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RESHAPING CITIES: A SUSTAINABLE TOMORROW WITH THE 15-MINUTE MODEL

Fatma E. Mohamed *, Mohamed A. Elaziz , Asmaa S. Gabr
Urban Planning Department, Faculty of Engineering, Al-azhar University, Cairo, Egypt.
***Correspondence:** faraghassan14@gmail.com

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ABSTRACT

The purpose of the study is to investigate the fundamental principles, sustainability impacts, and implementation challenges associated with the 15-minute city concept. We demonstrate its reliance on seven core principles: human-scale urban design, density, diversity, flexibility, proximity, digitalization, and connectivity. to contribute to sustainability across social, economic, and environmental dimensions. Nevertheless, critiques have emerged, highlighting the 15-minute city perceived physical determinism and its purported neglect of diverse social group needs, biodiversity, energy efficiency, clean energy, as well as cultural and heritage considerations. Until now, 15-minute cities have shown some positive results in many cities around the world. Studies and experiments indicate some benefits and positive effects achieved by this idea, such as improving the quality of life and encouraging residents to use sustainable transportation, which reduces traffic congestion and carbon emissions, and also improving the general health of the population by encouraging people to walk and ride bicycles. This can contribute to improving physical fitness.

KEYWORDS: Eco-city, Conspiracy theory, COVID-19, climate lockdown, compact city, the 15-minute city Criticisms.

إعادة تشكيل المدن: غد مستدام باستخدام نموذج الـ 15 دقيقة

فاطمة السيد محمد*، محمد عبد العزيز، أسماء صلاح جبر
قسم التخطيط العمراني، كلية الهندسة، جامعة الأزهر، مدينة نصر، 11884، القاهرة، مصر.
***البريد الاليكتروني للباحث الرئيسي :** dr.basuony2016@azhar.edu.eg

الملخص

تهدف هذه الدراسة إلى دراسة المبادئ الأساسية وتأثيرات الاستدامة وتحديات التنفيذ المرتبطة بمفهوم مدينة الـ 15 دقيقة. ونحن نثبت اعتمادها على سبعة مبادئ أساسية: التصميم الحضري على نطاق الإنسان، والكثافة، والتنوع، والمرونة، والقرب، والرقمنة، والاتصال. وتقدم هذه المبادئ مساهمات محتملة في الاستدامة الاجتماعية والاقتصادية والبيئية. ومع ذلك، فقد ظهرت انتقادات، تسلط الضوء على الحتمية المادية المتصورة لمدينة الـ 15 دقيقة وإهمالها المزعوم لاحتياجات الفئات الاجتماعية المتنوعة، والتنوع البيولوجي، وكفاءة الطاقة، والطاقة النظيفة، فضلاً عن الاعتبارات الثقافية والتراثية. حتى الآن، أظهرت مدن الـ 15 دقيقة بعض النتائج الإيجابية في العديد من المدن حول العالم. وتشير الدراسات والتجارب إلى الفوائد والآثار الإيجابية التي تحققها هذه الفكرة، مثل تحسين نوعية الحياة وتشجيع السكان على استخدام وسائل النقل المستدامة، مما يقلل من الازدحام المروري والانبعاثات الكربونية، وأيضا تحسين الصحة العامة للسكان من خلال تشجيع الناس على المشي وركوب الدراجات مما يساهم في تحسين اللياقة البدنية.

الكلمات المفتاحية : مدينة ال15 دقيقة، المدينة المدمجة، المدينة الصديقة للبيئة، المدينة الذكية، الاستدامة، كوفيد-19، تغير المناخ.

1. INTRODUCTION

The concept of the city has evolved in different eras to reflect the development in human activities and parallel with the development in various scientific fields and to confront natural disasters and epidemics. After existing traditional cities were characterized by countless urban problems such as overcrowding, congestion, air pollution, visual noise, unemployment, and insufficient resources [1].

The introduction of automated cars was initially hailed for its potential in enhancing mobility, commerce, and social connectivity across different classes. However, it has brought about adverse effects on both the social and economic aspects. In urban areas, the introduction of cars has transformed the landscape of urban planning, giving rise to linear and perpendicular city networks. Unfortunately, this has led to detrimental outcomes such as urban sprawl and a decline in air quality due to heightened emissions and increased fuel demand, contributing to climate change.The repercussions extend to biodiversity, as the proliferation of cars has further fueled urban sprawl, negatively impacting green reserves, forests, and fertile land[2].

Furthermore, an unforeseen catalyst for advancing sustainability in urban areas arose with the emersion of the COVID-19 pandemic. This pandemic has necessitated the development of new and innovative methods for cities to sustain their economies while adhering to strict health protocols. The pandemic laid bare the vulnerabilities of existing city institutions, underscoring the imperative for a profound reassessment [3].

Therefore, it was necessary to search for a new model of urbanization that responds to the principles of sustainable development and achieves a quality of life for the population. Hence, the “15-minute city concept” began to be highlighted. And Moreno sees who was working on developing this concept long before the outbreak of the epidemic The idea of 15-minute cities came as a response to the climate change crisis and the Covid-19 pandemic, by increasing environmentally friendly initiatives in neighborhoods, reducing the use of transportation, and solving the problem of urban sprawl. But he says the quarantine has helped put the concept of 15-minute cities on the priority list of major cities around the world [4].

It is a concept that calls for reshaping the city planning vision to transform it into flexible models in which residents can reach their goals within a short time on foot. This concept also focuses on the importance of building urban entities in which all community facilities are available, especially workplaces, housing, entertainment, and shopping places that are connected, efficiently, via pedestrian paths, so that reaching the target destination does not take more than 15 minutes, on foot.

Hence, This study seeks to delve into and examine the concept of the "15-minute city" as an alternative layout model in the context of the COVID-19.

2. Materials and Methods

The findings presented in this study draw upon a diverse array of contemporary sources, encompassing books, online resources, and journal articles in the field of urban planning. Our data compilation comprises over 100 documents that delve into the foundational principles, sustainability benefits, and critiques surrounding the 15-minute city concept. Employing an inductive approach for qualitative content analysis, our methodology seamlessly integrates data collection and extraction with the analytical process, facilitating a gradual construction of the discussion.

3. The evolution of urban planning movements leading to the 15-minute city: a historical and theoretical framework

3.1. Historical framework

Discussions among urban planners have frequently revolved around neighborhood planning, a practice that has persisted since the era of the Industrial Revolution. This trend gained prominence, particularly during the XX century, as the inadequacies of big cities in catering to the day-to-day necessities of their inhabitants became increasingly evident.

Fig. 1. shows Illustrates the chronological progression of neighborhood planning movements from the late nineteenth century onward.

