



TeMA

This Special Issue of TeMA - Journal of Land Use, Mobility and Environment, collects twenty-seven contributes of international researchers and technicians in form of scenarios, insights, reasoning and research on the relations between the City and the impacts of Covid-19 pandemic, questioning about the development of a new vision and a general rethinking of the structure and urban organization.



Journal of
Land Use, Mobility and Environment

TeMA Journal offers papers with a unified approach to planning, mobility and environmental sustainability. With ANVUR resolution of April 2020, TeMA journal and the articles published from 2016 are included in the A category of scientific journals. From 2015, the articles published on TeMA are included in the Core Collection of Web of Science. It is included in Sparc Europe Seal of Open Access Journals, and the Directory of Open Access Journals.



Special Issue

Covid -19 vs City -20

scenarios, insights, reasoning and research



ISSN 1970-9889
University of Naples Federico II

TeMA

Journal of
Land Use, Mobility and Environment

Special Issue

COVID-19 vs CITY-20 SCENARIOS, INSIGHTS, REASONING AND RESEARCH

Published by

Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"

TeMA is realized by CAB - Center for Libraries at "Federico II" University of Naples using Open Journal System

Editor-in-chief: Rocco Papa
print ISSN 1970-9889 | on line ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n° 6 of 29/01/2008

Editorial correspondence

Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

Given the short time to produce the volume, the Editorial Board of TeMA Journal carried out the scientific quality audit of the contributions published in this Special Issue.

The cover image is a photo collage of some cities during the Covid-19 pandemic quarantine (March 2020)

TeMA Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of land use, mobility and environment. Domains include: engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science and complex systems.

With ANVUR resolution of April 2020, TeMA Journal and the articles published from 2016 are included in A category of scientific journals. From 2015, the articles published on TeMA are included in the Core Collection of Web of Science. TeMA Journal has also received the *Sparc Europe Seal* for Open Access Journals released by *Scholarly Publishing and Academic Resources Coalition* (SPARC Europe) and the *Directory of Open Access Journals* (DOAJ). TeMA is published under a Creative Commons Attribution 3.0 License and is blind peer reviewed at least by two referees selected among high-profile scientists. TeMA has been published since 2007 and is indexed in the main bibliographical databases and it is present in the catalogues of hundreds of academic and research libraries worldwide.

EDITOR IN-CHIEF

Rocco Papa, University of Naples Federico II, Italy

EDITORIAL ADVISORY BOARD

Mir Ali, University of Illinois, USA

Luca Bertolini, University of Amsterdam, Netherlands

Luuk Boelens, Ghent University, Belgium

Dino Borri, Polytechnic University of Bari, Italy

Enrique Calderon, Polytechnic University of Madrid, Spain

Roberto Camagni, Polytechnic University of Milan, Italy

Derrick De Kerckhove, University of Toronto, Canada

Mark Deakin, Edinburgh Napier University, Scotland

Aharon Kellerman, University of Haifa, Israel

Nicos Komninos, Aristotle University of Thessaloniki, Greece

David Matthew Levinson, University of Minnesota, USA

Paolo Malanima, Magna Græcia University of Catanzaro, Italy

Agostino Nuzzolo, Tor Vergata University of Rome, Italy

Rocco Papa, University of Naples Federico II, Italy

Serge Salat, Urban Morphology and Complex Systems Institute, France

Mattheos Santamouris, National Kapodistrian University of Athens, Greece

Ali Soltani, Shiraz University, Iran

ASSOCIATE EDITORS

Rosaria Battarra, National Research Council, Institute of Mediterranean studies, Italy

Gerardo Carpentieri, University of Naples Federico II, Italy

Pierluigi Coppola, Politecnico di Milano, Italy

Luigi dell'Olio, University of Cantabria, Spain

Isidoro Fasolino, University of Salerno, Italy

Romano Fistola, University of Sannio, Italy

Carmela Gargiulo, University of Naples Federico II, Italy

Thomas Hartmann, Utrecht University, Netherlands

Markus Hesse, University of Luxemburg, Luxemburg

Seda Kundak, Technical University of Istanbul, Turkey

Rosa Anna La Rocca, University of Naples Federico II, Italy

Houshmand Ebrahimpour Masoumi, Technical University of Berlin, Germany

Giuseppe Mazzeo, National Research Council, Institute of Mediterranean studies, Italy

