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Review Article

Post-COVID-19 Era, 15th Minutes City New Urban Model Changing Housing Design and Models

Hülya Coskun*

MSGSU, Mimar Sinan Fine Arts University, Faculty of Architecture, Istanbul, Turkey

https://orcid.org/0000-0001-7123-622X

More Information

***Address for correspondence:** Hülya Coskun, MSGSU, Mimar Sinan Fine Arts University, Faculty of Architecture, Istanbul, Turkey,
Email: her_222@yahoo.com

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Abstract

This research centered on the transition from sustainability to the post-COVID-19 era, significantly altered and transformed cities, city plans, and housing models holistically approach. Although the academic world concentrating on sustainable urban and housing design since the 1990s, the pandemic has emerged as a critical paradigm shift in context since 2019. During the COVID-19 period the Paris city 15 minutes concept, first introduced by Paris Mayor A. Hidalgo initially sparked controversy as temporary now considered permanent in Paris recently, Oxford. In the post-pandemic era, sustainability has become significant on the global agenda, shaping cities, city models, and residences through profound and radical changes. Some efforts are supported by Climate-change conferences in the world and subsequently some determinations like the Paris Agreement and UN declarations that guide more livable environments and houses. Due to COVID-19 the newly emerged conditions and compulsory changes that have taken place in the cities the social isolation, distance living, and remote working led to radical changes in the living style, environment, city plans, housing models, and typologies holistically. Although many publications have been published in the last few years about the pandemic and the Paris City 15 minutes concept, they only address the city and urban scale solutions. There is no research with a holistic approach that relates the subject from the urban scale to the architectural scale, housing, and blocks. Within the 15-minute concept, searched, developed, innovative, and sustainable urban and housing-oriented suggestions for cities in the future are presented at the end of the research. In conclusion, it is revealed that the issue of sustainability has gained importance with an increasing momentum in the world agenda, witnessed the radical changes in cities and residences, in the post-COVID-19 period in the last 2-3 years.

Introduction

The objective of this study is to provide a fresh perspective on the post-pandemic era and its enduring impacts on evolving lifestyles and housing models, especially in recent years due to COVID-19. The research is specifically focused on the period after the pandemic, which has significantly altered urban structures, city dynamics, plans, housing designs, and models. Following the pandemic, the world transitioned into a new phase and faced unforeseen challenges. Initially, these changes were underestimated and perceived as temporary; however, urban and housing planning adjustments have become permanent. Presently, there is ongoing discussion about whether the mystery of COVID-19 marks just the beginning of future challenges [1]. Thus, concerns about the pandemic come up on the agenda, with different scenarios and it seems that the issue once thought to be temporary, will remain to have a permanent place in our lives in the long term in the future [2].

This research concentrates on the shift to the new era after COVID-19, which has significantly altered living and urban environment, cities, city plans, and models, as well as the housing models. While the whole world has been focusing on sustainable urban and housing planning since the 1990s, the pandemic has become a new unforeseen turning point in this regard since 2019. Indeed, the unexpected impact of ordinary epidemic disease on society, living styles, and urban environment, and changing housing demands models and typologies has been a significant development. This study sheds light on the global focus on the pandemic and its effects, exploring how cities and living styles have evolved in response. By delving into this unexplored subject, this research is poised to make a significant contribution to the existing literature.

Paris's 15-minute city concept garnered significant attention during the pandemic period, capturing curiosity and echoing in the world. The plan proposal, focusing on localized living and amenities within a 15-minute radius, created a ring in urban planning discussions. (Figure 4b) Remarkably, London adopted this model shortly after Paris,

marking a swift response to the changing urban landscape amid the pandemic's challenges. This rapid implementation showcased the adaptability of cities in the face of unforeseen circumstances. The prompt adoption and subsequent consideration of the 15-minute city model indicate a shift in urban planning paradigms. (Figures 2a-c) Originally proposed as a temporary solution in response to the pandemic, its potential for long-term implementation has become apparent. This model not only addresses immediate challenges posed by COVID-19 but also offers sustainable solutions for future urban development. Researching the underlying principles, implementation strategies, and adaptability of this model to diverse cities would indeed provide valuable insights for urban planners and policymakers worldwide.

Paris City's 15-minute concept, first implemented by Paris Mayor A. Hidalgo, indeed, stands as a notable and forward-thinking approach to urban planning. The concept, initially controversial, has emerged as a viable solution for future urban planning challenges in cities like Paris and London. This model's adaptability and latent to enhance urban living while promoting sustainability have positioned it at the forefront of discussions about the future of city planning. The pandemic has not only highlighted the urgency of sustainable urban development but has also catalyzed innovative solutions that can shape the cities of the future. The most ambitious plan was a 15-minute city of Paris was put into effect by the Mayor of Paris, A. Hidalgo, and new city models and zoning regulations related to COVID-19 and Sustainability [3]. The city was transformed from a car-centered suburban in the 20th century to be centered in the immediate vicinity of facilities and houses with the COVID-19 restrictions. The French concept of *hyper-proximité* (hyper-proximity) explains the gathered facilities according to daily human activities in the vicinity which is considered the world's most ambitious community plan. The plan challenges this old orthodox old zoning model of the 20th century that divided the city into separate specifically determined areas; for residential, retail, entertainment, manufacturing, and office districts [4]. Indeed, the 15-minute city concept emerged as a novel approach to meet people's essential needs within a limited geographic area, ensuring minimal contact with others for health and well-being. Paris, with its radial plan influenced by the early 20th century Henri Prost zoning plan (Figure 4a) and enclosed with Baron Eugène Haussmann's blocks, (Figure 3c) showcased the adaptability of this concept. However, examining the adaptation challenges in Paris and potential issues in other global cities is crucial. This model's ability to reshape urban living and enhance community resilience hinges on addressing these challenges effectively. The 15-minute city concept, while promising, requires thoughtful implementation and adjustments to suit diverse urban contexts.

