15-Minute City Concept as a Response to Designing Resilience Future Cities and the 'New Normal' of Urban Built Environments in a Post-Pandemic World

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Abstract— The Coronavirus pandemic was the greatest crisis that the world faced since the World War II and the impact of the pandemic runs to greater extents that it changed the world into a whole new formation. The entire world was deemed to lockdowns and the global population was restricted to their homes. This New Normal affected the world in numerous ways and the pandemic emphasizes the incompatibility of the modern cities to cope up with the pandemics. 15-minute city model was a concept that was thriving in the period of pandemic and some winning cases like city of Paris bought the lime light to the concept. According to its author Carlos Moreno the concept will result more healthier, resilient and sustainable future cities, but the same has been heavily criticized for contributing in gentrification and causing unreasonable demand on the built environment. The paper is to study this debate over the 15-minute city concept with the analysis of its practical implementation in selected case studies from different geographical as well as social contexts. And to identify the risks, strengths and threats that the concept may imply in future implication by analysing the cities that have used the concept in their reformations and to provide an insight for using the concept effectively in future development proposals.

Keywords - **Walkability, Cycling, 15 - minute city concept**

I. INTRODUCTION

The Coronavirus (Covid-19) is a pandemic which defined the greatest crisis of the modern world and it is the most critical challenge that the world faced since World War II. On 31st of December 2019, a cluster of pneumonia caused by an unknown source was found in Wuhan, Hubei, China and was reported to the World Health Organization (WHO). This novel virus was then termed as the Coronavirus Disease 2019(Covid-19) by WHO in February 2020. Since its initial emergence from Asia to its widespread to all the continents of the world, the effect of the virus has created an outbreak in the whole world. As for the statistics, by 15th May 2020, over 4,444,670 cases have been identified globally covering 188 countries. This has made the WHO to declare a global pandemic at the beginning of the year 2020. The term 'pandemic' is defined as "occurring over a wide geographic area and affecting an exceptionally high proportion of the population" which makes the this crisis lacks nothing to be a pandemic at it all senses. Yet the Covid-19 pandemic is not sloley a health crisis but also an unprecedented socio-economic crisis of global scale. All these countries and communities were facing unprecedented restrictions, and the world population are deemed to stay indoors for a considerable period of time. With the declaration of the pandemic the WHO recommended the world popullation to support the containment of the virus by quarantine, social distancing, and self-isolating themselves from the general public contacts. These essential procedures of pandemic containment indeed contradict with the desire of individuals for their social encounters and also conflict with the way our urban built environment are designed. Modern cities are not designed to cope with these new restrictions or with this new way of life but instead designed to cope with the pre-pandemic world where millions of people working, commuting, sightseeing and being part of numerous forms of social encounters on a daily basis, but that pre-pandemic world seems a long way off now. Though the covid-19 pandemic and its causes are unprecedented this is not the very first pandemic that the world faced. Over all these pandemics the cities have evolved and the modern cities are a result of this long and continual evolution. When the evolution is considered the historical data evidence that the city designs have been always affected by these historical pandemics, and they have always resulted new forms of the city.

From the early 2020 upto date most of the countries in the world was in lockdowns time to time, to prevent the rapid spread of coronavirus disease and these lockdowns critically limited and restricted mobility. These restrictions have caused a significant improvement in the global ecosystems, which is severely apparent in the air conditions around the globe. In contrast, once the economic impact is concerned these lockdowns have greatly contributed to the rising poverty all around the world. As the major portion of the economy lies on the population that leaves their houses to make a living or to provide essential services,

transportation is a crucial and a defining factor. Studies in relevant fields have emphasized the need of transport to avoid the economic collapse and transport is identified as the main means which sustains the agglomeration effects that turns the urban economies attarctive and simply make the urban labor market work. But transportation of the pre-pandemic world was solely dependending on automobiles and the reliance on automobiles is not suffiecient enough, specially for the developing countries, since the population that own vehicles are very less in these countries and mass public transporatation is a risk when the spread of coronavirus disease is concerned. The major issue of pandemic restrictions that the modern cities were facing was the **loss of social encounters due to the new 'stay at home' concept arose with the Covid-19 pandemic** and **the incompatibility of the present city forms to cope with the pandemic situations triggered by the inability to locate the 'New Normal' concept in the field of Urban Design.**

