

TeMA

Journal of
Land Use, Mobility and Environment

Cities need to modify and/or adapt their urban form, the distribution and location of services and learn how to handle the increasing complexity to face the most pressing challenges of this century. The scientific community is working in order to minimise negative effects on the environment, social and economic issues and people's health. The three issues of the 14th volume will collect articles concerning the topics addressed in 2020 and also the effects on the urban areas related to the spread Covid-19 pandemic.

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THE CITY CHALLENGES AND EXTERNAL AGENTS.
METHODS, TOOLS AND BEST PRACTICES

TeMA

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Land Use, Mobility and Environment

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

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The cover image is a train passes a rail road crossing that is surrounded by flooding caused by rain and melting snow in Nidderau near Frankfurt, Germany, Wednesday, Feb. 3, 2021. (AP Photo/Michael Probst)

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REVIEW NOTES – Urban practices

Toward greener and pandemic-proof cities? Policy responses to Covid-19 outbreak in four global cities

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Abstract

Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of a continuous updating of emerging topics concerning relationships among urban planning, mobility and environment, through a collection of short scientific papers. The Review Notes are made of four parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal. In particular, the Urban practices section aims at presenting recent advancements on relevant topics that underlie the challenges that the cities have to face. The present note provides an overview of the policies and initiatives undertaken in four global cities in response to the Covid-19 outbreak: New York City (US), Beijing (CN), Paris (FR) and Singapore (SG). A cross-city analysis is used to derive a taxonomy of urban policy measures. The contribution discusses the effectiveness of each measures in providing answers to epidemic threats in urban areas while, at the same time, improving the sustainability and resilience of urban communities.

Keywords

Covid-19; Urban policies; New York, Beijing; Paris; Singapore.

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1. Introduction

In December 2019, in the Wuhan province of China, a new form of Coronavirus (Covid-19) emerged. Since then, the virus has been spreading globally and, as of 05 June 2021, more than 200 Countries around the world have reported 196 million confirmed cases and a death toll of 4.16 million deaths (Template: Covid-19 pandemic data). The Covid-19 pandemic triggered both third and first world economies, causing severe disruption to society and business, especially in urban areas (OECD, 2020a).

2. Toward greener and pandemic-proof urban areas?

Urban areas have been the ground zero of the COVID-19 pandemic, with 90 per cent of reported cases (UN, 2020). They are densely populated places where people live and gather, thus at high risk of spreading the virus due to the close proximity among residents and challenges to implement social distancing (Neiderud, 2015). These conditions have generated a large debate about the future role of cities in the post-Covid scenario. In this respect, some authors have argued that large urban areas are nearly defenseless in times of unprecedented disease outbreaks (Desai, 2020) and that dense urban settlements are not compatible with the needs of social distancing (Megahed and Ghoneim, 2020). These circumstances, coupled with increasing dematerialization of services and pandemic-pushed growing teleworking rates, have prompted some authors to questioning the ever-growing urban concentration model and envisioning a resurgence of rural areas as alternative and safer mode of urbanization in the post-Covid society (Cotella and Brovarone, 2020).

On the contrary, other authors have stressed the pivotal role played by cities in the Covid-19 response in terms of implementing nation-wide measures, but also in terms of providing laboratories for bottom-up and innovative recovery strategies (UN, 2020; OECD, 2020a; UCCN, 2020). Advocates of this second line of argument have seen in the Covid-19 crises an unpredictable opportunity to reshape our cities toward a greener and pandemic-proof urban future (OECD 2020a; Lai et al., 2020; Pierantoni et al., 2020). These optimistic claims are supported by a growing body of interdisciplinary research. Synergies, indeed, has been identified between policies aimed at providing answers to epidemic threats in urban areas and policies aimed at improving the sustainability and resilience of urban settlements (Garcia, 2020; Barbarossa, 2020; Pinheiro et al., 2020). Decentralization of public facilities, prioritization of soft over car-centric mobility, hierarchization of the transport system and public services, and redundancy of public, green and open-space functions have been identified as integrated measures able to achieve both public health and city sustainability targets (Pisano, 2020; Sharifi et al., 2020). Within this context, the present short paper provides an overview of the policies and the initiatives undertaken in four major global cities in response to the Covid outbreak. This is followed, in paragraph 4, by a discussion on whether these measures are (or will) promote a sustainable urban recovery.

Global city definitions are numerous, with one study suggesting as many as 300 (JLL, 2017). This study relies on the definitions and ranking established by GaWC, the Globalization and World Cities Research Network (GaWC, 2020). According to this framework, cities analysed in this short note follow under the categories reported in the table below.