The cities with a population exceeded over 10 million like London, Beijing, Tokyo, Istanbul, etc. [5]. Unpredictably COVID-19 has been a turning point in awareness of health issues, as well as the other problems. The world cities, struggling with problems in years such as migration, population, or uncontrolled urban expansion, faced new unknown problems with COVID-19 like a new living environment. Traditional urban and housing models were forced to evolve rapidly. Initially considered temporary, the measures implemented in cities and housing have become permanent solutions. Innovative initiatives, like the 15-minute city concept pioneered by the Mayor of Paris, have transformed into global urban design phenomena adopted and implemented by other cities. These new 15-minute regulations recently have been put into effect as a new urban planning strategy in London, Oxford which residents it is the year 2049, UK City of Oxford, are unable to leave their neighborhoods also creates some paranoia [6].

COVID-19 made us think once again about how important also sustainability is. It has emphasized that investing in sustainable cities, and adaptable living spaces, and the countries, including Italy, Spain, Netherlands, and India, put into efforts new legislations related to city and housing planning [7,8]. While constant depopulation has been observed in some American and European cities experienced a significant decrease in the working system [9]. The initial restrictions of the pandemic that may have seemed to limit globally also paved the way for more innovative and sustainable approaches to urban living.

Indeed, COVID-19 has served as a catalyst for cities such as Paris and London, among many others, to rethink their approaches to urban planning and housing design during the pandemic and prioritize sustainability, health, and resilience in their projects. Many countries in the world, such as Italy, Spain, and the Netherlands, realized the challenges posed by the epidemic and seized the opportunity to redesign their cities, city plans, and housing models. These changes have necessitated adaptations in cities' housing and office planning and models that reflect the evolving needs and preferences of individuals and communities. Regarding the issue of reconsidering organizing a city plan, and adapting to new pandemic circumstances it can be said that the most radical plan proposal emerged in the 15-minute Paris plan. (Figure 4b) This city model aimed to examine its historical background and the transition from the old historical city model to the 15-minute Paris city model during the pandemic period. This plan's functionality, suitability, and adaptability of this model for the medieval city of Paris and other cities were investigated (Figure 3c) Also, to create a healthy living zone which was also arranged a *zone* (zoning plan) by Henri Prost in the early 20th century (Figure 4a) during the pandemic period. Thus, in the model created for Paris, only functional divisions or zoning within the city is seen as a significant design approach in epidemic disease. Furthermore, different from the other research with a holistic approach, this 15-minute city model has been explored from the urban scale-

Figure 1: From Sustainable City towards to Post-Pandemic Era 15 Minutes City Concept.

Figure 2: a) New York, Photo; b) The Real Deal. (Mid), c) 15 Minutes City Concept, Photo, depositphotos. (Below), Bicycle ways, Photo, intertraffic.com.

neighborhood to the architectural-scale-like; housing and block, and building-block scale: how individual housing block can be designed.

Urban-scale

Neighborhood, investigating how neighborhoods can be designed or adapted to support the principles of the 15-minute city, including mixed-use developments, green spaces, and efficient transportation networks. Also, starting in Paris, quite radical new city models emerged, such as the 15-minute city concept (Figure 1), which created a healthy livable environment that made it possible during the epidemic, in which the city's working, shopping, current daily needs and living spaces are solved and planned very closely.

Architectural-scale

Exploring how individual housing units, blocks, and building blocks are considered in the Paris city model and how can be designed to contribute to the overall goals of the 15-minute city, such as incorporating sustainable materials, energy efficiency, and flexible spaces that can adapt to various needs. Whether the city was surrounded by Haussmann-style old building blocks and the blocks needed to evolve into a newer and developed sustainable, garden-city-block-model, inspired and developed from Cerda's blocks in Barcelona plan as innovative sustainable model holistically.

Finally, in addition, with a more holistic approach, houses, blocks, and building blocks suitable for this model, from urban scale to architectural scale, were also presented as suggestions at the end of the research. It is also questioned in the research this city models may take their inspiration from past models. (Figure 3a-c) Ultimately, the crisis spurred positive changes by encouraging nations to adapt and create more resilient, healthier, and sustainable urban environments.

(Figure 2a-c) Moreover, humanity needs to be prepared for even more serious challenges in the future [10]. The world has encountered new urban planning dynamics with the problem of livable cities and the environment, human well-being, the pandemic, sustainability, and resilience.

The methodology

The methodology used in this study focuses on examining the problems of cities during and after the epidemic. The measures and solutions implemented in cities led to the creation of an example such as the Paris 15 Minutes city model, which provides the conditions of the pandemic period.

Although many publications have been published in the last few years about the Paris City 15 minutes concept, they only address the issue at the city and urban scale. There is no research with a holistic approach that relates the subject in a broader context, from the urban scale to the architectural scale, from the city to housing and housing blocks. Ultimately, this is seen as a research gap. According to the methodology, the subject examined through the Paris 25 Minutes concept case study;

1. This model has been examined in terms of its historical background and the transition from the old historical city model to the 15-minute Paris city model during the pandemic period. The functionality, and adaptability of this model in the medieval city of Paris and other cities investigated.

2. With a holistic approach, this 15-minute city model has been explored from

- Urban-scale-neighborhood to investigate how neighborhoods, housing, and blocks can be designed or adapted to support the principles of the 15-minute city, including mixed-use developments, green spaces, and efficient transportation networks.