On the other hand irrespective to the effect of the pandemic, or precisely after the lifting of travel restrictions, the climatic challenges and the ecological imbalance strikes back to be the most thriving challenge of modern cities. According to the report made by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) world is all set to exceed the agreed limit of temperature increase by 2^0 and is about to reach 2.7^0 by the end of this centuty (IPCC, 2021; UNFCCC,2021b) as the countries are not coping in limiting the emission. Further it is identified that the severe impact of the climatic change will act on the cities and to worsen the situation by the year 2050 the global urban population will compose 68% of the overall population. Apart from the higher population the cities are the main driving component of all types of economies contributing over 70% of the global GDP. Therefore, the downfall of cities would have a cascading effect on the overall aglgorithm of the modern world. Considering this current status it is identified through numerous studies that the urban design of this post pandemic world should address, social cohesion, climate financing and develop urban design models that render higher societal outcomes, human centric designs, balanced ratio between ecology and built environment, alternative transport means, and at overall scale which adhere to the Sustainable goal 11 in developing cities that are inclusive as well as equitable. One such viable model that developed with concern to these is the '15-minute city model' which is a byproduct of Smart city model. In the year 2016 Carlos Moreno bought forward the conceptual idea and the implication of the concept in the City of Paris by its mayor Anne Hidalgo was the application that made the model notifiable in the urban planning discipline. The Covid-19 pandemic and specifically its locakdowns bought the 15-city model under the limelight.

The modern cities in the post pandemic world demands for few critical criterions spanning over a wide spectrum. The first among these is the affect of lost social encounters with the pandemic and the incapability of pre-pandemic cities to cater social encounters while supporting the pandemic containment and travel restrictions. This initially curated the ground for the development of urban models such as, 'compact city', 'walkable city' '15-minute city' and 'cities for people'. Specifically in models such as 15-minute city model the basis of the model was the intensive use of green means of mobility and the allocation of urban land for green spaces and wetlands to balance the effect of automobiles. Improving or optimizing the use of automobiles is not a post-pandemic strategy in sustaining cities but was commonly identified in pre-pandemic world along with the identification of 'Urban crisis' caused with the dependency on automobile for transportation in cities. Pandemic and its lockdowns made a deviation to this by adding more concerns on environemental aspects such as traffic calming with the use of green and wet urban ecology, pedestrian zones, car free inner cities or simply car free or car reduced neighbourhoods.

The positive output of the pandemic seems to be the behavioral change that the world was deemed to with the containment of the pandemic. Due to travel restrictions people were limited to their local neighbourhoods, reliance on the local community increased and means of transport for short distances turned out to be sustainbale alternatives such as walking and cycling in the place of car. Statstics shows that the urban population seems to use urban parks, green spaces, pedestrian zones more in the pandemic when compared to pre-pandemic times.

Further adding to the positive impacts world as a whole was introduced to more smart means of working, communicating or engaging with the rest of the world. Hybrid means of working was introduced with pandemic which led the practice to continue to the post pandemic world. As per the statistics number of companies have moved from their physical work space to virtual platforms while workforce move from urban housing to suburbans. Most of the scholars claims that the real implication of digitalization came to the world with the pandemic containment than its initial invention. In oppose to the positive aspect the disadvantages of working from home became a critical psychological and sociological issue affecting the workforce. The physical movement from home to work and back to home and the direct interaction with the community affect the social life as well as the development of professional lives of any urban individual. This basic need of engaging with the outside community have caused the before said use of green spaces within the city. And in post pandemic period, this increased interest on urban green spaces and dominance on pedestrian or cycling based means of transportation remains unchanged. With concern to this major cities started in restructuring after the pandemic by changing the car parks and school yards to green parks and neighbourhoods to walkable zones while widening pedestrian zones along the roads limiting the car movement. This is evidenced in many cities such as

Freiberg in Germany, Vienna in Austria, Valencia in Spain, Nantes in France where the green distribution in urban context surpasses the twice of the recommended green cover for cities as per the WHO guidelines.

It was common for most of the cities to transfor their public spaces to recreational spaces mostly for walking or cycling while keeping the physical distant in the times of pandemic. And also some of these cities strated to close down a part or the entire road dedicating it for pedestrian commuting with the aim of reducing the pressure on urban parks. These initiatives seems to be advantageous for the community as well as for the city thus made such inititatives to remain or continue their existance to the post pandemic world.

