and benefit from the diversity of services and density to show the congruence between the planning indicators and the use of residents (table 6).

Analyzing the opinion of the sample regarding the indicator of proximity to services. The results indicated that:

- When the sample was asked about the use of the educational service (kindergartens, schools) located in the area, the results indicated that the most significant percentage of the sample used educational services outside the residential area, and the percentage of the sample that used the educational service inside the area indicated that they depended on cars in their daily trips.

- On the level of health services, the results showed that the largest percentage of people depend on health centers and private clinics within the region, and the largest percentage of the sample uses a car to go for that service.
- As for the level of shopping service, the largest percentage referred to shopping from inside the neighborhood. When asked about going on foot inside the neighborhood, the largest percentage referred to not adopting walking and using private cars.

Analyzing the opinion of the sample regarding the diversity indicator in services. The results indicated that:

When asking the sample whether the services within the neighborhood provide diversity and take into account the benefit of all age groups (children, adolescents, the elderly), gender (men's roles, women's roles), and people of determination, the results showed that the most significant percentage of the answers indicated disagreement and lack of feeling diversity of services that meet the needs of the residents within the residential area

Analyzing the opinion of the sample regarding the density index. The results indicated that:

When the sample was asked about adequate housing options, the most significant percentage indicated disagreement.

Through the approach between the application of the planning indicators and the sample answers, we note a fundamental difference between them. Despite the identical planning indicators for the 20-minute neighborhoods (proximity, diversity, density), now that the residential area, according to the analysis of the actual use of its residents through patterns of daily urban activity, does not achieve indicators (Density, Proximity, Diversity) as the most significant percentage of the sample answers do not depend on services, as well as not using walking, which is the basic idea of the 20-minute neighborhood, which is characterized by being vibrant and providing health and safety for its residents.

**Table 6.** Sample opinions of urban activity patterns of neighborhood residents

|  | Meaning | survey result |
|--|---------|---------------|
| Do you use educational services in the Jumhuriya neighborhood  | 2.40    | not agree     |
| Do you rely on Walking In the district of the Jumhuriya to access public services  | 2.60    | not agree     |
| Do you use the health center in the neighborhood to obtain health services   | 2.79    | not agree     |
| Do you rely on the markets in the neighborhood to get your daily-weekly needs  | 2.21    | Somewhat      |
| Does the Al-Jumhuriya neighborhood provide enough options for housing  | 2.26    | Somewhat      |
| Does the Jumhuriya neighborhood provide diversity and interest in Services for families difference Age groups and gender | 2.77    | not agree     |

Through the preceding, and to determine the reality of the residential area and to explain the reason for the inconsistency between the achievement of the planning indicators and the opinion of the sample in the fact that the residential area achieves a 20-minute neighborhood model, the most critical gaps that were the cause of (the residents not using the services of the neighborhood and not adopting walking as a means of transportation as well as based on their opinion that there is no diversity in services) by adopting the mechanisms for each service, which were extracted in the theoretical framework of studies and the extent to which they are achieved in the study area.

**6.6. Discuss the Results of the Questionnaire**

In this part, the results of the neighborhood residents' questionnaire will be discussed about the services provided by the residential area and how close they are to achieving the 20-minute neighborhood goals.

In this section, the questionnaire results for the neighborhood residents will be discussed regarding secondary indicators and analyses according to the Likert scale. The results indicated the following:

- 1- At transportation level, the residents of the area find that it does not meet their daily needs, and the result of the main indicator was 2.135, that is, within the (bad) situation.

**Difficulties to achieve service:** despite the presence of a transparent road network in the neighborhood, it does not achieve opportunities to communicate with nature or the needs of all age groups In the neighborhood, as well as for people with special needs, and on the other hand, the road network in the neighborhood lacks lighting and effective and safe pedestrian access, Table 7.

- 2- At housing level, which is one of the important indicators for the 20-minute neighborhood, we find that the average sample answers for this indicator amounted to (2.05), which is also within the (bad) situation within the five-point of Likert scale.

**Difficulties in achieving service:** this result is logical if we know that the housing sector in the Jumhuriya neighborhood does not achieve a mixture of vertical and horizontal housing. The vast majority of this neighborhood's housing is horizontal and does not achieve this diversity. On the other hand, there is a diversity in the sizes of horizontal housing units in the neighborhood of the Al-Jumhorya, now that it is informal mainly due to the severe shortage of housing stock and the high prices led to many of the owners of housing units to have to release part of their housing unit and establish a small housing unit on it. As for energy, housing in the Jamahiriya neighborhood still depends on traditional energy and building and finishing materials that do not support energy saving, Table 8.