- Architectural-scale-like; housing, block, and building-block scale: how individual housing block can be designed. In addition, with a more holistic approach, houses, blocks, and building blocks suitable for this model, from urban scale to architectural scale, were also presented as suggestions at the end of the research.

With COVID-19 directly threatening human life in a destructive manner, the reality of the disease urging people to take precautions both in cities and in their houses. While sustainability efforts have been ongoing for many years, the threat posed by COVID-19 to human health accelerated the acceptance of necessary changes. Consequently, the measures related to sustainability and resilience, which have been under development since the 1990s, were implemented in a relatively short period, particularly in the last 2-3 years during the pandemic.

The COVID-19 a new proposal for A. Hidalgo's 15 minutes city in Paris

Since the beginning of the 20th century, cities have been developed according to certain outdated urbanistic norms. The COVID-19 pandemic has forced people to confront a new reality that conflicts with the old, rigid metropolitan model. During the pandemic, a new city model was needed that divided the cities into functions and ensured that people could reach everywhere in the city in a short time. Indeed, one of the old city models the *zone* plan (zoning planning) as the hundred-year-old idea was developed by the first generation of French-originated architect-urbanists, pioneered by Henri Prost which involved separating the city's functions and differentiating between residential, and commercial, entertainment, and industrial areas. This model, to some extent, overlapped with the city concept wanted to develop during the pandemic as well as the sustainability that has been developed until now.

There have been various reactions to the virus; some European countries have managed COVID-19 better than others. Europe, for the most part, temporized, but some European countries took swift action [11]. With newly developed suggestions and ongoing discussions, Europe came to the forefront in terms of implementing new practices. One significant initiative was the 15-minute city concept, which was intended to be implemented in Paris and is now being considered by countries such as the UK in London during the post-pandemic period.

Although it was thought that initially limited to the urban life of people in Paris, after COVID-19, it comes to the fore as a new application that is sustainable and wanted to be implemented in cities in the future. The 15-minute city idea which was previously seen as a simple suggestion for the pandemic, is indeed applicable not only within the scope of the pandemic but also in the future cities' sustainability. It could also be applied especially in the context of sustainable cities; It turns out that a business and residential environment, reachable within 15 minutes on foot or by bike, also offers CO-free, cleaner air, and healthier urban life. (Figures 4b-d) The approach revealed that it is important for COVID-19, to provide a sustainable and healthy life for cities in the future. In Europe, the changing working conditions and requirements to work from home or vicinity from home have become a focal point of discussion. The 15-minute city system, as implemented in cities like Paris, offers employees the opportunity to work in nearby areas, allowing them to reach their homes within minutes. During the pandemic, people were forced to stay at home for extended and, at times, unknown periods. This situation has underscored the growing realization of the need for more comfortable, car-free, and healthy living options. The significance of living and working areas in precise locations, coupled with easy access within the city, has become increasingly apparent [4].

As a response to the COVID-19 pandemic, measures such as general lockdowns and promoting distance living have led to the implementation of new urban planning ideas such as the 15-minute city, which has been urgently put into effect in Paris under the leadership of Mayor Ann Hidalgo [3]. (Figure 4b) The first debates and discussions started just after COVİD-19 on Paris city planning and adapting the city to the pandemic and post-pandemic era. The concept explained by Paris Mayor Ann Hidalgo and Carlos Moreno Scientific Director of The Sorbonne University, IAE, Paris; As a challenging innovative concept that would make the capital city Paris 15 city "*la ville des proximités*" (the city of proximity) which the idea create neighborhood each residents need easily within 15 minutes by bike or walk [12]. Indeed, first, it was declared by Ann Hidalgo Paris Mayor that "Paris needs to become a "15-minute city" announced as an urban manifesto by Mayor Anne Hidalgo, who is pursuing the electoral process. It would be implemented as a radical effective plan with the pandemic, the city's urban transport system which has already barred polluting vehicles and cars from the River Seine quayside replacing trees and pedestrian paths. This would be planned in the context of Paris's old city remodel the residents can have all their needs for work, shopping, health, or culture—within 15 minutes of their own doorstep [4].

Mayor A. Hidalgo's adviser Carlos Moreno later explained the main principles of designing a 15 Minute City concept, Liberation a French journal; there are six things that make an urbanite happy, also specified the keywords of the 15 Minutes City Formula.

- Dwelling in dignity,
- Working in proper conditions, [being able to gain] provisions,
- The well-being,
- The education.
- The leisure and to improve quality of life, you need to reduce the access radius for these functions.

All that commitment to bringing all life's essentials to each neighborhood means creating a more thoroughly integrated urban fabric, where stores mix with homes, bars mix with health centers, and schools with office buildings.

Envisioned as an old, 20th-century car-centric suburban-style zoning further intensified this separation, leading to an era of consolidated schools, big-box retail strips, and massive industrial and office parks, all isolated from each other and serviced by networks of roads and parking infrastructure, the concept of *hyper proximité* (hyper proximity) as the French call it, and it's driving many of the world's most ambitious community planning projects [4].

The analysis of the 15 minutes city concept originated from a middle-age model

Indeed, it is anticipated that Paris's, orthogonal (circular) *Viry la Françoise*, or *radioconcentrique* like *ville franche sur Mise* and Mannheim's old, urban form [13]. Like old European cities; Paris, Rome, etc. However, when these two typical circular models are examined, especially when Palmanova and Mannheim are compared, although they are circular urban formulas, differences are observed in the urban setting; While Palmanova manifests radial expansions, Mannheim had an ancient grid plan within the circular plan schema (Figures 3a,b).

Although the Haussmann period radial plan of Paris was planned entirely for security purposes [14], it is observed that it has a structural setup that aligns well with the 15-minute city concept (Figure 4b).