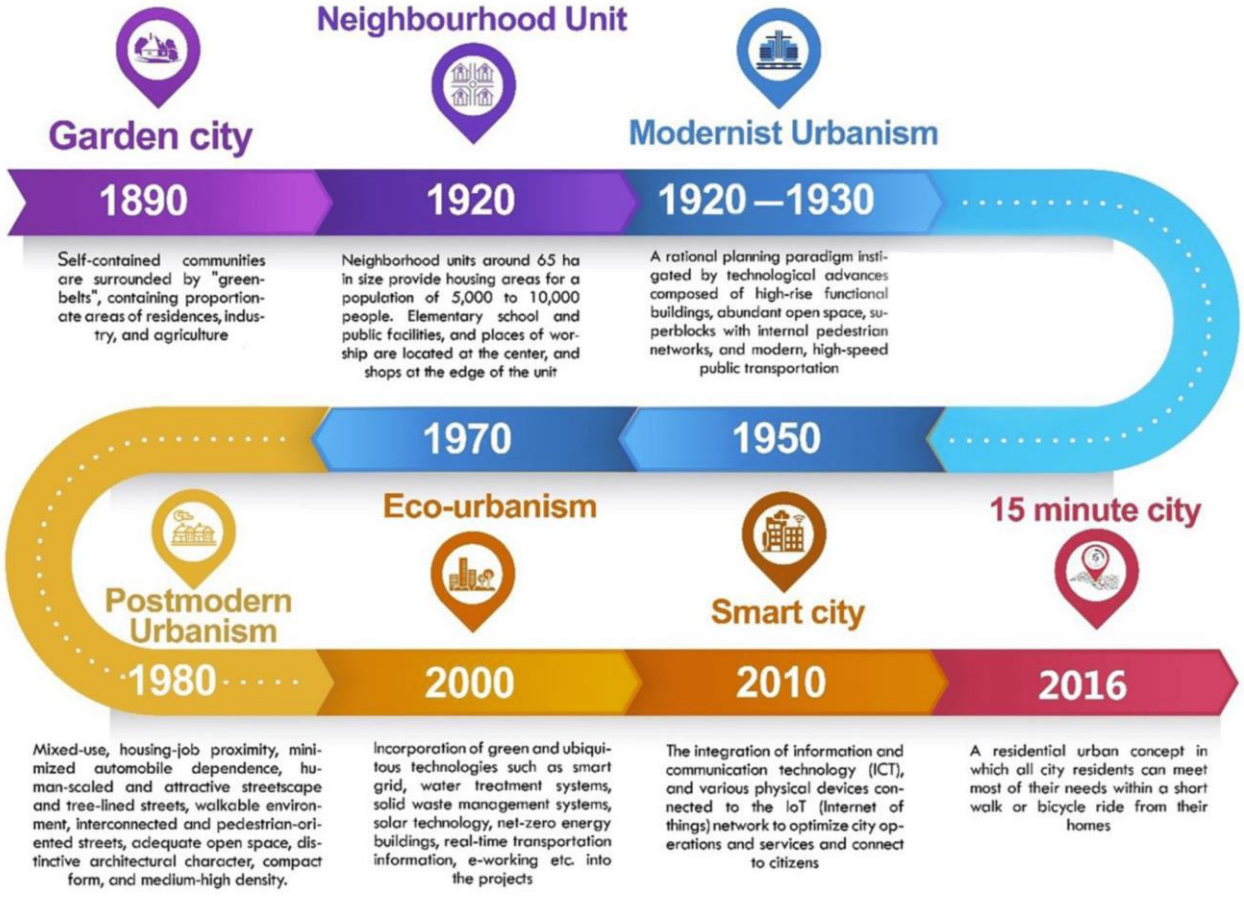

Fig. 1. The historical development of city planning leading to the 15-minute city.

From Fig. 1 we can identify two approaches to planning movements:

- Emphasizing proximity, this approach aims to enhance urban functionality by strategically distributing services and facilities throughout city centers, spanning from concepts like the garden city and residential neighborhoods to the contemporary design of the 15-minute city.
- Centering on mobility, which emphasizes the centrality of urban functions and focuses primarily on car use, such as the period of modern urbanism and the Great Block.

3.2. Theoretical framework

3.2.1 The emergence and the concept of “15-minute city”

The concept of 15-minute cities has become widespread in recent years and has gained more attention around the world, especially in the world of urban planning and design, as it has revolutionized the way we envision cities and redefined our relationship with urban spaces. In this part, we will study the emergence and concept of the 15-minute city.

3.2.1.1 The emergence of “15-minute city”

The 15-minute city has drawn its elements from many urban thinkers and planners over the decades. In the 1920s, Clarence Perry, an American urban planner, proposed the idea of a livable neighborhood [5].

In 1962, the city of Copenhagen banned cars from entering some of its main shopping streets and designated them for pedestrians only. And in the 1980s, a movement spread in the United States calling for designing walkable cities.

This idea is originally attributed to the French-Colombian scientist Carlos Moreno, an urban planning specialist and professor at the Sorbonne University in Paris, who proposed it in 2016 as a solution to the high level of pollution in the city of Paris [6]. Moreno says that he was inspired by the writings of Jane Jacobs for the impression of the 15-minute city [7].

In 2020, the Mayor of Paris, Anne Hidalgo, made this principle the basis of her successful re-election campaign. Anne Hidalgo, through the “Paris en Commun” program, spoke about the concept of the “15-minute city” that Carlos Moreno envisioned in 2016 Trying to win a second term as mayor of Paris, which she did successfully in 2020 [8].

Subsequently, This concept has been replicated in various cities globally, capturing the attention of international organizations such as the World Health Organization (WHO), the United Nations Human Settlements Programme, the Organization for Economic Co-operation and Development (OECD), and the C40 Cities for Climate Leadership. Their shared aim is to enhance the quality of life, especially in the context of the COVID-19 pandemic and beyond.

3.2.1.2 The concept of “15-minute city”

In the wake of the Paris Climate Change Conference in 2015, Carlos Moreno introduced the concept of the 15-minute city in 2016 as a strategy to mitigate greenhouse gas emissions[9].

Morono views the "15-minute city" as an innovative paradigm for urban planning. He said that Cities must be designed - or redesigned - so that city residents of all ages, backgrounds, and abilities can access their daily needs (housing, work, food, health, education, culture, and entertainment) within a 15-minute walking or cycling distance, in addition to the availability of complementary services.

Morono added that Urban quality of life is completely inversely proportional to the amount of time used in transport, and when these elements are applied to existing cities, Residents in the city will have a higher quality of life, as they will be able to enjoy six urban social functions essential to maintaining a dignified urban life, which includes (living, work, commerce, health care, education, and enjoyment) [6].

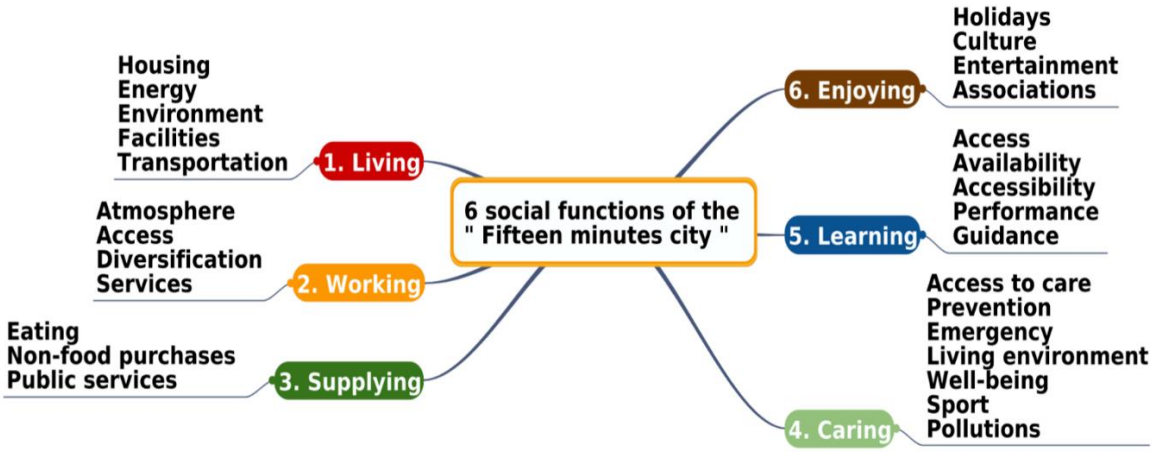

Fig. 2. Basic urban social functions in the "15-minute city"

City officials and urban planners supported the idea of "15-minute cities" as a way to address climate change, as this model supports the idea of decentralization and moving away from the use of private vehicles, which at the same time reduces the use of fossil fuels.