Nicola Morelli, Aalborg University, Denmark

Enrica Papa, University of Westminster, United Kingdom

Dorina Pojani, University of Queensland, Australia

Floriana Zucaro, University of Naples Federico II, Italy

EDITORIAL STAFF

Gennaro Angiello, Ph.D. at University of Naples Federico II, Italy

Stefano Franco, Ph.D. student at Luiss University Rome, Italy

Federica Gaglione, Ph.D. student at University of Naples Federico II, Italy

Carmen Guida, Ph.D. student at University of Naples Federico II, Italy

Andrea Tulusi, Ph.D. at Second University of Naples, Italy

Special Issue

COVID-19 vs CITY-20

SCENARIOS, INSIGHTS, REASONING AND RESEARCH

Contents

- 5** EDITORIAL PREFACE
Carmela Gargiulo
- 9** **Covid-19 and simplification of urban planning tools. The residual plan**
Pasqualino Boschetto
- 17** **Covid-19. Some moments of the 21st century, with a look at Milan**
Roberto Busi
- 31** **Geographic Information and Covid-19 outbreak. Does the spatial dimension matter?**
Michele Campagna
- 45** **Health emergency and economic and territorial implications. First considerations**
Salvatore Capasso, Giuseppe Mazzeo
- 59** **About the effects of Covid-19 on solid waste management**
Alessandra Cesaro, Francesco Pirozzi
- 67** **The city and natural resources.**
Pandemic disaster can be a driving force for new perspective
Donatella Cialdea

- 81** **Evolution of mobility sector during and beyond Covid-19. Viewpoint of industries, consultancies and public transport companies**
Pierluigi Coppola, Francesco De Fabiis
- 91** **Tourism on demand. A new form of urban and social demand of use after the pandemic event**
Fabio Corbisiero, Rosa Anna La Rocca
- 105** **Questioning urbanisation models in the face of Covid-19.**
The crisis as a window of opportunity for inner areas
Giancarlo Cotella, Elisabetta Vitale Brovarone
- 119** **The Covid-19 pandemic effects in rural areas.**
Turning challenges into opportunities for rural regeneration
Claudia De Luca, Simona Tondelli, Hanna Elisabeth Åberg
- 133** **Shaping space for ever-changing mobility. Covid-19 lesson learned from Milan and its region**
Diego Deponte, Giovanna Fossa, Andrea Gorrini
- 151** **From social distancing to virtual connections**
How the surge of remote working could remold shared spaces
Luisa Errichiello, Daniele Demarco
- 165** **The paradigms of urban planning to emergency-proof.**
Rethinking the organisation of settlements at the time of a pandemic
Isidoro Fasolino, Michele Grimaldi, Francesca Coppola
- 179** **Virucity. Rethinking the urban system**
Romano Fistola, Dino Borri
- 189** **The role of the urban settlement system in the spread of Covid-19 pandemic. The Italian case**
Carmela Gargiulo, Federica Gaglione, Carmen Guida, Rocco Papa, Floriana Zucaro, Gerardo Carpentieri
- 213** ***“Passata è la tempesta ...”*. A land use planning vision for the Italian Mezzogiorno in the post pandemic**
Paolo La Greca, Francesco Martinico, Fausto Carmelo Nigrelli