This arrangement could be a viable solution for organizing the city's old, densely populated historical center, which has housed more than 2 million residents over the years.

However, a significant challenge lies in adapting this model to different urban forms and developing a 15-minute scheme plan. Paris has a unique circular urban layout that suits the 15-minute concept exceptionally well. This approach can be seen as a rhetorical return to the industrial period's planning, contrasting with the car-dependent city concept of the 20th century promoted by modern planners like Le Corbusier [15]. Le Corbusier does not approach the "contemporary city" positively, which is an indicator of developing modern urbanism, and the Athens Declaration is also against the *ville idèale* (ideal city) and the traditional city by dividing cities into functions and into regions [16].

Coincidentally, the first applications of CIAM also aligned with COVID-19 measures, focusing on the regulation of cities in the context of public health. In the 1960s, CIAM approved rules addressing "public health" concerns, emphasizing the need to tackle the challenges posed by population growth and transportation within the framework of sanitation regulations. The proposed solution involved planning cities with multi-story buildings to optimize space utilization within a regular geometric system [17]. According to the rules of CIAM (International Congress of Modern Architecture), the modern city of the 20th century depends on a single structural system. This practice ensures the "public health" and "modernization" of the city.

In the context of sustainability, there has been a growing trend in urban planning towards reducing reliance on cars. This model aims to create a city plan where both business and residential areas are designed to be accessible within 15 minutes on foot or by bike (Figures 4b-d), eliminating the need for cars. This approach not only promotes CO-free cleaner air and a healthier urban environment but also aligns

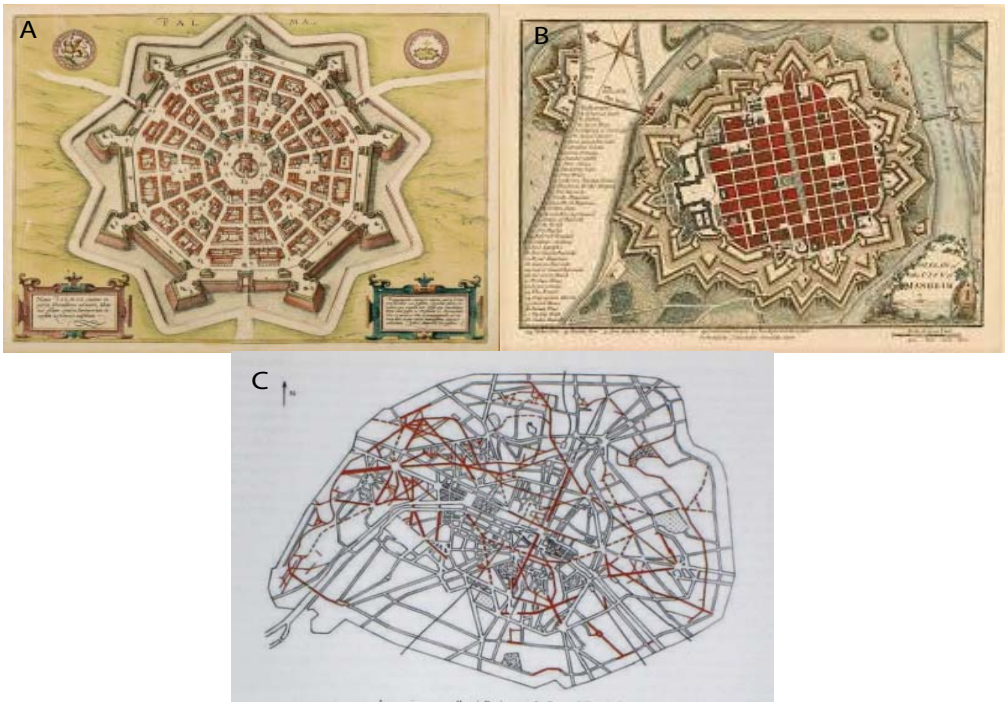

Figure 3: a) Scamozzi's Radial plan scheme (like Paris), Palmanova, Merlin, p. 13. (Left), b) Mannheim, circular scheme, inner grid plan, Lavedan-Hugueney-Henriat, Merlin, p.16. (Right). c) Paris, Haussmannien Radial Plan, Plan: Une Brave Histoire d'Aménagement Paris p. 21.