Case Study	GaWC rank	Rank description
New York City	Alpha ++	First-order, world's leading global centers, most integrated with the global economy.
Paris		
Beijing	Alpha +	Second-order, world's leading global centers. Highly integrated cities, filling advanced service needs.
Singapore		

Tab1. Classification of the case studies according to GaWC, 2020.

New York City



New York is the most populous city in the United States. With an estimated population of 8,336,817 inhabitants distributed over about 302.6 square miles (784 km²), it is also the most densely populated major city in the United States. The city is considered as the cultural, financial, and media capital of the world, significantly influencing commerce, entertainment, research, technology, education, politics, tourism, art, fashion, and sports. The city has experienced a sustained urban growth over the past few decades, characterized by the implementation of large-scale urban projects and the development of an efficient and modern public transportation network, coupled with a well-developed shared-mobility eco-system.

The pandemic has severely hit the city's dynamic economy and social life, reversing the long-standing growth trends that have characterized its economy, with leisure, hospitality, finance, administrative and support services being the most affected economic sectors. As a consequence — only in 2020 — the city lost 750,000 jobs, nearly one out of every six job. This lopsided impact has exacerbated previously existing income inequalities, since the devastating effects have had a concentrated impact on predominantly low-income workers of color, young adults, and women (Parrot, 2021).

During the first year of the pandemic, the city has adopted a number of measures to facilitate social distancing and containing the spread of the virus. For instance, the city expanded its pedestrian walkways and pedestrian-only streets, which has come in handy during social distancing, and has closed down numerous streets in the five boroughs to allow for more pedestrian walkway. As a result, 83 miles of additional car-free streets (also known as *Open Streets*) have been implemented in 2020. In addition to pedestrian walkways, bike lanes, which were once a hotly contested and controversial topic, have been incredibly expanded: the New York City Department of Transportation has indeed constructed a record 28.6 lane miles of new protected bike lanes since the beginning of the pandemic. In addition to pedestrian sidewalks and bike lanes, there has been also an emphasis on the recovery of the leisure activities: bars, restaurant and café have been allowed to expand their terraces onto sidewalks and even close roads in some areas, resulting in 10,800 so-called *Open Restaurants*. Other intervention for the 2020 year included the restoration and the expansion of several public green areas and blue spaces. In January 2021, the city Council adopted an integrated and more structured approach to urban recovery by delivering the *Recovery for All* plan, the Major strategy aimed at creating a stronger, fairer and safer city for all New Yorkers. The strategy is articulated around six main pillars and 33 lines of intervention. Most of them introduce transformations in the built environment as a tool to promote social and economic recovery. For instance, under the *Fight the Climate Crisis* pillar, the plan envisions to make the *Open Streets* initiative (developed during the previous year) a permanent part of the city landscape, while also opens applications for new streets, with a focus on local partner management and support. In addition, New York City will begin the construction on five new *Bike Boulevards*, streets that are designed to give bicycles travel priority and put cyclist safety first. Under the same pillar, the plan also envisions the development of new public spaces (particularly for neighborhoods hardest hit by COVID) that will help support local small businesses, foster community ties and provide space for arts and culture. The *Bend Government to Fight Inequality* pillar focuses on social and spatial inequalities. In this respect, the plan envisions, among other measures, the establishment of a permanent taskforce on racial inclusion and equity, with the aim of identifying the communities hardest hit by COVID-19 and driving new investments and initiatives in these neighborhoods. An important part of the plan concerns with the recovery and diversification of the urban economy. Actions in this domain are grouped under the *Build a New Economy* pillar and include, among others, the revitalization of small businesses by introducing a small-business recovery tax credits, as well as new loans scheme. Finally, particular emphasis is also given to the participation of the population (and especially the marginalized groups) in the decision-making process, as reflected in the *Community Power in Neighborhood* pillar.

Paris



Paris is the capital and most populous city of France, with an estimated population of 2,148,271 residents. Paris is one of Europe's major centers of finance, diplomacy, commerce, fashion, science and arts. While its historic center is one of the most popular destinations in Europe, the recent expansion of its outskirt areas has been characterized by a poorly regulated development, coupled with inadequate infrastructure provision and consequent social and economic exclusion.