Moreno says that this model does not call for a return to village life. Rather, the 15-minute city is an urban theory par excellence that promotes urban life with all its advantages: vitality, creativity, diversity, innovation, active citizen participation, and the use of technology for the benefit of all.

From the above, the researcher believes that: "The 15-minute city is a new urban paradigm that encourages a human-oriented and environmentally friendly urban future. It can be applied when redesigning existing cities and when planning new cities or urban areas, It has become easier for residents of certain urban areas to ride a bike or walk comfortably to any specific point within the city in a time not exceeding 15 minutes.The 15-minute city model also restores the characteristics of ancient cities, adapting to contemporary lifestyles".

3.2.2 Comparison between the 15-minute city and similar planning models:

After studying the concept of the 15-minute city and comparing it with analogous neighborhood planning movements in the same time period, such as (compact city - eco-city - smart city), the comparison was made through the following:

3.2.2.1 Depending on the most popular model

The figure shows a Google Trends analysis comparing the 15-minute city, smart cities, compact city, and eco-city based on the most popular model.

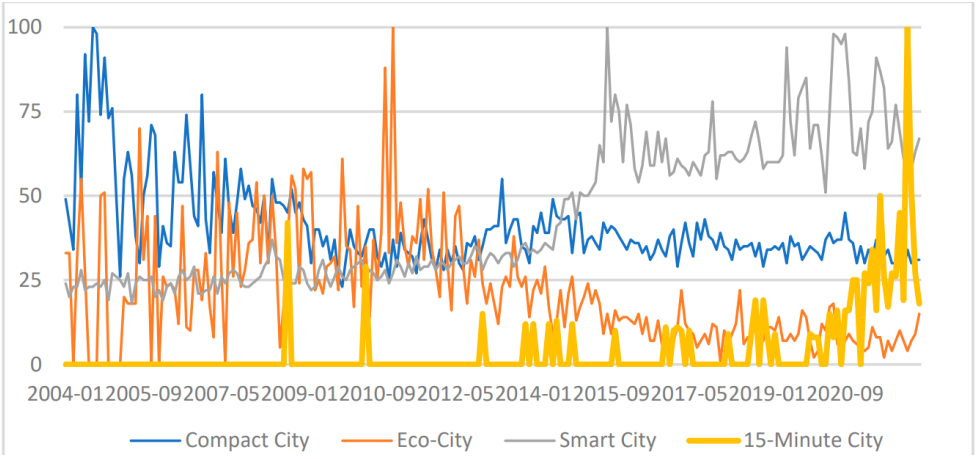

Fig. 3. The analysis of Google Trends reveals the relative popularity of the 15-minute city when compared to models such as the smart city, compact city, and eco-city.

Google Trend analysis shows that: The popularity of the 15-minute city has increased compared to the smart city, compact city, and eco-city models, especially in the period from 2020 to 2023 during the Covid-19 epidemic and after the adoption of the 15-minute city by governments and decision makers. Although The smart city was the most popular from the moment of its appearance until 2020.

3.2.2.2 Depending on sustainability standards

Table 1 shows a comparison between the 15-minute city and similar models Based on sustainability standards:

From the table we conclude that:

- While the 15-Minute City stands out as a effective and holistic example for achieving comprehensive and sustainable urban development, it might overlook certain criteria crucial for achieving sustainability. These Standards include environment protection, Biological diversity, the construction of energy- saving buildings, preservation of local vernacular language, promotion of cultural heritage, and preservation of identity.
- In contrast to eco-cities, the 15-Minute City faces criticism for not adequately addressing the creation of energy-efficient residential spaces, particularly in light of the significant global energy consumption by buildings.
- It is worth noting that energy strategies in the 15-minute city focus Primarily at the city planning level, neglecting Smaller schematic scales such as suburbs.

From the above, while the concept of the 15-minute city has gained traction as a response to contemporary urban challenges, comparison with previous neighborhood planning movements reveals potential shortcomings in addressing some sustainability criteria. However, it remains one of the most successful and comprehensive models for ensuring comprehensive and sustainable urban development.

Table 1. Comparison between the 15-minute city and similar models based on sustainability standards: The symbol **(✓)** indicates achieving the goal and the symbol **(×)** indicates not achieving it.

	Sustainability Aspect and Criteria	Compact City	Eco-City	Smart City	15-Minute City
Environment	Development in existing urban areas	✓	×	✓	✓
	Agricultural and rural lands protection	✓	✓	✓	✓
	Green infrastructure provision	✓	✓	✓	✓
	Environmental protection (ecology, biodiversity, etc.)	✓	✓	×	×
	Lowering transport-related energy use	×	✓	✓	✓
	Shorter commuting time	✓	✓	✓	✓
	Reducing energy waste	✓	✓	×	✓
	Energy-efficient buildings	✓	✓	✓	×
	Clean and green energies	✓	✓	✓	✓
	Higher physical activity	✓	✓	✓	✓
	Decentralization of urban services	×	✓	✓	✓
	Addressing spatial and temporal gaps in access to urban services	✓	×	✓	✓
	Complementing public transportation	✓	✓	✓	✓
	Walkability	✓	✓	✓	✓
	Accessibility	✓	✓	✓	✓
	Reduced car dependency	×	✓	✓	✓
	Distribution of business activities	✓	×	✓	✓
	Providing the required density to support businesses	✓	✓	✓	✓
	Job–housing proximity	✓	✓	✓	✓
	Addressing spatial mismatch	✓	×	✓	✓
	Job–skill mismatch	✓	✓	✓	✓
	Minimum transportation costs	✓	✓	✓	✓
	Population threshold to support businesses	✓	✓	✓	✓
	Minimum infrastructures costs	×	✓	×	✓
	Reducing parking demand	✓	✓	✓	✓
Social	Inclusive and equitable community	✓	✓	✓	✓
	Affordable housing	×	×	✓	✓
	Increasing safety	✓	✓	✓	✓
	Community facilities and civic spaces	✓	✓	✓	✓
	Resident participation	✓	✓	✓	✓
	Promotion of social encounters	✓	✓	✓	✓
	Shorter daily commuting	✓	✓	✓	✓
	Reducing road accident	✓	✓	✓	✓
	Local vernacular, culture, heritage, and identity	✓	✓	✓	×