This organically originated pandemic induced way of life or the 'New normal' demands for a paradigm shift in urban designing. This shift is outlined by the above stated criterions such as, green mobility, optimized car movement, pedestrian friendly neighbourhoods, digitalization for the functioning of the cities, green and blue infrastructure, compacted mini neighbourhood, independent local units, inclusivity, and most importantly sustainable at its all spheres. The same outlines the 15-minute city concept and therefore this study intends to go for the detail analysis of the concept of 15-minute city in designing resilience post pandemic cities. The 15-minute city model is known for its positive characteristics but is also critically accused for some of the main characteristics. Thus create a debate over the concept and study intends to **identify the scope, outlining characteristics, stregths, weaknesses as well as risks of implementing the concept through a review on literature on precedent studies**. The study will be concluded with a **framework for the future implementation** with reference to Risks, stregths and weakness that embedded in the 15-minute city model.

III. 15-MINUTE CITY CONCEPT

Pre-mandemic cities were strongly depending on the automobiles and they were barely accessible without the involvement of an automobile. The urban form of the pre-pandemic cities therefore were a clear failure in the time of pandemic. Thus the same created a bottleneck in the pandemic when providing the essential services to inhabitants. Inorder to cope up with the pandemic most of the cities all around the world adapted many temperory initiates to survive through the pandemic. Amidst many successful cases the City of Paris was under the lime light for its sustainable survival in the times of pandemic. 15-minute city concept was adapted for the reformation of the city which led paris to sustain through pandemic while boosting their economy, reviving social cohesion.
Based on this success number of cities have already adapted the concept as a temperoroy initiative and implying it as a permanent urban reform is highly viable in sustaining the post-pandemic cities. The 15-Minute city model is based on 'chrono-urbanism' which outlines an inverse

proportion between quality of urban life and amount of time spent on automobile based transportation. The central idea of the city model is the walkability of public amenities, residential units, workplace and other public spaces (Abdelfattah et al. 2022,p.331). And further in the context of 15-minute city model 'Walkability' is identified as the extent to which the physical structure of the city consisting of both natural as well as built environment, positively influences walking optimizing the automobile mobility. The concept of 15-Minute city was founded by Carlos Moreno, who initiated an urban set up in which the local residents were able to reach their essential needs within 15 minutes of time using active transportation such as walking or cycling. The updated form in concern to pandemic, Moreno states the need of fulfilling six essential urban social functions, such as, *living*, *working*, *commerce*, *healthcare*, *education* and *entertainment*. To attain these social functions, according to Moreno the urban built landscape needs to reform essentially including components such as, proximity, diversity, density and digitalization. The 15-Minute city model is characterized by ubiquitous deployment of Information Communication Technology(ICT). Following the success number of cities reformed their city structures adapting this concept and the vitality is proven in all most all those cases, due to which the concept gained recognition in the C40 Cities, WHO, UN-Habitat and Organisation for Economic Co-Operation and Development (OECD).

Figure 4. The 15-Minute city framework

Based on the practical success, vitality in sustaining cities, the concept of 15-miuntes city model is one resilient urban reform framework that promote, walking, cycling and social encounters while accommodating digitalization through which economic growth is acquired.

IV. AN OVERVIEW OF INTERNATIONAL IMPLEMENTATION OF 15-MINUTE CITY CONCEPT

'New Normal' or the new way of life after the pandemic paved ways to initiate permanent sustainable urban models that promote social, environmental as well as economic sustainability. 15-minute city concept is used as a reforming model in most of the cities in the post pandemic

times yet there are number of oppositions made against the concept and is severly criticized for some of its criterions. Therefore prior developing a framework to implement the concept in future development a review of literature is conducted on different precedent cases with the aim of identifying stregths, weaknesses and risks of the concept. The below table shows the 15 main research papers used for the systematic analaysis on the existing literature on practical application of 15-minute city model in different countries in the world along with 20 more web articles.