- 231 Covid-19 and spatial planning**
A few issues concerning public policy
Sabrina Lai, Federica Leone, Corrado Zoppi
- 247 Take advantage of the black swan to improve the urban environment**
Antonio Leone, Pasquale Balena, Raffaele Pelorosso
- 261 Imagining living spaces in extreme conditions: suggestions from a case study in Bari**
Giulia Mastrodonato, Domenico Camarda
- 269 Risk, health system and urban project**
Gerardo Matteraglia
- 283 Geographical analyses of Covid-19's spreading contagion in the challenge of global health risks**
The role of urban and regional planning for risk containment
Beniamino Murgante, Ginevra Balletto, Giuseppe Borruso, Giuseppe Las Casas, Paolo Castiglia
- 305 The resilient city and adapting to the health emergency.**
Towards sustainable university mobility
Francesca Pirlone, Ilenia Spadaro
- 315 Physical spacing and spatial planning.**
New territorial geographies and renewed urban regeneration policies
Piergiuseppe Pontrandolfi
- 327 Mega cities facing Covid-19 pandemic.**
How to use urban spaces in Tehran after the new pandemic
Elmira Shirgir
- 333 Rethinking rules and social practices. The design of urban spaces in the post-Covid-19 lockdown**
Maria Rosaria Stufano Melone, Stefano Borgo
- 343 Data analysis and mapping for monitoring health risk. What has the spread of the Covid-19 pandemic in northern Italy taught us?**
Michela Tiboni, Michèle Pezzagno, David Vetturi, Craig Alexander, Francesco Botticini
- 363 About the Sustainability of Urban Settlements.**
A first reflection on the correlation between the spread of Covid-19 and the regional average population density in Italy
Maurizio Tira

Covid-19 and spatial planning

A few issues concerning public policy

Sabrina Lai^a, Federica Leone^b, Corrado Zoppi^{c*}

^a DICAAR - Department of Civil and Environmental Engineering and Architecture
University of Cagliari, Italy
e-mail: sabrinalai@unica.it

^b DICAAR - Department of Civil and Environmental Engineering and Architecture
University of Cagliari, Italy
e-mail: federicaleone@unica.it

^c DICAAR - Department of Civil and Environmental Engineering and Architecture
University of Cagliari, Italy
e-mail: zoppi@unica.it
ORCID: <https://orcid.org/0000-0003-4114-5380>

* Corresponding author

Abstract

This article analyzes some relevant questions as regards the impact of Covid-19-related social living conditions on spatial planning policies and practices. The proposed discussion aims at highlighting and assessing a number of outstanding topics of spatial planning which public administrative bodies, practitioners, entrepreneurs and organizations operating in the profit and non-profit sectors, and the local communities should carefully consider with reference to a new planning outset after the lockdown period. Innovative and creative approaches should be identified and implemented when dealing with collective public spaces and shopping malls, urban and regional mobility infrastructure and services, food-supply changes and their implications in terms of development of local food-producing practices, spatial social control and privacy, mitigation of climate change-related negative impacts, and public awareness and commitment towards losers, especially urban losers. Each of these items presents important challenges for the future of spatial planning. Some of these challenges are synthetically described and discussed in this article.

Keywords

Covid-19; Post-lockdown planning; Food self-sufficiency; Mobility; Climate change.

How to cite item in APA format:

Lai, S., Leone F., & Zoppi, C. (2020). Covid-19 and spatial planning. *Tema. Journal of Land Use, Mobility and Environment*, 231-246. <https://doi.org/10.6092/1970-9870/6846>

1. Introduction

After the lockdown time, new approaches, aimed at mitigating the Covid-19-related risk, will characterize spatial practices that will possibly challenge a number of commonplaces of the current planning culture. In this article a number of these planning clichés are discussed in the light of the Covid-19 pandemic impacts. In the second section the issue of collective spaces, such as outdoor public meeting spaces and shopping malls, is analyzed in a post-lockdown perspective, and the traditional role of these urban and regional service areas is questioned, on the basis of the new need for social distancing. The issue of spatial social control and privacy is also treated, building on these premises as well. Food-supply changes and their implications in terms of development of local food-producing practices and entailed productive uses of a part of the available urban public spaces is the topic of the third section, while the fourth deals with mobility infrastructure and services. The fifth section focuses on mitigation of climate change-related negative impacts. In the conclusion, a radical planning-inspired perspective (Marcuse, 2017; Friedmann, 1987) is assumed to address the issues of public awareness and commitment towards losers, especially urban losers, as regards the topics discussed in the article.