3.2.3 The Covid-19 pandemic and the need for the 15-minute city

Although the term "15-minute city" was coined in 2016 by Professor Carlos Moreno, planners, decision-makers, and local residents did not develop sufficient awareness of the 15-minute city except in two periods. The following chart comes from a Google Trend search for global use of the term from 2018:2023

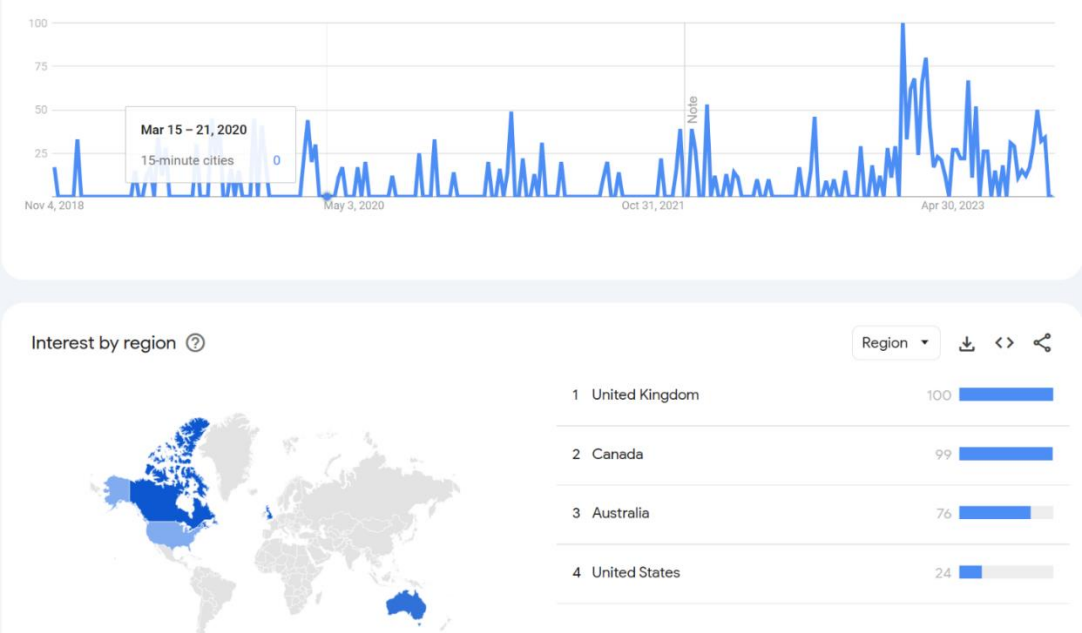

Fig. 4. A chart from Google Trend showing the global use of the term "15-minute city" from the year 2018:2023.

From the following graph, we notice that people's interest in the term 15-minute city peaked in two periods: November 2020 and March 2023:

- November 2020 It was during the COVID-19 pandemic that the term 15-minute city really took hold on a global level when Paris Mayor Anne Hidalgo made it a big part of her 2020 Rerun of the elections. For her, pedestrian- and bicycle-centric design was the future.
- In March 2023, after the adoption of the 15-minute city by UN-Habitat, the World Economic Forum, the 40 Cities Global Climate Network, and the United Local Government Union, the 15-minute city sparked controversy and demonstrations in Oxford and Canada over the conspiracy theory, with some claiming it would imprison people within a 15-minute radius from their homes.

  This decentralized urban planning model has become a rallying cry for politicians and urban activists around the world who are tired of single-use zoning, car-centric development, detached homes, retail shopping, and other amenities.

4. The principles and criteria of the "15-minute city"

In this part, the basic principles that constitute the 15-minute city will be studied from the point of view of scholars and planners from the moment the concept appeared.

4.1 Basic principles of the "15-minute city" concept

depending on **Fig. 5.** by Moreno, we conclude that the 15-minute city consists of four basic dimensions: (1) proximity, (2) density, (3) diversity, and (4) digitalization. Some urban planners added three complementary dimensions to complete the principles of the 15-minute city: (5) Human-scale urban design, (6) flexibility, and (7) connectivity. Each dimension will be discussed briefly below:

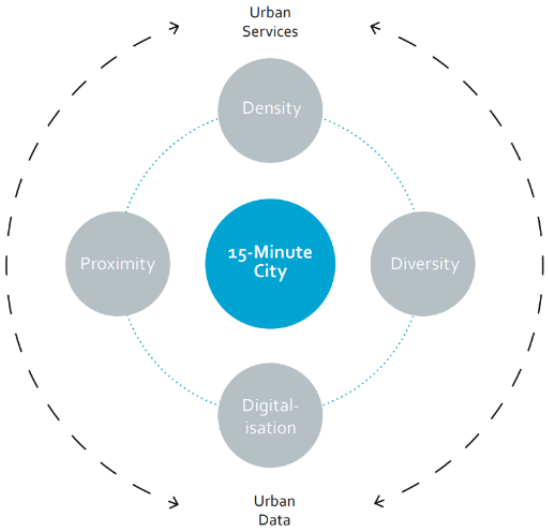

Fig. 5. The basic principles of the "15-minute city" concept

4.1.1 Proximity

The 15-minute city relies heavily on proximity. Proximity not only allows people to access public services and facilities, but also greatly affects their ability to protect themselves in areas such as health, education and to have additional time to enjoy leisure activities. When implemented, proximity can allow a slight reduction in the number of vehicles in urban areas [9].

For example, in Paris, Mayor Hidalgo, an advocate of this novel concept, proposed the conversion of schoolyards into public parks accessible to the community beyond school hours. This initiative encourages local residents to maximize the utilization of nearby public spaces, green areas, and other communal infrastructure. Furthermore, it empowers them to leverage existing resources, including cultural heritage, to attain social, economic, and environmental advantages [8].

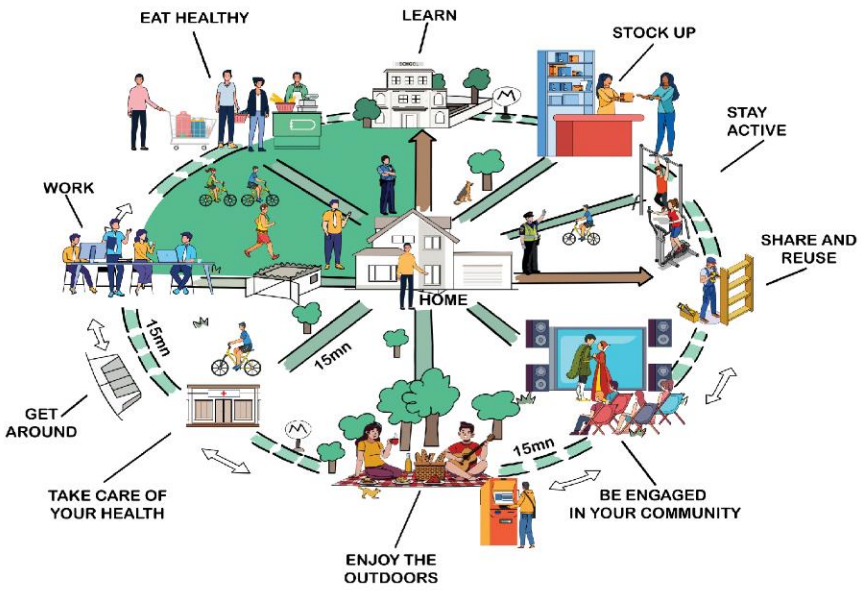

Fig. 6. The figure shows the importance of the proximity element in the 15-minute city, which meets human needs.