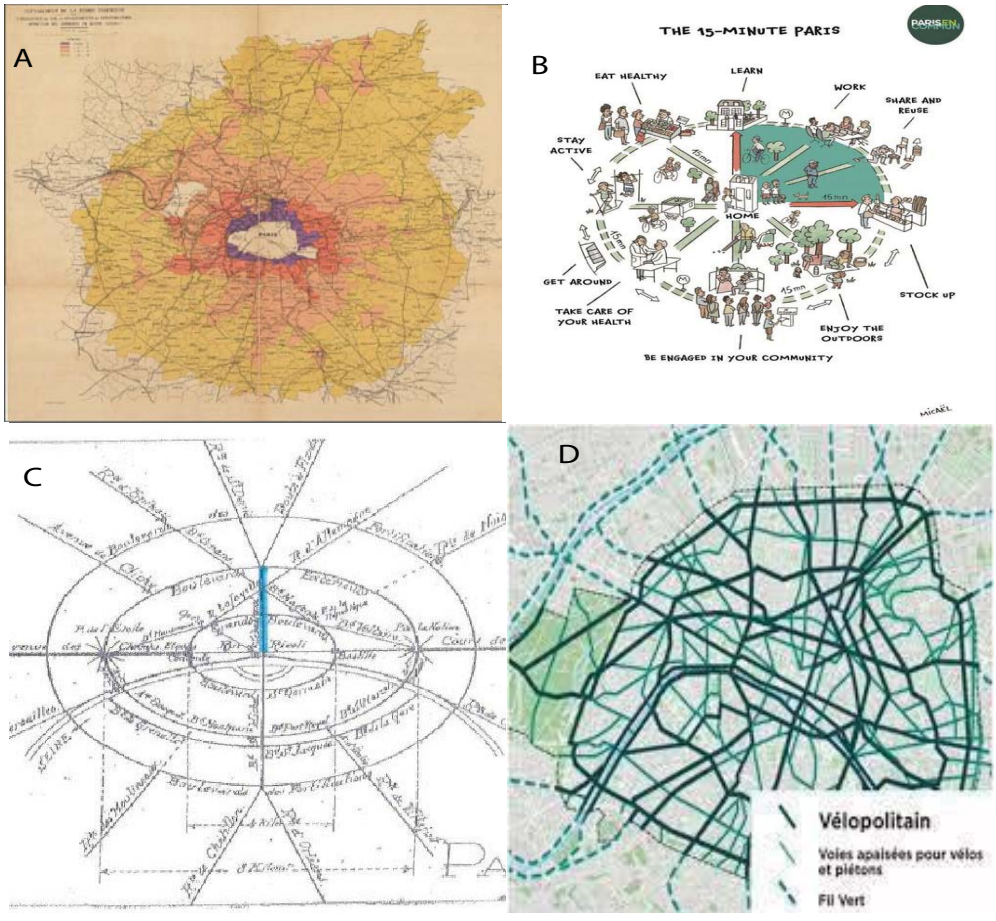

Figure 4: Paris City Transformation from the early 20th Century's Zoning City to the Paris Mayor Ann Hidalgo's Walkable City. a) Plan, Henri Prost Zoning Plan, IFA Archives, Paris. (Left); b) Ann Hidalgo's Paris Plan, Map, https://www.treehugger.com/the-15-minute-city (Right); c) Transformation E. Henard's Metropolitan Plan to the Velopolitain, E. Henard's Paris Plan Source: Norma Evenson, 1979 and Katleen Cecile Lord, 2016, (Left); d) Paris Velopolitain city, https://www.leparisien.fr/info-paris, (Right).

with the sustainable city models that have become prevalent since the 1980s, diverging from the modern urban planning norms of the mid-20th century. This idea not only addresses the challenges posed by COVID-19 but also holds the potential to foster a sustainable and healthy urban life in the future.

While efforts to promote sustainability have been ongoing for many years, the pandemic has forced rapid changes and increased attention to issues such as green spaces, walkability, and the search for alternative modes of transportation systems. The COVID-19 pandemic has accelerated transformation the of sustainability and resiliency in cities, as the threat to human health and the disruption of urban life emphasized the importance of creating more livable and sustainable environments.

Paris 15 minutes city concept and transformation of old, Henri Prost's zoning model to the A. Hidalgo's 15 minutes city model

Indeed, even in a dense city like Paris, which has more than 21,000 residents per square mile, the concept as laid out by the Hidalgo campaign group *Paris en Commun* (around Paris city) required that a challenging plan and implementation considering the city scale project, it would require a sort of anti-zoning—implementations (on the contrary First generation French urbanists method), even explained as "deconstructing the city" according to A. Hidalgo adviser professor Carlos Moreno from Paris-Sorbonne University. It is based on the basic urban life in modern cities and the new city model aims to meet the simple needs in the shortest way. So, the municipality of Paris has replaced this old "metropolitan" archetypal to an accessible within 15 minutes city model through short walks or bike rides, parks, and schools and cafes gathered within a quarter which made public transportation [18] (Figures 4b-d).

Paris city model developed, on the contrary, a well-known old metropolitan archetype since the beginning of the 20th century. The 15-minute city concept aims to mix as many uses as possible within the same space, challenging the planning orthodoxy of separating "residential areas" and "working areas", retail, entertainment, manufacturing, and office districts (based on old zoning plans of French architect-urbanists particularly developed by Henri Prost in the early 20th century) [19]. (Figure 4b) Almost more than a century, in Europe, Paris, Nice, Istanbul, and in N. Africa, Morocco, Rabat, Algeria, etc. The cities were planned according to Henri Prost's well-known *zones* (zoning) urban planning model of the early 20th century [20]. Although this geographical division of uses may have made sense at the dawn of the industrial era, when polluting factories posed health hazards, it no longer aligns with the current need for sustainable and livable cities [21].

Before A. Hidalgo's new plan and previous implementation, such as barring polluting vehicles and cars the River Seine quayside replacing trees and pedestrian paths had already been implemented since the early 20th century. Furthermore, new buildings within the Paris city *péripherie* (periphery) were already long before prohibited. It was deemed appropriate to plan the new houses to be built new *cité-jardins* (garden-city) out of the city walls and it was envisaged that the city would grow with garden-cities towards the outside in the future, while the city center was now crowded buildings.

With the changing working conditions on the agenda, the 15-minute system in a city like Paris is in favor of offering employees the opportunity to work in a close area where they can reach their homes within minutes. During the pandemic, people were forced to stay at home for extended and even unknown periods, there is a growing realization that more comfortable, car-free, and healthy living options were needed. The employees, living and working areas in accurate surroundings are significant along with access.

The 15 minutes city model planning blocks by blocks

The urban planner Ildefons Cerdà's modern city as planned in blocks in Barcelona [17] could serve as a precedent for car removed version of modern-day 15 Minutes Paris, which was originally designed with planned with Baron Eugénie Haussmann's blocks more than a century ago. The pandemic inspired-proposal envisions a city and housing planning approach where transportation between blocks occurs through walking, cycling, or, at most, short 10-15 minute subway rides within close vicinity. It is believed that Mayor A. Hidalgo's model was inspired by two key influences: firstly, the admired "superblocks" in Cerdà's modern Barcelona, which, by eliminating cars, promote living within car-free multi-block zones planned by walking, cycling, or at least short distance 10–15-minute subway rides vicinity [4].