	Authors	Title	Case study	Remarks
01	Tim Schauenberg	15-minute cities: What are they and how do they work?	1. US City of Portland 2. Barcelona 3. Shanghai	*Impact of less traffic on business. *Physical transformations *Statstics on financial benefits of using active transportation means.
02	Carlos Moreno, and authors	Introducing the "15-Minute City": Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities	None	*Defining characteristics of the concept *Variations of the concept in later stages *Smart cities, collective intelligence and Place identity
03	Peter Mocak, and authors	15-Minute city Concept as a Sustainable Urban Development Alternative: A Brief Outline of Conceptual Frmaeworks and Slovak Cities as a Case	Cities of Solvakia	*15-minute city concept for resilience cities *Concept of chronourbanism *Behavioural Geography
04	Georgia Pozoukidou, Zoi Chatziyiannaki	15-Minute City: Decomposing the New Urban Planning Eutopia	1. Portland 2. Melbourne 3. City of Paris	*Three evaluation pillars – Inclusion, Health and Safety
05	Zaheer Allam, and authors	The '15-Minute City' Concept can shape a net – zero urban future	None	*Need of new urban design paradigm *human concerns on the place of constrained within 15-minute radius
06	Alexandros Bartzokas, and authors	Quantifying and Visualizing the 15-Minute walkable city concept across Europe: a multicriteria approach	Eastern, Northern, Southern and Western Europe	*economic performance of the 15-minute city concept * Walking performance of functional urban areas *key role of intergrated land-use planning and transportation networks
07	Zaheer Allam, Carlos Moreno, and authors	Proximity – Based Planning and the "15 – Minute City': A Sustainable Model for the City of the Future	City of Paris	*merits of denser urban context in implementing the 15-minute city concept *need of promorting walking hence the need of proximity as the defining feature
08	Shanqi Zhang, and authors	Towards a 15-minute city: A network-based evaluation framework	Nanjing, China	*policies and intervention strategies of planning an developing 15-minute city
09	Jingjing Luo, and authors	Assessing Inequity in Green Space Exposure toward a '15-Minute City" in Zhengzhou, China: Using Deep Learning and Urban Big Data	Zhengzhou, China	*Evaluation based on Green space exposure inequity *framework engaging the Green View Index (GVI)
10	Anu Kuncheria and authors	Socially-aware evaluation framework for transportation	1 Oakland, 2 San Jose 3 San Francisco	*traffic impact analysis *framework based on traffic routes
11	Javier Antolin and authors	Development of an Evaluation	None	*evaluation model with two phases- City level and project level
		Framework for Smartness and Sustainability in Cities		
12	Fangning Wu	Assessing Spatial Accessibility to Public Facilities for Vulnerable People towards 15-Minute City in Hong Kong	Sham Shui Po and Tin Shui Wai in Hong Kong	*three aspects of 15-minute city concept evaluation; spatial distribution characteristics, service population ratio and number of facility amenties
13	Fernando T. Lima and Freerico Costa	The Quest for Proximity: A Systematic Review of Computational Approaches towards 15-Minute Cities	None	*computer based analysis model for 15-minute city model based on pedestrian accessibility and street network
14	Efthymis Papadopoulos and authors	Measuring compliance with the 15-minute city concept: State-of-the-art	None	*holistic compliance assessment based on the key factors of the concept
15	Alva Zakariasson	A Study of the 15-Minute city concept	Munich, Germanry	*theoretical framework for the construct of long lasting public spaces, interactive and live streets

Table 01 – Summary of case studies

a. Shanghai city, China

Away from Paris China had independent attempts in adapting the 15-minute city concept to its main urban nodes and Shanghai is one of the prominent cases in China which adapted the '15-minute living circle' with the implementation of master plan development in 2004. The amended plan of 2018 aims to make 99% accessibility to public services within 15-minute walking and 90% of the population to access a public open space within 15-minute walk by the year 2035.

Figure 5. Proposed amenties to be included in 15-minute living circle of Shanghai.

Source: Shanghai Urban Planning and Land Resources Administration Bureau (2016)

The city of Shanghai adapted the 15-minute city concept as 15-minute living circle, in which the concept was adapted as spatial unit. It was aimed to stregthen the community, preserve their identity while planning the establishment to consume resources efficiently. The initiatives believe that the origin of the concept of 15-minute living circle was in East Asia, namely, Japan, Korea and Taiwan. The uneven urban settlements and development clustering all the essential services to city cores made the adaptation of this 15-minute living circle concept in China.