4.1.2 Density

Density stands as a pivotal aspect of a city and its constructed environment. Traditional planning often perceives density through the lens of towering structures. However, this approach has given rise to challenges, such as heightened resource consumption and a disproportionate reliance on fossil energy to fuel buildings. Consequently, this has led to a surge in the number of cars within urban areas[10].

But in the concept of the 15-minute city, Density is displayed based on the number of people per square kilometer, The focus here is on the optimal population density that will allow sustainability, create healthy social relationships, limit the use of cars, and allow Optimal resource consumption. This density makes it possible to create infrastructure such as bike lanes and walkable paths that reduce the need for cars, enhancing the fulfillment of the social functions envisioned by Moreno [11].

This dimension achieves justice by distributing resources and services fairly and disseminating services at a low cost to cities, which increases Valuable to investors and governments alike. As part of this vision, it can be said that density is an essential component that favors the social sustainability dimension of cities [12].

4.1.3 Diversity

Within the 15-minute city concept, Moreno depicted diversity by considering two key factors:

- Diversity in the physical environment (neighborhood)
  Moreno believes that the city should rely entirely on mixed-use neighborhoods (commercial, residential,...) where work, services, and basic amenities are easily reachable. It means neighborhood must include at least the elements of housing, commerce, government, health care, education, and enjoyment [6].

- Diversity in the people who live in it

> Diversity in people that hosts and encourages a diversity of cultures from different backgrounds, making social functions more prosperous and diverse. The 15-minute city is considered a new model of proximity and justice, as the city's design makes it accessible to everyone regardless of age, gender, ethnicity, hijri background, language, income, level of education, employment, persons with disabilities and their special needs for access and mobility [11].

Adopting a diversity approach in planning the 15-minute city will not only allow for the realization of proximity, but will also help reduce dependence on cars. Statistics say that there are already more than two billion vehicles in cities and Its contribution of 29% of global emissions, which hinders sustainability, cannot be ignored [13].

Peppery and others argue that adopting a diversity approach will allow the 15-Minute City to align with global goals to reduce emissions, overconsumption of resources, and other practices that hinder sustainability efforts[14]. Moreover, this approach can contribute to achieving Sustainable Development Goal 11 (make cities and human settlements inclusive, safe, resilient and sustainable[15] and also encourage cultural diversity of people and encourage economic growth as a result of increased aspects of creativity, innovation and diverse cultures [16].

4.1.4 Digitalization

While digitalization was not initially a core principle of the 15-minute city, the capabilities offered by smart technologies in the COVID-19 pandemic have convinced defenders of this concept to integrate smart city technologies to bolster other principles. Smart technologies, including big data and the Internet of Things, enable planners to access real-time data, enhance citizen participation in planning and decision-making, and enable local residents to make optimal use of water and electricity resources[17].

Digitization was effective when combined with the proximity dimension, as emphasized by the concept of a smart city, providing services Like online shopping [18] , cashless transactions, and virtual interaction and communication were implemented and promoted [19] .When these services are provided in the same way within 15-minute cities, the need for transportation will be reduced, as services and work can be provided at home. Particularly amid the COVID-19 pandemic, it has facilitated the ability for individuals to engage in remote work and virtual communication.

Technology also encourages new construction methods and the use of alternative energy sources such as solar energy. Thus, it helps reduce the costs of living in cities [20].

From the above, it is clear that digitization is an essential dimension to ensure the success of implementing the other three identified dimensions.

4.1.5 Human scale urban design

One of the most crucial lessons imparted by the COVID-19 pandemic is the imperative to revert to a human scale [21] .This concept advocates the redesign of public spaces with a focus on citizens rather than prioritizing cars. The 15-minute city encourages focused investment in pedestrian paths and Bike lanes so that city residents can meet their everyday needs within a half-hour Cycling or walking[5].

Fig. 7. shows two scenarios where the priority on the left is given to automated vehicles, while the other scenario is designed to favor citizens.

4.1.6 Connectivity

Creating a communication network between neighborhoods via public transportation is instrumental in preventing the isolation of communities from their neighbors, especially marginalized areas. This fosters the ongoing merge neighborhoods into the overall urban structure [22].

Neighborhoods can be linked to each other through 3 different patterns, such as the decentralized network, where there is no single controlling entity, and there are networks that connect the centers of the neighborhoods. and the central network where residents have to travel from one neighborhood to the center to reach another neighborhood. As for the open or distributed network structure, the journey to the center is not long, and it is only a short distance from the neighborhood [23].

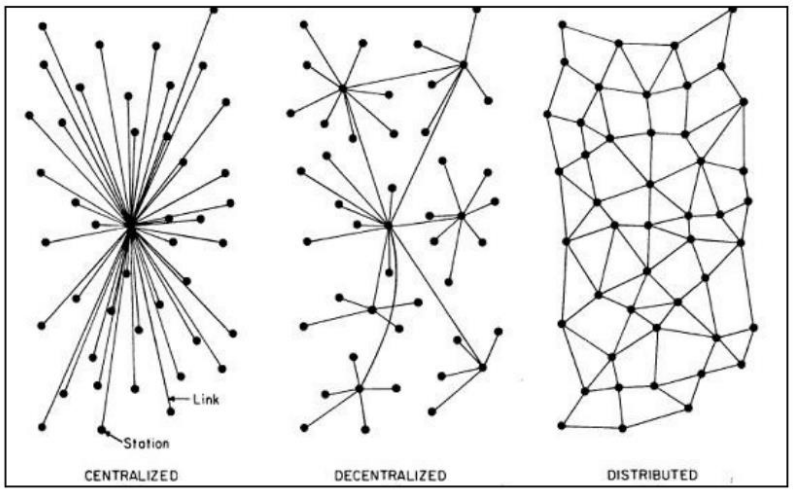

Fig. 8. Types of city network planning: central, decentralized and distributed.

4.1.7 Flexibility

The concept of the 15-minute city underscores the conversion of Public and semi-public spaces with one function into versatile, multi-use areas. This transformation aims to Enhancing building utilization, promoting a more dynamic and flexible urban environment[24] .

Flexibility seeks to allocate diverse roles to public and semi-public spaces that are traditionally utilized for specific purposes at particular times of the day or specific days. An illustrative example is found in Paris, where certain schoolyards transform into public parks outside school hours, serving distinct purposes, especially on weekends [22].

Fig. 9. Principles of the 15-minute city.

4.2 What criteria are considered in determining the size of the area reachable within a 15-minute walk?

The 15-minute city relies on providing safe, comfortable and desirable walking environments. Here there was a need to know how to determine the size of the area that can be reached within 15 minutes on foot. The study relies on two elements:

4.2.1 Determine the size of the area reachable within 15 minutes walk or by bike

According to studies prepared by a group of planners "DPZ CoDESIGN", to determine the size of the area that can be reached within 15 minutes on foot, the following is done:

- Designing an urban area using 15-minute city principles involves drawing a series of concentric circles radiating outward from the heart of the city, each representing a 5-, 10-, and 15-minute walk from that center.
- In these circles, functions are arranged appropriately, always taking into account the specific context.