The Paris city inner *péripherie* (periphery) was planned in the previous centuries by Baron E. Haussmann which was dependent on the old pre-industrial Haussmannien era [19] (Figure 3c). Haussmann worked to address the physical problems of the city through the liberal policies of the period and prioritized "public health" [22]. Haussmann's method aims to provide solutions to the visible problems in the industrial city of Paris. Today, Paris predominantly consists of blocks planned by E. Haussmann for the *Parisien bourgeoisie* class, while the less privileged had to repurchase their houses [23]. Construction of new buildings was prohibited within the city's *périphérie* (periphery) or inside the Paris city walls from the early 20th century onwards. Subsequently, the decision was made to modernize the city through the Social Museum project led by E. Hénard [24]. The plan involved dividing the city into specific *zones* (zoning) and implementing new park projects [25] (Figure 4a).

Indeed, some of Mayor A. Hidalgo's plans should be viewed as a continuation of the city's policies that have persisted for almost a century since the early 20th century with H. Prost's plan (Figure 5a). The foundation of the Mayor's pandemic

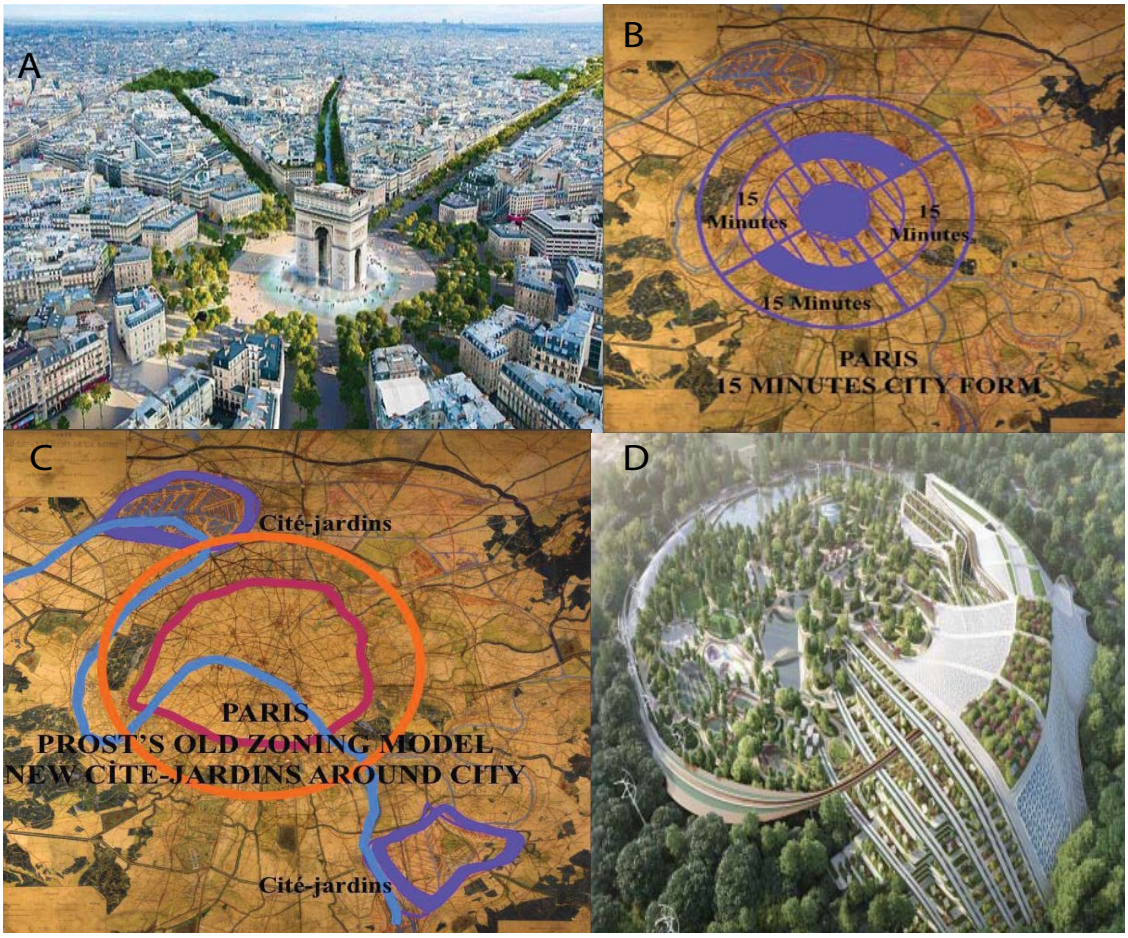

Figure 5: Paris, a) Radial City Plan, Photo, https://medyascope.tv/2021 (Left); b) Paris 15 Minutes City, Photo, *cite-jardins* Garden-city, Designed by Autor, Original IFA Archives, Paris (Right); c) Paris City planned in the early 20th Century by H. Prost with *cité-jardins*, Map, Designed by Autor Original IFA Archives, Paris (Below, Left); d) Modern Paris, Block-Style-Garden-Cities, Photo, https://mymodernmet.com/rescubika-garden-city-paris/ (Below, Right).

proposal plan stems from the Prost plan and is now evolving towards more sustainable urban planning due to the pandemic. It is also noteworthy that some new regulations were implemented in Paris within the scope of sustainability long before the pandemic. These are believed to have laid the groundwork for the measures taken in response to the pandemic. (Figure 4b) *Paris en Commun's* (Paris common) manifesto sketches out future plannings with walkable, hyperlocal city and Paris Roads would be given up to public, semi-public areas, parks, green areas, pedestrians and bikes, with car lanes further trimmed down daytime schoolyards could become nighttime sports facilities or places to cool off on hot summer nights, as well as the smaller retail outlets—shops, bookstores, grocery stores—using a "Made in Paris" tag as a marketing tool and everyone would have access to a nearby health system while sports therapy facilities would be available in each of the city's 20 *Arrondissements* [4]. Also, another proposal is re-modeled according to East London's "Everyone Every Day" a hyper-local development model to boost social cohesion and economic opportunity in London's known as poorest borough, ensure community-organized social activities, and business developments within a short distance [4].