Right with the meaning of the wording, circle comes with boundries, demarcating a specific geographical zone, housing a certain group of people (Hou 2017). Within the concept it is desired to have housing, healthcare, eployment, education, commercial, recreational within this boundry which is accessible within 15 minutes of walking. Though it is an adaptation of the original concept of 15-minute city the prominent distinguish difference in this 15-minute living circle in Shanghai is its service circle which extends its concern to experiences that may occur with its establishment and thus make necessary amendments to the service circle creating multiple forms or faces of experiences to the inhabitants. Further the development and its implication includes all most all the fractions of the community inclusive of all the vulnerable parties creating its service circle inclusive. The successful implication of this 15-minute living circle in Shanghai have attacted attention of many cities and Beijing and Guangzhou are two such examples of adapting the 15-minute city concept after the successful implication at Shanghai.

b. Melbourne

Melbourne in Australia have adapted another deviation of 15-minute city concept as the '20 minutes neighbourhoods'. Melbourne is the second largest city in australia and the authorities have developed a master proposal for the years 2017 to 2050 and the plan is named as the 'Plan Melbourne', in which the 20-minute neighbourhood is proposed as a focal point according to The State of Victoria Department of Environment, Land, Water and Planning published in 2017. The detailing of the concept by the State of Victoria Department of Environment, Land, Water and Planning state that the concept of 20 minutes neighbourhood is all about living locally, and thus the city formation is done under the said plan to support it. The city plan therefore, includes most of the essential services within a limit of 20-minutes making the people of a given neighbourhood accessible for all most all their daily essentials within a limit which is accessible within 20minutes. Further in to the details this model provides the inhabitants the ability to go to work, school and return to their homes within 20 minutes while shopping, recreatioanl facilities, all being included within the same vicinity. And the 20 minute neighbourhood is also supported with cycling facilities as well as a variety of local-public transport options within the neighbourhood to increase the accessibility while reducing the time consumed for travelling.

The above stated master proposal is said to be developed in parallel to the Agenda 2030 for the Sustainable Development Goals (SDGs), particularly the goal number 03 which is Good Health and Well-being and goal number 11 which is Sustainable cities and Communities.

Figure 6. 20 minutes NEighbourhood Develeopment in Melbourne, Australia. .

Source: The State of Victoria Department of Environment, Land, Water and Planning (2017)

The adaptation of the 20 minutes neighbourhoods was comenced with a pilot programme which included three selected cases, namely: Strathmore in Moonee Valley city, Croydon South in Maroondah city and Sunshine West in Brimbank city (The State of Victoria Department of Environment, Land, Water and Planning, 2019). After the successful implictaion at the pilot programme the addendum to the Plan of Melbourne states that the city will proceed in adapting the 20 minutes neighbourhood concept. Further the suggestions made after the pilot programme includes the importance of strong and active partnership between all the levels of state and the community, which is crucial for the empowerment of the community.

The pilot programme have further adapted the place based approach in designing and developing the 20 minutes neighbourhood while allowing the location specific, community specific criterions to act independently upon the respective neighbourhood development. This approach evidenced to be most effective as per the analysis made on the pilot programme. This particular approcah prevent standarised implications of state over all the communities yet allows more respensive systems which make the functionality effective and efficient. The same evaluation bring forward the crucial requirement of the entire plan which ensure the connectivity between different neighbourhoods and the distribution of investment on infrastructure to be based on the planned density. As for an example it is stated that the neighbourhoods planned to be most densed should also be the one to get the benefits of new investments on public infrstructure in the overall plan.

c. Stockholm, Sweden

Stockholm is another adaptation of the 15-minute city concept, in which the concept was stretched to its exteme ends making the city's adaptation as 'the one minute city'. Vinnova is the the Sweden's agency for innovation which initially pushed the city of Stockholms to adapt the 15-minute city concept. Along with the respective levels of the state the Vinnova agency aims to create future city of Stockholms into a more sustainable as well as inclusive city by launching a national level plan. Though the city's

concept was named as one minute city it is not literally a one minute city yet a compressed form of the 15-minute city concept. Specifically in the case of Stockholms the plan was prepared focusing the streets. Not that all the services are concentrated on to one street and make it accessible within one minute but the street was considered as a 'Place' which helps to develop new means of connection between the state and the community. Further this street based development plan promotes the contribution of citizens into planning. For an example in the development the citizens of Stockholms involved in deciding how much of an area should be dedicated for parking from their road, or the area needed for public spaces. The same was well detailed by Dan Hill who is the Director of Strategic design of Stockholms, One minute city, as he states the street of a city goes infront of ones home is the portal leading to outside world and if these streets are designed and developed including the necessary service amenities and spaces for the community addressing the views and perception of the citizen can directly empower the community while preserving the identity and sustaining the city. Most importantly in the Stockholm's one minute city plan the streets have been catered as a place which inhabits human but not a means of moving cars and other forms of automobiles and it is prooven effective in the adaptation and the authorities believe upon the evaluation of the city that the street based development will directly contribute in resulting a sustainable as well as inclusive swedish cities by 2030.