Paris has been strongly affected by the virus outbreak, with tourism, leisure and mobility being the economic sectors suffering the most. At the same time, the pandemic was an eye-opener to city administration and an occasion to put forward an ambitious strategy started in 2014 and aimed to decarbonize city's economy and to make Paris a healthier city. Since 2014, the year of the first election of Mayor Hidalgo, Paris went through a series of policies that banned the most polluting vehicles from entry to the city, freed the quayside of the Seine from cars, and regained the space of the streets for more trees and pedestrian space. This process of pedestrianization of the city was fostered during the Hidalgo campaign for re-election 2020, *Paris en Commun*. This

campaign manifesto has been relaunched as a post-COVID strategy, introducing the concept of a “15 minutes city”, in which citizens’ basic needs, such as work, shopping, health, or culture, should be available within 15 minutes of their home. To meet this aim the city has implementing a coordinated mix of land use planning and urban design measures such as the relocation of schools, health centers and other public facilities, the renovation of urban public spaces and the expansion of the city’s network of public housing into wealthier areas. This urban design measures have been coupled with soft mobility measures aimed at making cycling and walking an attractive mode of transportation. In this regards, the most evident measure proposed is the extension of the urban bike network that connects the city center to the suburbs. This network was already under examination before the COVID pandemic, but its design has been accelerated and proposed as an emergency measure in order to allow more people to commute using the bike across Greater Paris. In total, more than 50 kilometers of lanes — normally used by cars — have been reserved for bicycles. Among them are the Avenue de la Porte d’Orléans, Avenue du Général-Leclerc (on the southern section), the Étoile tunnel and Porte Maillot. In addition, 30 streets have been designated pedestrian-only, in particular around schools, to avoid large groups of people gathering on sidewalks.

Beside these structural interventions focused on the urban built environment, the city has put in place several measures in the social welfare domain. In this respect, Paris developed a plan to support businesses, low-income families, cultural actors and associations, providing different forms of aids such as direct economic support, rent relief support, food aids, municipal taxes relief programs and discounts on the purchase of public transport subscriptions. The city also acted as “enabler” for private citizens and NGOs that want to help other citizens in need by creating an online platform that is helping people in need to connect with citizens willing to assist them. Particular attention has been devoted to the touristic sector. With a drop of tourism in 2020 — one of the main source of income for the city — of approx. 44% compared with the previous year, Paris has devoted a large part of the Covid response to recover this sector. Financial support has been provided to tourism and leisure activities, while the city’s Council has approved stringent health-safety measures aimed at increase the confidence in the tourist market by promoting the city as a safe and attractive place to visit and discover. Finally, as for many other EU cities, the Council of Paris has re-designed its city’s time-plan, rescheduling the opening hours of public services in order to reduce congestion and mass gathering at public locations.

Beijing



Beijing is the capital of the People's Republic of China and the world's most populous national capital city, with over 21 million residents. It is considered one of the world's leading centres for culture, diplomacy and politics, business and economics, and it is home to the headquarters of most of China's largest state-owned companies as well as private Fortune Global 500 companies.

As the capital city of the first country to experience the coronavirus outbreak, Beijing has been severely affected by the spread of the virus. Furthermore, the pandemic has highlighted the weaknesses of the prevailing Chinese urban developing approaches characterized by lack of green areas, functional mix and a scarce engagement of the city population in the decision-making process (Wu and Wang, 2021). At the same time, it has offered the possibility of reorienting urban policies toward more sustainable urban outcomes.

In contrast with the cities analysed in the previous two paragraphs, Beijing policy response to Covid-19 outbreak has been largely “decided” at the national level, with the Central State playing a leading role in issuing and implementing uniform, large-scale policy initiatives. However, especially in sectors such as urban waste management and buildings’ technologies, the role of the Beijing local administration has been pivotal.

Short-term emergency policy responses were prioritized during the early months of the pandemic. In particular, priority has been given to environmental management, particularly the management of medical waste in healthcare facilities and household waste in residential areas, and city management, in which digital tools have been used to track and contain the spread of COVID-19. Beside these short-term policies, long-term initiatives have been taken as the next step in the post COVID-19 response, especially in the sector of land-use planning, building design, public facilities planning, and city management. For instance, within the land use-planning domain, Beijing Municipal Government has initiated a land use regulation on strategic spaces, assigning 132 square kilometres of unplanned spaces for responding to future public services or major public safety issues. In addition, the new *Beijing Municipal Master Plan* placed a ban on new large wholesale wet markets and regional wholesale markets, or the extension of existing markets, within its jurisdiction, since these urban environments have played a pivotal role in the spread of the virus. Beside intervention in the land use domain, policies have been also issued in the building design domain. In this respect, different levels of governments have adopted a variety of responses in terms of building design and space use, to contain the spread of the virus. New design guidelines have been put in place for different types of buildings, including medical facilities, hotels for quarantine and treatment, office buildings, residential buildings, schools, shopping malls and supermarkets, and public places, such as transport, elevators, and recreational facilities. All of these responses are focused on regulating air conditioning and ventilation, water supply and drainage systems, waste management, cleaning and sterilization as a tools to contain the spread of the virus. In the public facilities planning domain, the pandemic has showed the importance of accessible green spaces, as well as the importance of easily-accessible public health facilities. In this respect, Beijing has put in place

measures to address the unevenly distribution of such facilities, by developing new facilities, especially in rural areas and new urban green space in both rural and congested urban areas.