The other European cities and their COVID-19 applications

Like France's 15-minute city concept, Italy has also implemented parallel policies and practices to promote sustainability and mitigate the effects of COVID-19, including the development of integrated assessment approaches to facilitate better response strategies. Some Italian cities have allowed the development of measures by considering various socio-economic and environmental factors such as sources of air pollution, urban ventilation, and population density [7].

Related to accessibility, other circumstances emerged in cities due to COVID-19, leading to the need for re-planning urban areas within a new urban network. These include creating organized, walkable urban environments, providing more public spaces, parks, and children's playgrounds, and developing architectural and urban solutions for the future that prioritize safety [26].

However, the pandemic has also made cities less social and more anti-social, with social distancing measures limiting interactions between people. In other cities where governmental restrictions were implemented, transportation

has significantly decreased. Recent empirical evidence has shown a decrease in social mobility of up to 76% in Spain [9], also similarly in India [27]. Moreover, significant reductions in other sectors and people's activities, such as retail and entertainment, supermarket and pharmacy visits, and park visits have been observed in the Netherlands [28].

The COVID-19 effects on the work and offices emerged of the new working like remote and hybrid working styles

In Europe, especially in Paris, with the changing working conditions on the agenda, the 15-minute system in a city like Paris is favored for offering employees the opportunity to work in close areas where they can reach their homes within minutes. During the pandemic, as people were forced to stay at home for extended periods, there was a growing realization that more comfortable, car-free, and healthy living options were needed. The employees' living and working areas in precise surroundings are significant, along with access to essential services [4]. Aimed at the needs of urban life in modern cities, the new city model proposes to assemble simple human needs like working and habitation in the shortest way. Paris City has replaced the old model and developed a neighborhood into a new, accessible 15-minute city model by a short walk or a bike ride to work, parks, schools cafes within a quarter [18] (Figures 4b-d).

In other countries, big American companies implemented various measures and developed new working conditions such as remote work or hybrid work for their employees. The pandemic necessitated changes in work patterns, with remote working as well as hybrid working becoming the new norm for many employees. During the pandemic, this newly developed working schedule was supported by major companies like Google, Amazon, Microsoft, and Twitter, among others [2]. COVID-19 started the effects of considerable impact to become symbolized by vacant office buildings, empty shopping malls, and abandoned flats in metropolitan areas [29]. The city centers, once vibrant and bustling business areas known for their high-rise buildings, have now lost their appeal. Rents and houses for sale in city centers, previously among the most expensive districts, have dropped significantly, and mortgage rates have also fallen. Remote work is predicted already have reduced the value of office spaces by nearly 44% in New York City [30].

The COVID-19 effects on housing models in European and American cities

Radical measures have been implemented in European cities, including urban-scale restrictions and regulations specifically targeting work and residential neighborhoods, similar to Paris's 15-minute city model. Besides Paris, European cities such as Italy and the Netherlands have emphasized housing-based regulations, leading to significant changes in existing housing models with a focus on green spaces.

The pandemic served as an opportunity to reconfigure housing models in Europe. People started spending more time in their houses and apartments due to changed working schedules and remote work, or hybrid working, leading to the revisions of the existing houses, and the development of new housing models. These newly developed housing models come to the fore with new arrangements, especially additional office rooms, or turning a room into an office with larger green terraces, more green roofs, and apartment buildings with common green areas, and social areas adapting to the conditions imposed by the pandemic.

The COVID-19 pandemic prompted European cities, including Italy, to reconsider housing architecture. Many European cities have large populations living in high-rise buildings and apartments; in Europe, nearly 88% of the population, estimated at 1.5 million in Türkiye, live in poor conditions [31]. In response, architects in Italy developed new housing models, emphasizing semi-private and collective spaces to promote health and physical distancing. Due to limited access to public parks and green areas during the pandemic, houses were redesigned with the new design approach to open areas such as to include private terraces, collective spaces, and shared courtyards, supporting daily physical activity while maintaining social distances [32].

During the pandemic, a stark reality was revealed in European cities, especially in Italy, where 28.8% of the population lived in overcrowded apartments and encountered difficulties accessing basic services [33]. Italians preferred housing arrangements with more green spaces, providing access to green areas, terraces, or common spaces. Green design and green roofs played a significant role, offering both physical and visual benefits. Additionally, new constructions incorporated similar typological solutions, utilizing vegetable gardens, playgrounds, and simple resting, and reading places, catering to the changing needs during the pandemic [34].

In the UK, France, Germany, Italy, and Spain it was observed a longer period of fluctuation between 2019 and 2021 during the pandemic led to a slowdown in housing construction due to working people falling or changing demands for housing purchases. Due to health concerns, stay-at-home orders, and economic uncertainty, many metropolitan areas experienced a noticeable drop in their population turn to fewer buyers looking for homes and fewer sellers willing to list their properties or allow strangers to enter their homes during a pandemic [35].

Consequently, is A. Hidalgo's 15 minutes city a future sustainable model for cities?