Figure 7. Conceptual Proposal of One-Minute street
Source: Utopia Arkitekter

The physical components that are included or proposed in the Stockholm's one minute city plan are not permanent or is not a compulsory feature of proposed one-minute city. Development of streets are mostly an independent case and each street accommodate the views and needs of the inhabitants who live on that street. In the case of Stockholm's most of the features that are incorporated on the streets are seasonal and none are permanent only that some of the features can be relatively permanent than the others. However, the evaluation of the one minute city of Stockholms emhasize the participatory feature of the street based development plan as the key to sucessful implication of the concept of 15-minute city.

d. City of Paris, Paris

City of Paris is one of the most popular cases of 15-minute city concept and came under the lime light specifically in the times of pandemic. The 2020 national election for the Mayor was won by Anne Hidalgo for the second time due to her election campaign in which she promise in reforming the city of paris in to 15-minute city (Moreno 2021). After delivering her oaths as the new Mayor she initiated the 15-minute city development, and in the plan it is clearly stated that the particular adaptation will launched only through a reformation but not via a reconstruction. Therfore the development proposal by the state was to amend the city form and reform it as per the concept of 15-minute city but does not include any demolition of the city and rebuilding it as per the concept. The plan named as 'La ville des Proximites' was initiated in the city of paris by reforming the existing spaces into more active, existing spaces with a variety of numerous activities which helps in creating more flexible spaces (The city of Paris 2021).

The plan of La ville des Proximites included three separate themes which are proven to be the most important three cornstones of the entire reformation. The first theme among the three is the development of schools as the capital of that district, in which the school as well as college courtyards will open its doors to the general public in off hours. The reasoning for this theme was made by the authorities as the school or college courtyards with its authentic nature are designed to play, gettogether, relax or simply hang as groups. The development proposal is to converst existing spaces but not to demolish them so adapting the same, the first theme enable the use of existing school/college courtyards for public reacreational activities after the school hours.

The second theme among the three is to promote 'culture' and bring back it to the local community and to make them close with the concept of culture. Numerous means were identified and proposed by the development proposal to promote culture and bring it closer to the local citizens, and creating platforms for local artists outside of the existing Parisian Cultural Institution in every district is one such sucessful initiative.

The third theme of the development plan is the democracy devoted for participatory planning. 'Citizen Kiosks' is one such initiative where the local citizens will meet the city authorities and officials, where they can openly bring forward their needs, viws, perceptions and desires that needs to be addresd in the future city reformation.

Apart from these three thriving themes the overall development plan of 'La ville des Proximites' aims to achieve social and cultural sustainability, and street was again considered as basic component in the paris development plan too.

The street based development is further detailed in the 'Le Plan Velo' which means the the Paris Bicycle Plan, aiming at making the streets of paris city bycycle friendly by the year 2024. This plan have initiated the development of REVE which is an express bike network in which

650kilometers of both permanent as well as impermanent byclce lanes will be constructed connecting the paris city. The 'La ville des Proximites' plan includes number of different sub plans to reform paris into a 15-minute city, and the plan named 'Champs Elysees' is belived to be the most controversial proposal ever made under the 'La ville des Proximites', is to change the 1.9kilometers long Champs Elysees street which is highly densed and conjested with automobiles into an extraordinary garden. In this the traffic dominant street will be completely formed into a pedestrian oriented public space (Carey 2021).

Table 02 – Summary of case studies

IV. ANALYSIS OF THE 15-MINUTE CITY IMPLICATIONS: CHALLENGES, RISKS AND STRENGTHS

The above subsection details few realtime application of the 15-minute city concept and the analysis of the literature on the selcted four cases is used to identify the inherited Stregths, Risks and Challenges that the concept of 15-minute city possesses. The four different cases right from its initial plan name are different from one to another. The different cases used different forms, motivations, means of transportation in their adaptation yet the core values of the 15-minute city concepts, which are, density, diversity, proximity and digitalization remains unchanged in all the four case studies. In all the four cases the main priority was to consider the proximity and the urban amenities being included within the 15-minute proximity and also to make the urban neighbourhoods walkable and provide the ability to get all the essential daily needs by walking. Except for the proximity and walkability the 15-minute city concept involves the neighbourhoods into the planning as the primary unit of the development and also the means which we should use to look into the details of the city. Further the concept emphaiszes the need of reducing use of automobile for transporation and to reduce the traffic congestion in urban areas by promorting public transport services, walking and cycling kind of sustainable means of transportation. However, the need of sustaining future cities as proven by the pandemic 15-minute city concept is worth studying beyond the critical debate upon the concept. Therefore the exiting lietrature on the four selected case studies were analysed to distinguish the Stregths, Risks and challenges that the 15-minute city concept posses thus can be considered in future adaptation.