2. A new approach to collective spaces planning and social control

The International Council of Shopping Centers (ICSC) is a leading international organization funded by two Foundations based in the United States and Canada (ICSC Foundation and ICSC Canada), whose mission is “to ensure the retail real estate industry is broadly recognized for the integral role it plays in the social, civic and economic vibrancy of communities across the globe”¹. ICSC, which counts more than 70,000 affiliates throughout the world, identifies the following main social driver of shopping centers: “Retail real estate properties offer more than just financial profits — they’re a place to hang out after work, walk around with friends or family, and experience life offline. They enrich the social fabric of the places the world calls home”². Whether shopping centers were classified according to the taxonomy concerning the United States and Canada³ or Europe⁴, undoubtedly their main feature is represented by high concentrations of retailers and customers. Whether the shopping-oriented developments were located in the proximity or within the central business districts (CBDs), in peripheral contexts or in non-urbanized areas of the countryside, they often displaced small retailers, and, by doing so, eventually impoverished the livability of inner areas of cities and towns, whose urban fabrics have progressively lost their mixed-use characteristics, whose recovery should be identified as one of the most relevant points to implement effective policies of urban renewal (Mehanna & Mehanna, 2019; Grant & Perrott, 2010). Under this perspective, impoverishment and recovery are both based on the leading concept that livability is founded on concentration of people and retailers, which is precisely the point that has to be overturned in the ongoing post-lockdown period. The future of overcrowded shopping malls is seriously challenged. The newly-projected centers should be radically reconsidered, whereas the existing ones are at serious risk of becoming obsolete in the short run. The perspective of urban planning policies such as the approach proposed in the study by Mehanna and Mehanna (2019) should be overturned, since the call for increased attractiveness of inner cities and historical areas should give way to different measures, based on avoiding overcrowding of retail areas and on promoting a balanced distribution in terms of spatial location of retail activities across inner, peripheral and rural areas.

Newly-projected and existing outdoor public meeting spaces should be (re)planned on the basis of avoiding overcrowding as well. Systems of small- or medium-sized open spaces for outdoor activities such as sport and

¹ Quoted from ICSC’s, available at <https://www.icsc.com/who-we-are/our-mission>.

² *Ibid.*

³ Available from ICSC at <https://www.icsc.com/uploads/t07-subpage/US-Shopping-Center-Definition-Standard.pdf>

⁴ Available from ICSC at <https://www.icsc.org/uploads/t07-subpage/Europe-Shopping-Center-Definition-Standard.pdf>

leisure, recreation, biking, performances, exhibitions and political meetings, should be substitute for large-sized stadiums, arenas and entertainment venues. Concept master plans which entail new metropolitan or urban large stadiums, projected as multifunctional facilities attracting thousands of people, should be carefully reconsidered since social distancing may probably be inconsistent with the adopted planning concepts. From this point of view, the New South Wales Stadia Strategy (NSW Government, Office of Communities, 2012) and the new Cagliari stadium (Balletto & Borruso, 2019) are outstanding cases, among many, whose approaches should be redesigned in the light of the Covid-19 implications related to big outdoor facilities.

A connected issue concerns the decrease in safety of urban contexts as a consequence of the social distancing conditions which characterize the post-lockdown spatial organization. As per Jacobs (1961, p. 36), "[T]here must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street. The buildings on a street equipped to handle strangers and to insure the safety of both residents and strangers, must be oriented to the street. They cannot turn their backs or blank sides on it and leave it blind." Jacobs' position identifies the natural social control by the city users, be they inhabitants, retailers, customers, urban workers, mayors, entrepreneurs, civil servants or street artists, as a most desirable characteristic in terms of public safety and livability. The eyes upon the street are generated by a multiscalar sense of community, which the local society is built upon. The community space is shared by people who are heterogeneous as regards social group, ethnicity, religion, age, expectations, education level, working expertise and so on. All these people share the property of the public space, are used to each other and aware of the urban environment that they live in and they contribute to build and improve on a day by day social learning basis (Friedmann, 1987). In other words, in Jacobs' perspective, the eyes upon the street not only generate safety, but also create a warm sense of community which permeates and qualifies the urban livability.

Fundamental conditions which operationalize this control are mixed use of public space and high density of city users at different times during the day (Carmona, 2015). The integration of these conditions generates urban quality and neighborhood attractiveness (Kotkin, 2000), which have represented the reference points for the implementation of the urban renewal policies of several metropolises and medium- and small-sized cities all over the world (among many, Cysek-Pawlak, 2018; Aghamolaei, 2017; Vorontsova et al., 2016; Biddulph, 2003).