The recent pandemic has not only influenced people's daily lifestyles but also intensified the impact on working conditions, leading individuals to make significant changes.

Figure 6: Paris, Newly Designed Modern Block-Style-Garden-Cities. Photo, https://mymodernmet.com/rescubika-garden-city-paris/

The COVID-19 pandemic has expedited the adoption of green and healthy lifestyles, which were previously considered potential solutions to climate issues in the 1990s. This trend is observable in various countries, including the United States, England, Europe, and Turkey. This trend is observed as evident in various countries including the United States, England, Europe, and Türkiye.

Although COVID-19 is considered an opportunity to re-planning cities, the pandemic also created a new awareness of sustainability, and the steps towards becoming more sustainable and cities on the ways to create their own ecosystems. Although this new process generated a chaotic milieu, it is seen as an opportunity for designing more sustainable cities. Indeed, post-pandemic cities started to grow in wilder and more sustainable ways creating with highly productive ecosystems [35]. In Paris, it was seen previously as a symbol of anti-urban sentiment; as they protested rising taxes, drivers signaling the revolt of car-dependent rural-dwellers against the green agenda designed by metro riding Parisiens [18].

The COVID-19 pandemic in European cities was viewed as a future opportunity to reconsider urban planning and housing design for the numerous populations residing in high-rise buildings and apartments. In Italy, architects developed new housing models, including semi-private and collective spaces, to promote physical distancing and health. Initially thought to be limited to urban life in Paris, post-COVID-19, it gained prominence as a sustainable application desired for future city implementations. Cities using the pandemic as an opportunity for long-overdue changes are also experiencing a rebound [18].

The 15-minute city concept, previously considered a simple pandemic-related suggestion, is not limited to the pandemic; it is also applicable in the context of future cities' sustainability. Designing cities to be less car-centric offers a business and residential environment reachable within 15 minutes by walking or biking, promoting CO-free, cleaner air, and healthier urban life. This approach challenges the modern urban planning norms of the mid-20th century and aligns with the sustainable city model dominant since the 1990s. It emphasizes the significance of providing a sustainable and healthy urban life, not only during COVID-19 but also in the future.

Efforts to promote sustainability have been ongoing for years, but the COVID-19 pandemic accelerated the transformation of cities towards sustainability and resilience. The pandemic highlighted the importance of green spaces, walkability, and alternative transportation modes, leading to rapid changes in urban environments to create more livable and sustainable spaces.

The 15 Minutes Paris concept, initially envisioned as a system of blocks, needs to align with the city's evolving structure. Over the years, Paris has expanded with new *banlieues* and *cité-jardins* (garden-cities) outside its walls, reminiscent of E. Howard's original garden-city model. To foster a future sustainable city, the focus should shift towards greener planning strategies, emphasizing sunny, airy, and eco-friendly urban development. This approach is in line with the early 20th-century ideals of planners like H. Prost, connecting eco-friendly *cité-jardins* (garden cities) in a more sustainable manner (Figures 5a-d,6).

Conclusion

This research investigates the 15-minute city concept implemented in Paris during the COVID-19 pandemic. It delves into the challenges faced by Parisians, explores measures adopted in other European cities during the pandemic, and discusses how the temporary measures implemented due to

COVID-19 are transitioning into permanent solutions. One of the innovative initiatives undertaken by the Mayor of Paris has evolved into a global urban design phenomenon, adopted, and implemented by cities worldwide.

Architectural-scale: In the context of Paris, historical constraints such as the ban on new constructions within the city since the early 20th century have led to a need for expansion to the city's outskirts. Modern garden-city plans are now offering solutions, promoting greener, airier, and sunnier living spaces outside the city's perimeter. These contemporary settlements, reminiscent of the H. Prost era, are not only fitting for future epidemic resilience but also align with sustainability goals. The integration of these modern communities into an extensive transport network enhances their viability.

Urban-scale: The application of the 15-minute city concept in Paris and its subsequent adoption in cities like London has raised questions about its adaptability to different urban layouts, especially those different from the radial city plan of Paris. Initially considered a temporary measure during the pandemic, the implementation of the 15-minute city concept in cities as new urban planning recently in the UK, where residents are confined to their neighborhoods, has become permanent. In Oxford which residents it is the year 2049, the UK City of Oxford is unable to leave their neighborhoods also creates some paranoia. This approach, although deemed necessary during the pandemic for public health reasons, has stirred public reactions.

While the 15-minute city concept is acknowledged for its potential benefits to human health, the imposition of permanent and long-term restrictions within confined spaces has raised concerns about its impact on human psychology. Living in such a limited environment for extended periods can lead to various health problems and psychological challenges. Despite its intended health benefits, the concept has been met with resistance from city residents due to the constraints it imposes on their daily lives and mobility. These challenges highlight the complexities associated with implementing such measures in densely populated urban areas.

Indeed, exploring potential challenges and problems that might arise from the implementation of the 15-minute city concept in other cities could serve as a valuable future research topic. This study has unexpectedly revealed that the Paris 15-minute plan, initially proposed in response to COVID-19, could have positive implications for the city's future sustainability. The measures taken during the pandemic period align with the steps already initiated since the 1990s concerning sustainability.

While these practices have been functional in shaping urban dynamics, the public reception of such regulations in the future remains uncertain. Despite the limited reaction during the pandemic, the permanent implementation of the Paris 15-minute plan could potentially lead to problems. Therefore, it is suggested that a more flexible approach considering human life should be adopted when implementing this plan in the future, ensuring that it aligns with both sustainability goals and the needs and preferences of the city's residents. This approach might facilitate a smoother and more accepted integration of the 15-minute city concept into urban environments beyond the immediate crisis response.

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