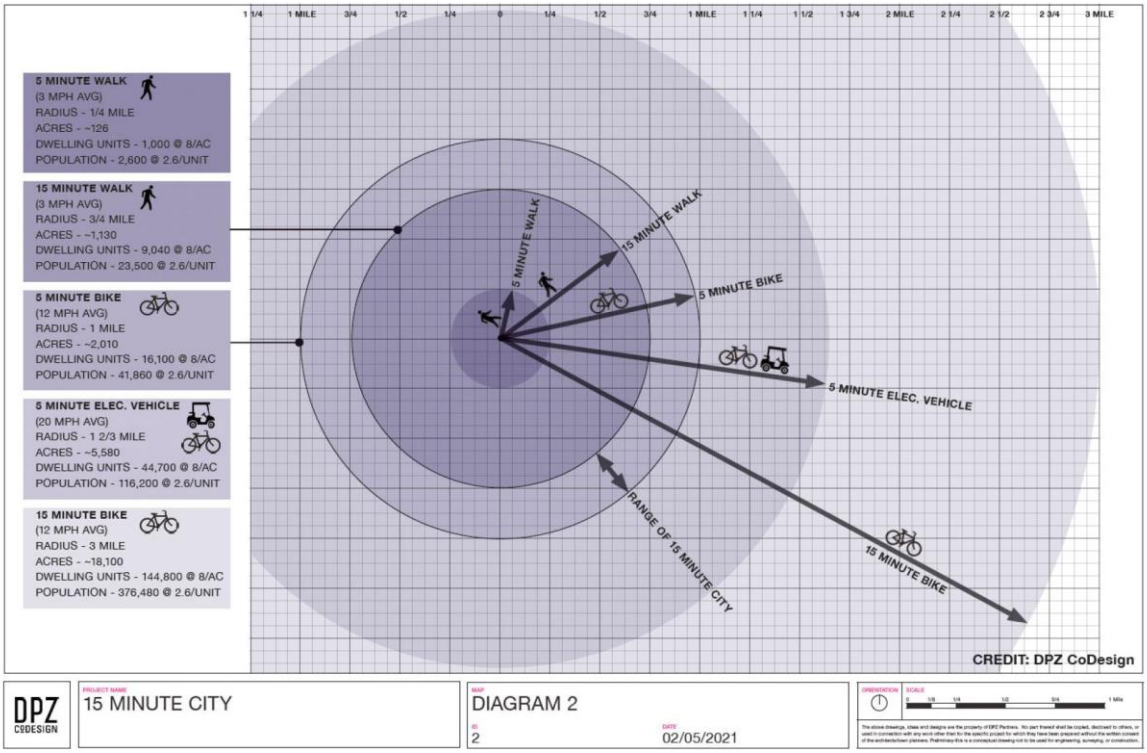

Fig. 10. An infographic explaining the 15-minute city in the role of "walking and cycling" mobility options to enable access to destinations and determine the area served and the number of residents.

4.2.2 Determine the daily needs of residents (children, adults, elderly and families) within 5, 10, and 15 minutes:

The following figure shows the daily needs of the city's residents of different ages. The daily needs are divided into 3 categories: **Fig. 11** shows the daily needs of the city's residents according to their different ages. The daily needs were divided into 4 categories: children, families, adults, and the elderly. Their daily needs differ, but they agree on providing green and public areas, as well as providing shops, public transportation stops, and providing health care centers. **Fig. 12** shows The time of arrival for daily needs varies from one category to another depending on the speed.

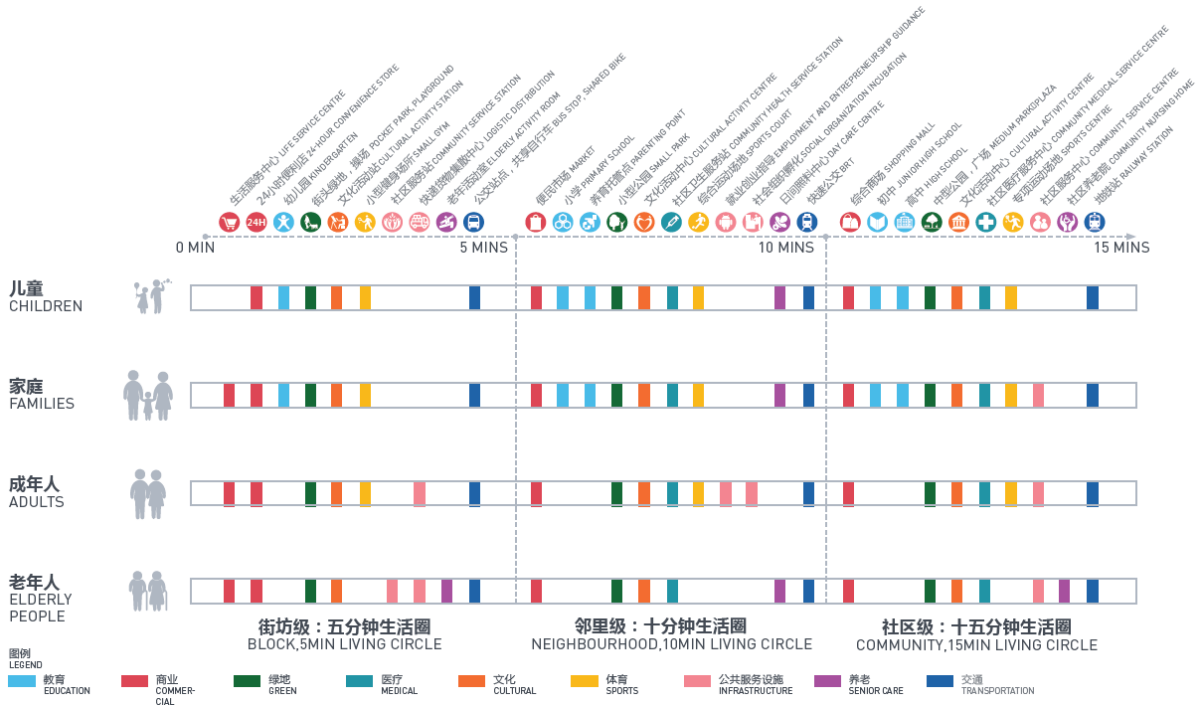

Fig. 11. Daily needs of residents (children, adults, elderly and families) within 5, 10, 15 minutes.