**Table 7.** The results of the transportation index in the district of Al-Jumhuriya

|  | Mean | secondary index rate | main index rate |
|--|------|----------------------|-----------------|
| Opportunities to connect with nature                             | 1.59 | Very bad             | 2.1             |
| Meet the needs of all groups, ages, and people with disabilities | 1.38 | Very bad             |                 |
| a network of several interconnected walking routes               | 2.05 | bad                  |                 |
| street lighting  | 3.2  | Accepted             |                 |
| Lack of empty and neglected spaces                               | 3.2  | Accepted             |                 |
| Providing comfort elements: shade means of guidance              | 1.39 | Very bad             |                 |

**Table 8.** The results of the housing index in the district of Al-Jumhuriya

|   | Mean | secondary index rate | main index rate |
|---|------|----------------------|-----------------|
| A combination of building types (horizontal, vertical housing, etc.)  | 2.05 | bad                  | 2.05            |
| A combination of different sizes of units   | 3.19 | Accepted             |                 |
| Create affordable housing<br>A variety of programs that support the development of housing units and housing projects | 3.19 | Accepted             |                 |
| Nursing homes for aging people  | 1.58 | Very bad             |                 |
| Homes that allow working from home  | 1.47 | Very bad             |                 |
| A combination of building types (horizontal, vertical housing, etc.)  | 1.33 | Very bad             |                 |
| A combination of different sizes of units   | 1.59 | Very bad             |                 |
| Housing of high quality can contribute to belonging to the region   | 2.05 | bad                  |                 |

3- At educational service level, the results of the Likert scale of the questionnaire showed that the average education index reached (1,54), which is at a (very bad) level within the five-point of Likert scale.

**Difficulties in achieving service:** At the low level of education at the city level in general and the Jamahiriya in particular, this decline is based on external factors, including the school's relationship with roads, which is terrible regarding safety and furnishing the roads linking schools and the residential area. As for the internal factors, the most important of them is the school's environment itself in terms of overcrowded classrooms and double shifts, which in some schools in the Al-Jumhuriya neighborhood reach 3 shifts due to the high density of the residents of the neighborhood and the small number of these schools

(Table 9).  
 4- The green infrastructure level was recorded in the Al-Jomhouria neighborhood (1.87) within the level of (bad) according to the five-point Likert scale. The percentage was selection of reality of the weak green infrastructure, as there are no green spaces within the planning standards at the level of space or spatial distribution and accessibility.

**Difficulties in achieving service:** the case study still does not depend on modern technologies for a sustainable green infrastructure. Therefore, there are no gardens at the neighborhood level that can contribute to food production. The poor gardens of each housing unit also began to decay due to the random excretion of housing units (Table 10).

**Table 9.** The results of the education index in the district of Al-Jumhuriya

|   | Mean | secondary index rate | main index rate |
|---|------|----------------------|-----------------|
| The road between Home and School  | 2.35 | bad                  | 1.54            |
| The school environment itself   | 1.33 | Very bad             |                 |
| Focus on safety, health, and community services   | 1.58 | Very bad             |                 |
| Opening school buildings and playgrounds when not in use  | 1.33 | Very bad             |                 |
| Efficiently accessible facilities and places for community education  | 1.33 | Very bad             |                 |
| Streets connected to schools are free of cars, and roads are closed to vehicles for a short period or permanently | 1.33 | Very bad             |                 |

**Table 10.** The results of the green infrastructure index in the district of Al-Jumhuriya

|  | Mean | secondary index rate | main index rate |
|--|------|----------------------|-----------------|
| For outdoor spaces such as trees and rain gardens to control rainwater flows                           | 1.67 | Very bad             | 1.87            |
| Food Producing Gardens   | 1.58 | Very bad             |                 |
| Green walls and roofs  | 1.33 | Very bad             |                 |
| Rain tanks and permeable pavement  | 1.33 | Very bad             |                 |
| Spaces surrounding the personal home, including (back and front yards, porches, driveways, and patios) | 1.33 | Very bad             |                 |
| Regular maintenance<br>Finance, innovations  | 1.33 | Very bad             |                 |
| Flexible workplace represented by the office, studio, and homework center                              | 1.33 | Very bad             |                 |
| For outdoor spaces such as trees and rain gardens to control rainwater flows                           | 1.33 | Very bad             |                 |



- 5- The social structure level was (1.37), according to the five-point Likert scale, which is the lowest percentage on the level of the seven indicators studied in the Jumhuriya neighborhood.