Finally, an interesting — although isolated — initiative concerns the reframing of the *Xiong* area project. *Xiong* was indeed originally planned as a “new city” aimed at relieving pressure on the over-congested Beijing. The coronavirus outbreak however has seen Beijing’s administration reframing the original project to accommodate a pandemic-friendly, self-sufficient urban development, to reflect the lessons learned during the virus outbreak. According to the new plans, the proposal — developed by the Barcelona-based Guallart Architects studio — will include wooden buildings with large balconies and shared 3-D printers that will allow residents to produce resources locally, and provide all amenities even in moments of confinement. This new development will collocate in the same area different urban functions, such as residential buildings, public services and commercial malls, highlighting the importance of proximity and self-sufficiency.

Singapore



Singapore is an island city-state in maritime Southeast Asia. With a population of 5.6 million inhabitant distributed on an area of 728.6 km², Singapore has the second greatest population density in the world. The country's territory is composed of one main island and 63 satellite islands and islets, the combined area of which has increased by 25% since the country's independence as a result of extensive land reclamation projects. Modern Singapore is a gleaming city of the future, a global financial centre, framed by lush and leafy greenery at every turn. It features an urban skyline including astonishing skyscrapers, designed by the most renewed architecture firms, as well as an efficient and modern public transportation network. These impressive urban achievements are the result of a long-term urban planning tradition (Henderson, 2012) that, as described below, is still very relevant in today's city approach to post-Covid recovery. Compared to other Asian economies, impacts of covid-19 have been relatively limited. However, the months-long restrictions resulted in a 5.8% contraction, the worst since independence, in gross domestic product in 2020.

On August 24, 2020, Singapore President Halimah Yacob revealed plans for the country's green recovery, announcing major efforts to foster sustainable growth while improving social safety nets and education. In contrast with the city of New York that has articulated an organic city adaptation response, Singapore response to the Covid-19 has been articulated around a number of sectoral policies regulating different aspect of the city life, including the recent *Singapore Green Plan 2030*. For instance, in the building sector, Singapore has recently released the *Green Building Masterplan*, which encouraged, enabled and engaged industry stakeholders in adopting new green buildings by raising the minimum energy performance requirements for new buildings and existing buildings that undergo major retrofit, to be 50% and 40% more energy efficient compared to 2005 levels respectively. In the transportation sector, Singapore is continuing to pursue alternative energy despite COVID-19. This includes various efforts to develop hydrogen as a fuel source. Furthermore, the city has imposed that new diesel car and taxi registrations will be ceased from 2025, with all new car and taxi registrations to be of cleaner-energy models from 2030. The road tax structure will also be further revised to bring down road tax for mass-market electric cars. In addition, 60,000 electric vehicle-charging points are targeted to be built by 2030. Efforts in supporting the transition to renewable energy are not limited only to the transport sector. Singapore has indeed been moving ahead with the deployment of solar photovoltaic panels in 2020 and 2021. Construction of the 60 MWp floating solar photovoltaic system on the Tengeh Reservoir commence will help the city in securing green energy, while at the same time overcoming land constraints that arise from limited land resources of the city. On the land use side, interventions have been target at strengthening public services with an attention to proximity and a strong focus on the development of new green areas and the decentralization of public facilities. In particular, by 2030, 1 million more trees would be planted, and every household would be within a 10-minute walk from a park. Over 130 ha of new parks will be developed and around 170 ha of existing parks will be enhanced with more lush vegetation and natural landscapes by end-2025, on top of a 1000 ha addition of green spaces by 2035. In terms of public facilities, the city aims at balancing the differences between neighborhoods, enhancing specificities, and trying to reduce inter-district travel. Accordingly, the city has started creating local services, especially in popular neighborhoods, with high population density and characterized by an older population. Finally, on the economic development sector, Singapore has introduced several measures to support businesses hurt by COVID-19. Businesses in green industries such as clean energy and electric vehicles, and businesses pursuing resource efficiency projects, are eligible for these business support measures.