These conditions and reference points are seriously questioned by the relative isolation implied by a sustainable safe coexistence with Covid-19. Urban planning programs which aim at increasing the attractiveness of neighborhoods whose mixed-use implies the simultaneous presence of many city-users may possibly become obsolete, and local development policies based on cultural tourism are likely to be radically rescheduled. Congress business and cultural tourism which have had a leading position in the international urban order and in the outstanding role played by the central business and historical districts of several cities and metropolises (Short, 1996) are possibly going to be replaced by extensively-urbanized spatial contexts almost totally lacking in urban identity.

Several examples can be quoted in order to put in evidence how much the most livable and attractive environments generated by farsighted and effective implementation of planning policies can look inconsistent with respect to the future spatial contexts where people should keep a physical distance from each other and minimize social relations in the name of safety from Covid-19. What about the Fifth Avenue between the Empire State Building and Central Park, or Times Square and its surroundings (Birch, 1996), or the Bostonian North End (Jones et al., 2019)? Will the areas between Piazza della Signoria and Piazza del Duomo in Florence (Alberti & Paloscai, 2018), or from Piazza Duomo to Piazza San Babila in Milan (Bonfante & Pallini, 2014), be still attractive for tourists? Will the Ramblas in Barcelona (Urbano, 2015; Casellas, 2009), or the immense historic center of Rome (Clough Marinaro & Solimene, 2020; City of Rome, 2018; Coppola et al., 2014) still be operational as relevant factors for local and national economic and social development? Even though, at

present, future scenarios are difficult to imagine, it is hard to optimistically forecast a future new urban order based on radiant garden city beautiful-inspired planning approaches (Jacobs, 1961), and a probably long-lasting learning-by-doing period will characterize spatial policies and visions, aimed at dealing with a problematic coexistence with the Covid-19 dreadful threat.

3. Food-supply changes and their implications in terms of development of local food-producing practices

Travel restrictions and border controls have been enforced in a number of countries (Anzai et al., 2020; Cohen & Kupferschmidt, 2020; Kraemer et al., 2020, Wells et al., 2020) to prevent Covid-19 outbreaks or hinder the spread of the disease. Such restrictions, mostly aimed at limiting people's movements, have also hit freight shipping (Rahman et al., 2020), hence deeply affecting all kinds of supply chains, that is the networks of multiple firms (both producers and distributors) that make it possible to produce a specific good and distribute it until it reaches the final consumer (Mentzer et al., 2001). The way supply chains have been impacted by Covid-19 depends not only on possible shortages in the labor force (Galanakis, 2020; Hobbs, 2020; Shahidi, 2020) and on possible disruptions in the transport networks, but also, and critically, on the types of goods and products (Gray, 2020; Ivanov & Dolgui, 2020). In this respect, in the Covid-19 epidemic, food supply chains have been proving their vulnerability; the reasons for such fragility can be linked to a number of factors, two of which will be briefly looked at in this section: first, their reliance on the "just-in-time" approach; second, changes in types of food purchasing.

As for the first issue, it is worth remarking that the food supply chain, in an effort to increase efficiency, has steadily progressed in the recent past towards a "just-in-time" approach, where supermarket stocks are kept to a minimum and the system relies on continuous flows (Benton, 2020; Hobbs, 2020). This allows for increased speed in the goods' sales and, consequently, for reduction in the space and volume required to stock goods, as well as for more responsiveness in meeting possible changes in consumers' demands, hence minimizing the risk of not selling perishable goods. As a response to Covid-19 outbreaks, panic buying and stockpiling behavior, or food hoarding, have been observed in a number of countries (Deaton & Deaton, 2020; Galanakis, 2020). Two main drivers can be highlighted as the reasons for these behaviors: first, the fear that food would become unavailable, or that its price would increase to the extent that it would become unaffordable in the future (Power et al., 2020), mainly because of the low levels of stocked goods and high dependency of some markets on imported foods; second, the need to comply with social distancing and movement restrictions, also entailing the need to reduce the number of trips to supermarkets and grocery stores. However, in many a case, food shortages were either temporary or not as severe as the consumers had feared (Deaton & Deaton, 2020; Hobbs, 2020; Patricolo, 2020).