**Difficulties in achieving service:** Among the most important reasons for the low result of the service are: the poor availability of many public services such as libraries or public park, or the lack of schools and the weakness of their spatial distribution is reflected in the strengthening of social relations in the region and the opportunity for social interaction for the residents of the Al-Jumhuriya neighborhood. Another reason is the lack of some essential services such as drinking water within international standards and specifications, in addition to the small number of these social spaces, if available, do not support

Clearly, the age or gender diversity of the residents of the area, and therefore most of the sample of the Jumhuriya neighborhood agreed that these services are very poor (Table 11).

- 6- Health service level, for its part, was recorded in the Jumhuriya neighborhood (1.96), which is also poor within the five-point Likert scale, according to the sample answers to the Jumhuriya neighborhood. The primary provider of this type of service is presented in Table 12. The neighborhood contains one health center within the northern part, which provides only basic services without specialization, forcing the residents of the neighborhood to go out to the city center or the main sectors that provide this type of services.

**Table 11.** The results of the social infrastructure index in the district of Al-Jumhuriya

|  | Mean | secondary index rate | main index rate |
|--|------|----------------------|-----------------|
| Gathering areas of public ownership represented by public schools  | 1.37 | Very bad             | 1.37            |
| Public parks, libraries, privately owned gathering areas   | 1.58 | Very bad             |                 |
| Temporary Streets of Play  | 1.33 | Very bad             |                 |
| Essential services available such as drinking water and public toilets   | 1.33 | Very bad             |                 |
| Meeting the needs of all age groups and stages of life, recognizing that different age groups have different needs | 1.33 | Very bad             |                 |
| Using these spaces at different times of the day, throughout the year, and in various types of weather             | 1.33 | Very bad             |                 |

**Table 12.** The results of the health index in the district of Al-Jumhuriya

|  | Mean | secondary index rate | main index rate |
|--|------|----------------------|-----------------|
| community health centers<br>multipurpose places                                | 1.61 | Very bad             | 1.96            |
| Having a full-service grocery store versus having a ready-made food store      | 1.59 | Very bad             |                 |
| Proximity to highways  | 1.59 | Very bad             |                 |
| Indoor air quality homes   | 2.79 | Accepted             |                 |
| Proximity/d from fixed sources of pollution (factories and power stations)     | 2.79 | Accepted             |                 |
| Proximity/distance from moving sources of pollution (cars and trucks)          |      |                      |                 |
| Agriculture, green space conservation, urban forestry, open space conservation | 2.05 | bad                  |                 |
| community health centers<br>multipurpose places                                | 2.05 | bad                  |                 |
| Having a full-service grocery store versus having a ready-made food store      | 1.59 | Very bad             |                 |
| Proximity to highways  | 1.59 | Very bad             |                 |

7- Work level, in the Jumhuriya neighborhood scored (1.95) according to the five-point Likert scale based on the response of the elected sample to the Jumhuriya neighborhood, which is also a bad level record, as is the case for the rest of the previous indicators.

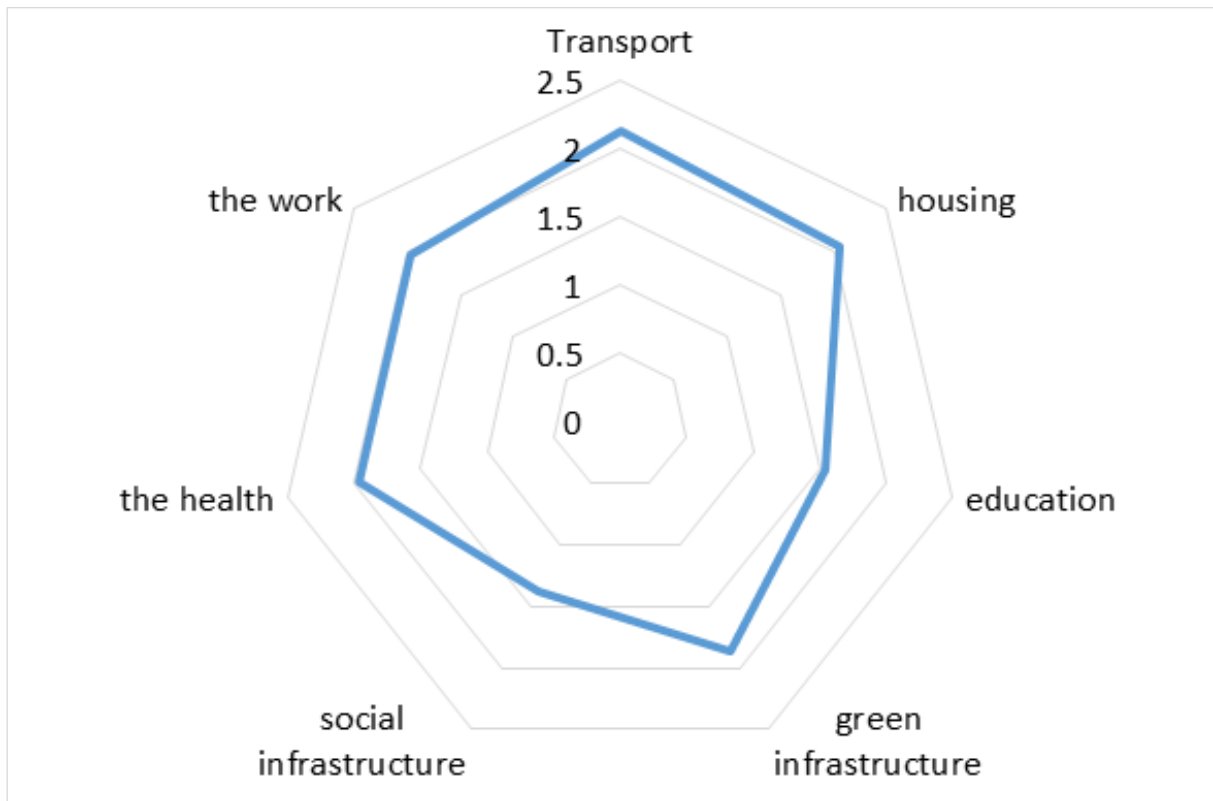
small or medium businesses, and is also weak in the digital technological infrastructure, and on the other hand, the weakness of small companies that provide job opportunities for the residents of the neighborhood led to the weakness of this indicator (Table 13).