1. Strengths
1.1 Resilience
The 15 minute city concept is mostly known for its inherent character of resilience that is able to make the cities resilient in the future run. The initial concept and its features make the city accessible within 15-minutes and the same make the cities function smoothly and sustainably while inhabitants can access all most all of their essential services within 15-minutes. Once these cities strated to function smoothly they automatically become economically resilient too. With the success of the cities adapting 15-minute city concept in the time of pandemic and their ability to survive through the unprecedent crisi cuased by the pandemic stands as an evidence for the concept's inherent resilence. Therefore, it is seen that the concept of 15-minute city is viable to create resilent cities that can withstand natural or other form of disasters either they are forseen or not. In times of pandemic or in adverse weathers, the risk of people moving outside is most reduced in the 15-minute city concept as the city is developed to be in dense and compacted clusters concentrated with all the services, reducing the requirment of traveling to reach the essential services.

Further adding to the resilient character the development of neighbourhoods as per the 15-minute city concept make the real estate sector benefited. As per the literature and real estate agents, the neighbourhoods that are developed in accordance with the 15-minute city concept result in smoothly functioning, self-supporting, resileint neighbourhoods generates demand raising the real estate values.

1.2 Reducing the dominance of auto-mobiles and promote walking and cycling.
The concept of 15-minute city is sustainble even in its initial conceptual idea, in which it is proposed to reduce the dominance of automobile in urban transporation while promorting sustainable alternatives such as walking or cycling. Further as per the city officials who initiated the dapatation of the concept of 15-minute city in the case studies inidcate that the now more than ever befor the present cities need more open spaces housing greenery which support the social encounters and also contributing in mitigating the increasing climatic crisis. In most of the cases the adaptation of the 15 -minute city concept takes street as the base and propose the street to be places rather than the conveyors of vehicles and people. This development of streets under the 15-minute city concept seems to attract more people into walking resulting more and more livable spaces in the urban developments. The elimination of automobiles from the street bring forward vibrant yet hidden characters possesses by the streets. The 15-minute city concept with its street developemnt along with the adaptation of human scale in micro mobility and

mixed land use creates the streets and immidiate spaces follows the argunment drawn by Jane Jacobs as "eyes on the street" (Jacobs 1961). Further according to Jane Jacob mixed use contribute in creating active, live, inviting and vibrant streetsscape in cities, and the same is detailed under the 15-minute city concept. And also as per the argument made by Jacobs claims that the mixed land use results in safer streets and the same stregthen the life at streets. As per all the selected case studies it is shown that the 15-minute neighbourhoods needs to be crucially implemented with mixed land use including diverse functions and population while eliminating the automobiles replacing it with walking or cycling, increasing the vibrancy of community, neighbourhood and streets in the macro image.

1.3 Simple concept that is easy to understand as well as easy to apply

The concept of 15-minute city at first is easy to understand as the concept is simple and have no any complicated theories or concepts involved. The detailing of the concept clearly point out the weaknesses of the existing cities and their infrastructure with regards to its accessibility being dominantly depend on automobiles and spatial expansion primarily done via urban sprawl further increase the need of transportation for long distances.

Adding to the same point the designers and officials who engaged in the development of case studies indicates that the 15-minute city concept and its conceptual model of compacted 15-minute city clusters is the same requested by the city inhabitants. The current popular trends of living healthy and tendency towards sustainable living in closed and dencesd neighbourhoods promotes the concept of 15-minute city more specifically after the corona virus pandemic.

2. Risks

2.1 Market Forces

One of the main Risks identified through the case studies is the timing of the market while constructing 15-minute city concept. The phrase 'timing' is detailed in the following subsections.

2.2 Imbalance between Social and Regional components

Through the case studies and in relevant literature it is shown that the concept of 15-minute city and its adaptation can cause an imbalance between the city and the regional areas away from the city. Further with the 15-minute city concept adaptation self-functioning neighbourhoods will be created seperately, thus will influence the segregation and create patterns of segrgation amidst the 15-minute neighbourhoods.