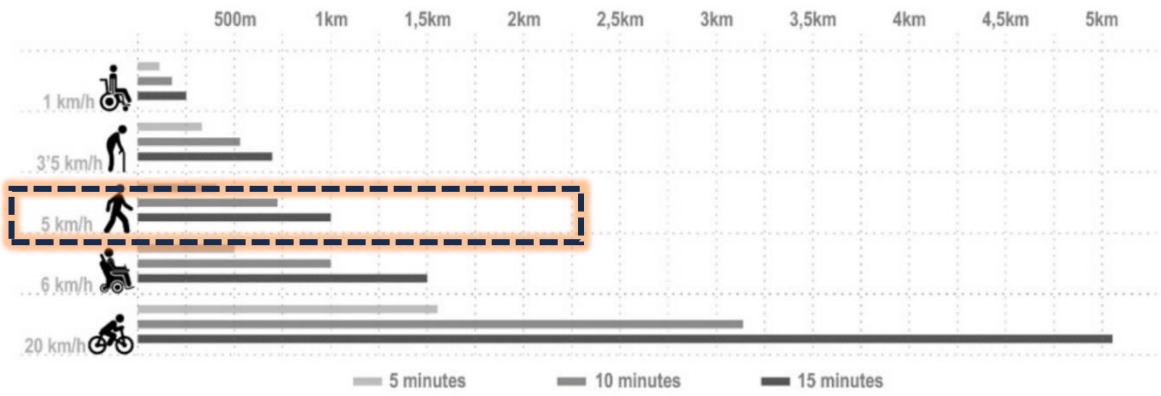

Fig. 12. Average speed and distances reached for groups of users depending on the means of transportation

From the above we conclude that:

- Within a 5-minute walk are jobs, amenities and daily needs of residents, such as grocery stores.
- While within a 10-minute walk, there will be weekly or monthly needs, such as craft stores.
- Within 15 minutes, there is usually a park, schools, health clinics and other community assets, with housing available between here and the centre.
- When a pedestrian moves along the pedestrian path at an average speed of about 4.5 kilometers per hour, he covers a distance of 1,125 meters in 15 minutes on foot. To achieve Professor Moreno's goals, institutions that provide daily needs and functions required by a family must be located within 1,125 meters of each home[25]. When applied to the streets of Paris, it produces a polygon surrounded by a circle with a radius of 1125 meters, meaning an area of 398 hectares.

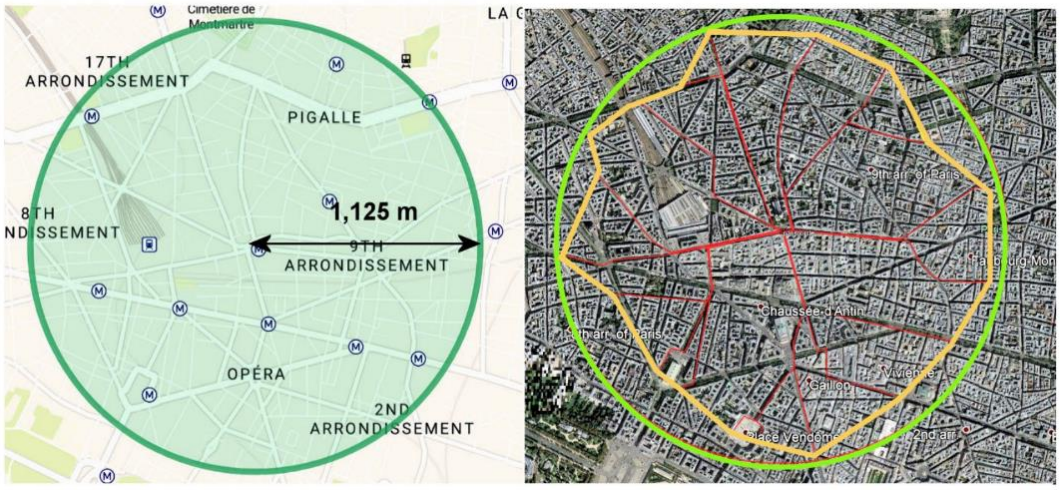

Fig. 13. Walking distance within 15 minutes when applied to the Paris street network.

5. The benefits, challenges, and also criticisms faced by the 15-minute city :

Although the concept of 15-minute cities seems good and ideal in general and has many benefits, like any new idea, it has been subjected to widespread criticism, and in order to implement it, it also faces many challenges. The benefits, challenges, and criticisms that the 15-minute city faces will be discussed in this part.

5.1 The benefits of the 15-minute city to achieve sustainability

5.1.1 Improve health and quality of life

Reducing travel time between places, giving residents more free time at their disposal. In addition to the physical and psychological health benefits resulting from reducing carbon emissions, which provide clean air and high-quality green spaces, ease of choosing healthy eating habits, and forming stronger community relationships that reduce feelings of loneliness[15].

Fig. 14. Amsterdam Street in the 1970s compared to now “Note the cycling on the sidewalk in the photo on the left. On the right, notice the wider sidewalks and no biking on the sidewalk because there are bike paths”.

5.1.2 A more environmentally sustainable city

The 15-minute city relies mainly on walking or riding bicycles instead of cars, which reduces pressure on the environment and reduces emissions resulting from cars. The presence of more trees, plants, and green spaces also reduces the impact of temperatures, reduces the risk of floods, and improves Biodiversity.

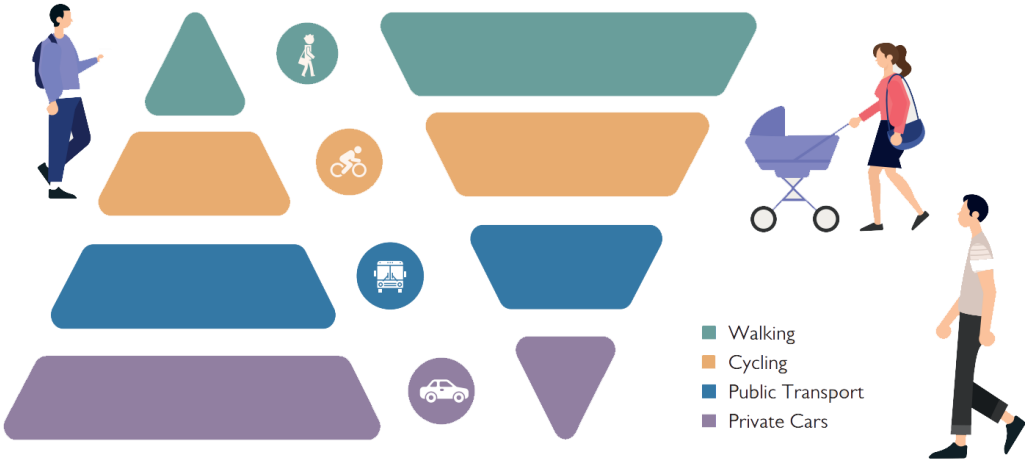

Fig. 15. The 15-minute city relies on walking and cycling instead of relying on cars in the past.

5.1.3 A more just and inclusive city

The 15-minute city provides more public spaces, both indoor and outdoor, in which one can play, mix and socialize. It also supports companies and entrepreneurs. Streets and active transportation programs are designed for users who cannot afford a car. It also provides incentives for citizens to participate in local policy-making, which strengthens the individual's sense of community [24].

5.1.4 Boost the local economy

Greater footfall on local high streets generates more local and diverse employment opportunities as a result of more productive use of buildings and streets. Former Oklahoma City Mayor (2005-2018), Mick Cornett, spoke about how people-focused street investments helped improve the city's economic fortunes and address the obesity problem, producing results in just five years .

From the above, the researcher believes that: The benefits of the 15-minute city are countless. Giving priority to walking and cycling, as well as providing access to green spaces such as parks and children’s play areas, greatly supports public health, encourages a sense of belonging to the community, encourages interaction and integration with residents, and helps combat isolation. The establishment of shops and amenities also provides a welcome boost to the local economy and encourages walking or cycling rather than using cars, which is better for the environment and the physical health of residents.