After the secondary indicators were discussed separately, Figure (8) shows a summary of the results of the secondary indicators based on the results of the selected sample's response.

**Difficulties in achieving service:** Al Jumhuriya neighborhood does not provide a flexible space to support

**Table 13.** The results of the work index in the district of Al-Jumhuriya

|   | Mean | secondary index rate | main index rate |
|---|------|----------------------|-----------------|
| Achieving the concept of digital communication, meaning economy, Helps to create different types of jobs            | 1.59 | Very bad             | 1.95            |
| Policies and guidelines that facilitate mobility save lives and reduce injuries                                     | 2.05 | bad                  |                 |
| local services (e.g., job centers and placement agencies, small independent companies, and community-led retailers) | 2.13 | bad                  |                 |
| Small independent businesses and community-led retailers  | 1.96 | bad                  |                 |
| Flexible spaces that support innovative new businesses and functions  | 2.05 | bad                  |                 |
| It gives people more free time and the possibility to work at that time   | 1.96 | bad                  |                 |



**Figure 8.** Application of secondary indicators

## 7. Recommendation

- This research aims to achieve a dual goal: on the one hand, providing insights into the idea of planning 20-minute neighborhoods and the essential characteristics of urban planning within those neighborhoods. On the other hand, it emphasizes the importance of man and his use of the 20-minute neighborhood to support those characteristics and add other features. At different levels, the inhabitant's activity patterns are supported so that the neighborhoods are more suitable for living. 20-minute neighborhoods can support transformative social and economic changes, which will be necessary to address some of our significant challenges. It provides us with a layer of resilience against those challenges, whether the pandemic, the climate crisis, health, green recovery, or isolation and loneliness. Based on this, the 20-minute neighborhood planning is a collaborative process in which several sectors of government, the private sector, and the community are linked to obtain and share resources and expertise.
- Neighborhood planning does not require 20 minutes with its skip indicators to work. This depends on the effective use of the neighborhood residents, and they are the only ones who recognize the success of the area or not.
- Presentation of 20-minute neighborhoods involves understanding a particular place's opportunities and challenges. It requires making decisions to make the best use of redundant and vacant land and buildings and to retain, reuse and modify structures to harness the benefits of the concept. New and emerging venues will require careful planning and consideration of the many services needed for the community to deliver a 20-minute neighborhood.
- The 20-minute neighborhoods offer the possibility to give a new definition according to the criteria of functional reconfiguration based on the presence of a network of spaces that connect the social and economic dimensions and the quality of living and ensure a sense of community, identity, and belonging to the neighborhood.
- The research recommends that when planning a 20-minute neighborhood, we should first think about what we want to do and then connect all relevant sectors and departments and make everyone work together.

The research recommends the importance of overlap between urban and community planning and design at all levels. From the largest to the smallest, as well as an urban analysis of urban activity patterns within neighborhoods to achieve neighborhoods within the concept of 20 minutes, which are not characterized by general planning indicators that fit all areas anywhere in the world, but rather are

characterized by hands stemming from the needs of the population themselves and their patterns of urban activity within the neighborhoods.

The research recommends developing educational programs for primary and secondary students for graduate studies to express the importance of 20-minute neighborhoods. Student resources can provide the opportunity to participate in neighborhood planning.

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