A second factor that has stressed the food chain is the change in consumers' demands, due to the fact that many people, especially tertiary sector workers, have been made to work from their homes, and that lockdown policies in force in some countries have entailed shutting down restaurants, cafes and the like. As a consequence, a number of workers, who had previously been used to having at least one meal per working day in their company's canteen, or in a restaurant or a café, have had to shift their eating habits by eating at home (Hobbs, 2020; Gray, 2020; Kolodinsky et al., 2020), either by resorting to online deliveries, or, most likely, by preparing their own meals. From the food chain perspective, this has implied an increase in food purchasing in supermarkets and groceries, possibly leading to queuing and temporary food shortages on the shelves, until the food market would readjust to meet the new demands.

Both changes in consumers' demands for food and adherence to the just-in-time-approach have resulted in major pressures on the food supply system, or, to put it with Power et al. (2020), in "testing food supply chains to their limits". In this respect, the major weakness exposed by Covid-19 in food chains is not the

primary production in itself (Shahidi, 2020), but the food transportation and distribution system. The more primary production areas are distant from consumption areas, the higher the food system's dependence on long-distance transportation, and the higher the exposure to the risk of international restrictions on movements of goods (Cappelli & Cini, 2020).

Hence, if strengthening the resilience of food chains is to be achieved, then one key strategy would be reducing the physical length of such chains, and shifting consumers' preferences to locally-produced food so as to achieve some sort of "regional self-sufficiency" (Deaton & Deaton, 2000). This would, in turn, increase local employment and therefore quality of life at the local level (Cappelli & Cini, 2020); moreover, promoting short food chains would also be beneficial on the nutritional side, as it could, in principle, alleviate the "food desert" problem (UN-Habitat & World Health Organization, 2020), i.e. the shortage of fresh food in low-income areas and the reliance on industrial (and heavily processed) food, which causes severe diet-related health problems and even mortality. Furthermore, by reducing the food mileage, a decrease in fuel consumption would be achieved, resulting in a lower carbon footprint and a lower impact on climate change.

However, one major barrier to achieving this shift to local products cannot be neglected, and it lies in the food prices, which are perceived, and often really are, higher than those of industrial foods. It might well be, then, that the worse-off urban dwellers who cannot afford to buy local foods would be the most affected by food chain disruptions, because more dependent on long-distance, or even on global, food networks. One possible way out, in such cases, could be a resurgence of subsistence urban agriculture, which could take two major forms: i., community gardens in public spaces, and, ii., rooftop farming.

"Community garden" is a generic term that in the literature encompasses various forms of farming in the urban environment (Firth et al., 2011); in its wider acceptance, the expression denotes collective farming in shared spaces, often (but not always) publicly owned and accessible. Urban dwellers resorted to community gardens to cope with food shortages during major crises, such as the Great Depression, or wartimes (Armstrong, 2000; Twiss et al., 2003). Later on, community gardens have been promoted by some municipalities because of the multiple benefits they provide: besides securing food and therefore allowing for money saving (Samuelsson et al., 2020), they help exercise, hence increasing people's (and especially the elderly's) health; moreover, they provide opportunities to foster local communities' social bonds, and they offer closeness to nature, as well as a peaceful and quiet environment away from urban traffic and noise (Schmelzkopf, 1995), which in turns contributes to improving people's psychological well-being. Therefore, community gardens can provide local communities with provisioning ecosystem services (food production), as well as with cultural ecosystem services (recreational and spiritual experiences). At the wider level, i.e., beyond that of the urban farmers who make direct use of the garden, they can support pollination and provide habitat for animal species; finally, depending on their characteristics, e.g. location, size, previous uses of public spaces being farmed, community gardens can also provide regulating services such as air purification, carbon sequestration, mitigation of the urban heat island effect, stormwater reduction. Notwithstanding, community gardens can be vulnerable to planning choices: when the demand for new development increases, or when land values are driven up, possibly also due to improvements in the neighborhood livelihood brought about by the community garden themselves (Armstrong, 2000), the land can be reallocated to more profitable land uses (Schmelzkopf, 2002), especially when urban agriculture takes place on private vacant lots rather than in public spaces. Therefore, land-use planning regulations should include specific provisions aiming at setting aside public spaces for this purpose.