2.3 Uncertainties

Starting from the definition to detailing, theories and tools the 15-minute city concept is ambiguous. The concept is universally adapted and turned into a practice without properly and solidly defining it, and in four case studies it

show case the wide span of the concept that vary from the initial concept. In the four case studies except for one all other 3 doesnot adhere to 15-minute concept rather they change and amend the concept as per the particular city. Further the variety of the concept cities focus on different aspects in their development making the overall adaptation of the concept in the world different from one to another. Except for the core pillars of the model as invented by Carlos Moreno, namely, density, diversity, digitalisation and proximity all other aspects differ from case to case and further even in the initial detailing of the concept by the inventor does not include proper definition on these four pillars, or the overall concept as a whole.

3. Challenges

3.1 Affordability and housing

The initial idea of creating self-functioning neighbourhoods, including all the essential services within a limit of 15-minutes increase the real -estate values and it was discussed under the strength of the concept. But in contrast to the raised demand and price, at the initial detailing of the concept Moreno (Moreno et al 2021) states that the neighbourhoods developed under his concept should be affordable and commonly available for the population. The higher price of houses due to the supply of services is therefore a challenge as the two aspects of the concept negatively impact on each other.

3.2 Mobility

The 15-minute city concept initially sugest to alter the mode of transport into more sustainable alternatives such as walking and biking eliminating the use of automobiles. Yet the dominance created over the automobiles in recent years is hard to defeat or alter, and such changes will not get positive response from the community. Based on this the pandemic was identified as an opportunity to set such trends of walking and fulfilling essential needs from the closest possible without traveling long distances. This is excatly where the concept of 'new normal' should be put in the field of urban designing and designing resilent cities. The 15-minute city concept support this situation to the fullest as evidenced from the four case studies.

3.3 Maintaining a balanced Built environment

The 15-minute city concept demand for further densed and compacted urban neighbourhoods, while modern city expansions and developments have caused a significant threat on the urban green spaces and urban ecology. Achieving the driving and guiding criterions of the concept further leads the open and green spaces of the built environment in to shrink.

V. FRAMEWORK FOR THE IMPLICATION OF 15-MINUTE CITY MODEL

The development of the framework primarily was based on 6 main dependent variables that defines the 15-minute city model. The six such variables were then detailed into 05 quantifiable criterions. Based on the identifications

made on Strengths, challenges and risks of the concept by reviewing the exiting literature 5 main analysis options are detailed in the framework. Overall framework will help evaluating a given city context quantitatively covering its both positive as wel as negative aspects.
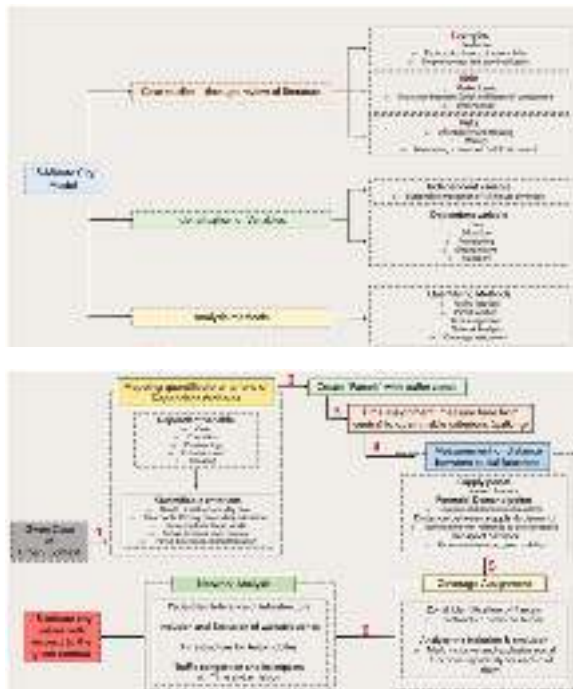

Table 03 – Framework for implementing and monitoring the 15-minute city model

V. CONCLUDING REMARKS

The post pandemic world demands for pandemic resilient cities than ever before. And it is further proved that the existing cities are not sustainable nor resilient in time of need. Compacted cities or urban reform concepts such as 15-minute city model seems to be more promising while in the pandemic and the study analysed the practical implication of the concept. While the core values remained unchanged the distance, mode of transport, motivation and aims can change and its is further identified that those needs to vary making the implications location specific. However, this promising concept is heavily criticized for the same and the study identifies the strengths, risks and challenges that the concept inherits and thus needs to be considered in future proposals along with geographical location, geographical behavioral patterns and modern city mechanisms.

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