3. Discussion and conclusions

As Covid-19 spreads across the world, cities have become epicenters of the pandemic, amplifying the spread and transmission of infection, with their dense population and transport networks. At the same time, cities have become catalyst of sustainable recovery. Many examples of good practices taking place in cities across the world are captured by dedicated and constantly-updated reports of international organizations such as

WHO (2020), UN (2020) and OECD (2020a) and UCCN (2020). This contribution provided a focus on global cities and examined policy response to the Covid-19 epidemic in a sample of four representative urban areas. A cross-city analysis of measures implemented in the cities under investigation can be a useful exercise to derive a taxonomy of urban policy measures. This is reported below, together with some considerations on the effectiveness of such measures in providing answers to epidemic threats in urban areas while, at the same time, improving the sustainability and resilience of urban communities. Considering the social, the physical and the functional subsystems composing the city, measures could be addressed to:

3.1 Physical subsystem

- *Expansion of cycling infrastructures.* Cycling is promoted by many cities as a recovery strategy since it can reduce pressure on crowded (and often depotentiated) public transport while allowing citizens to respect social distancing, thus lowering the risk of virus transmission. Especially in dense urban settlements, as those examined in this article, where commuting distances are compatible with the use of bike, cycling represents an alternatives solution to provide citizens with essential needs, go to work when necessary, and still perform some physical activity, even in times of pandemic outbreaks (Garcia, 2020). At the same time, the promotion of cycling in urban areas represents an essential ingredient to improve cities livability and reduce the externalities of car-oriented urban development (Ison and Shaw, 2012).
- *Improvement of walking paths/ expansion of pedestrian areas.* These measures can be considered effective tools to promote sustainable mobility while, at the same time adapting the city physical environment to the new challenges imposed by the virus outbreak. On the city sustainability side, these measures can contribute to sustainable mobility targets by shifting mobility demand from private cars to active transportation modes (Li et al., 2014). On the health side, ameliorate walkability has been demonstrated an effective tool to improve public health by promoting physical activity (Frank et al., 2006). Furthermore, extension of pedestrian areas and sidewalks can guarantee enough space for safe physical distancing while favoring business reopening by accommodating longer lines deriving for lower business accommodation capabilities (WHO, 2020).
- *Extension of green and open space functions.* Environmental benefit of public, green and open spaces are well-established: they contribute to the purification of water and air climate, to the regulation and mitigation of the urban climate, and support biodiversity conservation (Chiesura, 2004). Following the pandemic outbreak, researchers have found that the virus transmission spreads more easily indoors than outdoors (Morawskaa and Caob, 2020) and that urban green urban spaces have been crucial for exercise and mental wellbeing during the stringent lockdown (Razani et al., 2020). Extension of these areas represents thus a valuable contribution to foster city sustainability while, at the same, time providing concrete spatial planning answers to epidemic threats.

3.2 Functional subsystem

- *Decentralization of public facilities.* Decentralization of public facilities is considered a fundamental property to contain the spread of the virus since it allows people to be able to get the goods and facilities they need within the minimum distance from their houses, thus limiting the interaction with the other sectors of the population (Pinheiro et al., 2020). Furthermore, the decentralization of healthcare services can reduce the response time, and saving operating costs (Pisani, 2020). A balanced juxtaposition of homes and services, is thus not only a well-known urban planning strategy to reduce long-distance trips and promote active transport, but represents also an emerging tool for containing epidemic spreading.

- Improvement of IT infrastructures and digital services. These measures can generate positive co-benefits: the digitalization of public services can indeed reduce the need to travel while at the same time contain physical contacts between public servants and city users. Furthermore, IT technologies can also provide a fast and concrete response to citizen's needs. Investments in this domain should be thus certainly encouraged in the context of city's recovery plan.

3.3 Social subsystem

- Household / small business economic support. The pandemic crises has exacerbated the existing social inequalities while severely affecting cities economy. Measure aimed at provide households economic, social or rental support as well as measures target at provide relief to most affected economic sectors have been implemented in all cities under investigation. While undoubtedly necessary, these measure, if not integrated in a wider urban economic recovery strategy, can be considered only effective in the short term. Their impacts on cities sustainability and resilience is hard to demonstrate.
- Human capital development. According to OECD (2020b), the global pandemic is triggering substantial changes in the labor market. Accordingly, it is essential for governments to help workers transition to the post-Covid 19 economy. These measures are highly recommended by international organizations as they provide the ground for fostering citizens' resilience to current and future disruptive events.

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Image Sources

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