Rooftop agriculture, as the name implies, takes place on buildings; because it spares land, it has also been labeled "Zero-Acreage Farming" (Thomaier et al., 2015). It includes both rooftop open-air farming, and rooftop greenhouses (Sanyé-Mengual et al., 2016), and, in developed countries, it can be either commercial or non-commercial. For commercial activities, green roofs are preferable; these consist of a number of layers,

including soil, filter, drainage, a barrier to protect the building, and should carefully be considered within the design of the building because of the significant weight addition. For non-commercial activities, simple pots and some scaffolding can be used to easily convert a terrace or balcony into a food garden (Sofo & Sofo, 2000). Prominent examples of cities already hosting large-scale vegetable farming on top of buildings are reported in the literature (see Walters & Midden, 2018); however, planning regulations concerning allowed land uses have been found to be a significant barrier to the spread of rooftop agriculture (Thomaier et al., 2015). Therefore, the inclusion of specific planning regulations, or policy guidelines, such as those issued in Boston and Chicago (Sanyé-Mengual et al., 2016) would be needed to favor the conversion of unused rooftops into vegetable gardens. As in the case of community gardens, benefits extend beyond farmers, since green rooftops, and rooftop gardens more in general, can deliver a number of regulating ecosystem services, such as mitigation of the urban heat island effect (Yinghui Astee & Kishnani, 2010), air purification, carbon sequestration and reduction in noise pollution (Rowe, 2011).

4. What future for mobility infrastructure and services?

The Covid-19 epidemic has deeply affected the transportation sector in general; passenger mobility has especially been hit because of travel restrictions, stay-at-home orders, closure of any business activities deemed as “non-necessary”. This, in turns, has brought about an unprecedented decrease in urban transport demand, both in car traffic and in public transport ridership (De Vos, 2020; Falchetta & Noussan, 2020). At the beginning of April 2020, Google launched its “Covid-19 Community Mobility Reports” (Google LLC, 2020) and the outcomes in the period April 3 - May 16 are staggering: in Italy, mobility trends’ figures for retail and recreation (which includes restaurants, shopping centers, movie theaters) are at -61%, and for public transport hubs at -53%; in the United Kingdom, the negative trend is worse (-74% and -58% respectively), and it gets even worse in Spain (-76% and -59, respectively), while in countries where a strict lockdown was not fully enforced the trends, although negative, are far from these values: the Netherlands, for instance, show -36% for retail and recreation and -46% for public transport hubs, while in Sweden the figures are at -19% and -26% respectively. These sheer numbers concerning public transport seem to support the view that this sector has suffered the greatest impacts (Schmidt, 2020) among the various modes of transportation, even in the absence of strict stay-at-home regulations.

On the one hand, people are showing reluctance to make use of public transport, which is perceived as a vector for the distribution of the virus (TUMI, 2020): public transport has been designed to allow large numbers of people to move together, hence full capacity has always been looked for, and this does not go hands in hands with physical distancing among passengers (Musselwhite et al., 2020); moreover, laboratory tests have suggested that, in the absence of proper sanitation measures, the virus can survive for a number of days on metal and plastic surfaces (van Doremalen et al., 2020) such as those of the vehicles, which also applies to shared mobility services. On the other hand, public transport cannot be shut down: not only do dense city centers depend on public transport for their functioning, especially in monofunctional CBDs and in any case in which a good mix of functions is lacking, but also many people depend on public transport to get to their working places, and especially the worse-off, those who cannot afford car ownership, and who are more likely to be employed in the so-called “essential jobs and services” (e.g. cleaning operators, grocery store employees, nurses) and less likely to be able to work from their homes.

What is yet to be known is how the transport system will recover, and which new equilibrium state it will achieve once the epidemic is over.