Fig. 16. The health, social, economic and environmental benefits of the 15-minute city. Infographic from the State Government of Victoria, Australia.

5.2 Criticisms faced by the 15-minute city

The "15-minute city concept" is an urban planning concept that aims to create cities where residents can access most of their daily needs, such as work, schools, grocery stores, and recreational activities, within a 15-minute on foot or bicycle from their homes, reducing congestion and pollution. While improving the general quality of life for the city's residents, it faced many criticisms, and anger over the concept of the 15-minute Internet city spreaded to protests in several cities.

- From a climate scientist's point of view: Pre-existing climate skeptics began spreading the misconception that COVID-19 was just a prelude to a broader conspiracy to control people and force them to stay at home, especially after the idea of a "climate lockdown" began to grow online in September 2020. Local activists pointed to a December 2022 tweet by Canadian psychologist Jordan Peterson, an influential voice among the far right, attacking 15-minute cities for harboring conspiracy theories linked to the campaign in a post that has since achieved 7.5 million views.

Fig. 17. A tweet on X (formerly Twitter) by psychologist Jordan Peterson.

Moreno said in a recent interview on the issue “Their lies are enormous given that UN-Habitat, the World Economic Forum, the C40 Global Climate Network, and the United Local Government Association, among others, have supported the [15-minute city] concept,”. It feeds their fantasy that I am involved in the 'invisible leadership' of the world [26].

From the residents' point of view: Social media platforms were the reason for the popularity of the 15-minute city, as it sparked controversy among residents. In December 2022, a lot of anger focused, and hundreds of people took to the streets of Oxford carrying signs such as “No to the 15-minute city” in protest against Oxford City Council’s plan to reduce traffic on some public roads and grant local residents permits for a specific number of car trips on these roads. Residents believe that “15-minute cities” are designed to restrict people’s movements, increase government surveillance, and violate other individual rights. This is what one Instagram user said in a recent video that has been liked more than 5,400 times. “You will not be able to use your car on some roads and highways without permission and approval from the government. You will be constantly monitored by surveillance cameras to ensure that you do not leave your designated residential area without obtaining permission.” One British TikTok user says the authorities are planning to "divide towns, cities, etc... and you will have to apply for a permit to leave your area."

- The 15-Minute City idea even made it to the UK Parliament, with one MP describing it as an “international socialist concept” that “will cost us our freedom”.

Fig. 18. Protesters demonstrate against 15 Minute Cities on February 18 in Oxford, England. Photographer: Martin Pope/Getty Images Europe.

In general, concerns about government tyranny, loss of personal freedom, and conspiracy theories have led to negative reactions to the 15-minute city concept. However, it is important to address these concerns while also recognizing the significant benefits this concept can bring to communities, including improved accessibility, sustainability, and social interaction.

5.3 Challenges facing the 15-minute city

- **Implementation challenges:** To implement the 15-minute city concept, urban planners must consult with stakeholders and communities to consider several factors, such as land availability, topography, existing infrastructure, and population density. Converting existing cities into 15-minute cities can be a logistical challenge. This may require major changes in infrastructure and transportation systems, and will therefore be difficult to implement, of course, due to the different uses of land and infrastructure. However, if the goal is to create a 15-minute city from scratch, the financing and construction amounts will be very expensive. In that case, a comprehensive study must be done about what the city will provide to the economy in the future.
- **Viability in congested cities:** Implementing the concept can be difficult in congested cities like Melbourne, which suffer from congestion and car dependency and are known for their expansive urban structures and strict land use regulations and zoning bylaws [27].
- **Economic Concerns:** There are doubts about how the 15-Minute City will achieve objectives such as affordable accommodation, racial diversity, and proximity to work

housing. Similar criticisms have been raised in previous planning movements, suggesting a need for greater clarity on how to achieve these goals in practice.

- **Equity issues:** Critics worry that the benefits of 15-minute cities may not be equally distributed, such as the large inequalities in resource allocation and access to high-quality facilities and services in our modern cities. This is because land planning systems have supported the segregation and differentiation of jobs and supported centralization in our cities. Which could exacerbate social and economic disparities if certain communities receive more attention and investment than others [28].
- **Economic Viability:** There are concerns about the economic viability of businesses in central and less central areas as people mainly frequent nearby establishments - supporting more work from home - which negatively impacts central business districts (CBD) and less central areas that thrive in the ecosystem of people coming to work By public transportation, which may affect the diversity of businesses.
- **Suburban areas:** The 15-minute city is difficult to implement in suburban areas, as suburban centers pose a formal challenge due to their non-urban form. Especially, suburban areas consisting of single-family residences are considered less ideal for implementing the 15-minute city model, as the population is spread over a larger area. In the 15-minute city, the issue of population density is of great importance for savings services, onset from daily facilities to infrastructure to public transportation, which is difficult to provide in the suburbs [29].
- **Confusion about the planning level:** The name of the concept suggests a city-level planning approach, but its focus and characteristics are often at the neighborhood level, creating ambiguity regarding the appropriate scale of implementation [23].

Briefly, the 15-minute city concept, although attractive in its vision of a more sustainable and accessible urban life, faces various challenges and criticisms when it comes to practical implementation in diverse urban contexts. These barriers highlight the need for a careful and adaptable approach to urban planning and design.

Conclusions

The 15-minute city is considered a recent development in city design, as it focuses on providing ease of access and movement for residents within its borders in a short time not exceeding 15 minutes. There is much more to the 15-minute city than how we move around. Viewed holistically, they provide us with useful tools for balancing the global challenges of climate change, economic instability or health, and balancing those challenges with the needs and aspirations of local communities.

If there is one lesson to be learned from the Covid-19 pandemic, it is the benefits of flexibility. In just a few months, we have turned our homes into workplaces, restaurants into food pantries, parks into hospitals, hotels into quarantine spaces, and laptops into schools. And certainly, in the coming years, we can figure out how we can reorganize our cities in ways we didn't know existed. This is basically what the idea of the 15-minute city refers to. Cities are flexible spaces that we can replan when the need arises.

According to Morono's definition, the 15-minute city is composed of four basic dimensions: the illusion of proximity, density, diversity, and digitalization. Some planners added three complementary dimensions to complete the principles of the 15-minute city: designing the city on a human scale, flexibility, and communication. Through these elements, 15-minute cities provide an effective and sustainable environment for residents and achieve quality of life.

Although the concept of 15-minute cities is considered an important development in city design, it faces some criticism and challenges. Anger over the 15-minute city concept has spread from the Internet to protests in several cities for fear of government tyranny, loss of personal freedom, and conspiracy theories. Some residents say the design of "15-minute cities" restricts people's movements, increases government surveillance, and violates other individual rights.

Until now, 15-minute cities have shown some positive results in many cities around the world. Studies and experiments indicate some benefits and positive effects achieved by this idea, such as improving the quality of life and encouraging residents to use sustainable transportation, which reduces traffic congestion and carbon emissions, and also improving the general health of the population by encouraging people to walk and ride bicycles. This can contribute to improving physical fitness. However, challenges must be taken into account and sustainable solutions must be considered to move forward towards effectively achieving the goals of 15-minute cities.

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