The first signals from places where gradual reopenings are taking place point at two main directions: first, fear of crowded spaces, or even of shared spaces, is persistent, which means that whoever owns an individual vehicle prefers to use it instead of riding a bus or a metro; second, public transport services are suffering not

only due to the fear of contagion, but also because they are struggling to meet additional requirements to increase both the passengers' and the drivers' safety. These include, for instance, lowering the vehicles' capacities, increasing the frequencies, implementing frequent cleaning and sanitation (Schmidt, 2020). All of this entails additional costs, all the more significant because coupled to the loss in revenues due to declining ridership (TUMI, 2020). As a consequence, there is an urgent need to rethink mobility, especially in urban areas. How this will be done depends on how the epidemic will evolve, and on how society will adapt to it. For instance, a possible scenario has been suggested in which whoever can, or is allowed to, will continue working from his/her home, which would sustain the current contraction in mobility demand (Falchetta & Noussan, 2020), although at the risk of increased social isolation (Batty, 2020).

There is general agreement on the fact that demand for private car travel will increase (Berk, 2020; O'Sullivan, 2020; Schmidt, 2020) because cars are perceived as a safer environment; such perception might offset perceived risks associated with car accidents, or the time spent searching for parking lots in city centers. As a consequence, city managers, transport planners and urban planners should aim to provide better, and safer, alternatives to mass use of cars, which would be undesirable because of its obvious side effects (such as congestion, car accidents, environmental pollution, use of fossil fuels) that would prevent governments from meeting the sustainable development goals (UNECE, 2020).

In the past years, public transport has been promoted as the most desirable and convenient mode of transport in compact cities. To maintain the advantages of metros and buses in face of current fears, some cities are experimenting, or are planning to experiment, new ways to manage public transport. Beijing, for instance, is planning to implement a new system whereby users would need to make an online reservation prior to boarding a subway, which would prevent having crowded vehicles and stations (TUMI, 2020), while Milan is introducing a system to control distances among passengers onboard buses and metro trains and to allow automatically closing the entrances of metro stations when needed (O'Sullivan, 2020). However, it has yet to be understood how, and where from, governments will get the large amounts of public funds that will be needed to make up for the decrease in capacity (and hence in revenues) and the additional costs due to cleaning and sanitation requirements.

Alternative modes of transportation have increased under the Covid-19 epidemic, when distance allows to do so; cities are witnessing a resurgence in scooters and bikes (Berk, 2020), as well as an increase in popularity of e-bikes and e-scooters. The main reason for this is that they are meant for individual use, hence, contrary to public transport, they ensure both physical distancing and low contacts with shared surfaces, if any. In New York, a ban on the use of e-scooters was lifted because of Covid (TUMI, 2020); moreover, some countries and cities are providing financial incentives to purchase micro-mobility devices (Caprino, 2020; Hawkins, 2020; Zipper & Westervelt, 2020), which is expected to further speed up the demand. Walking is another alternative mode of getting to places that has increased; as with cycling, this "active mobility" has partly happened as a response to closure of gyms and swimming pools, to do some sort of outdoor physical activity rather than attending online gym classes from home. This increase in active mobility is, indeed, something which should be maintained in the long run: urban walkability (Blečić et al., 2015) is closely linked to safety and attractiveness of places, hence it is a significant indicator of urban quality. However, if micro-mobility and walking are desired, then major rethinking of street infrastructure, and of the way the space is shared, will be needed; the way public space is designed should be rethought by reallocating or prioritizing some uses over others (NACTO, 2020), which is something that a number of cities have been doing since the beginning of the Covid-19 spread (e.g. Barcelona: Cols, 2020; Milan: O'Sullivan, 2020; Paris: Reid, 2020; Portland: Maus, 2020; Salt Lake City: Bennett, 2020). Supporting, or spurring, current demand for active mobility and micro-mobility will probably be the only way out, if compact cities want to survive the pandemic by keeping their livelihood and retaining the Covid's positive by-products, such as decrease in air pollution or reduction in road accidents,

without giving way to diffuse networks of small, low-density towns which would be perceived as a less risky as far as this epidemic, as well as the others which will inevitably follow, is concerned.

5. Mitigation of climate change-related negative impacts

The economic crisis caused by the Covid-19 pandemic has entailed some positive impacts on climate changes in terms of emissions reduction due to the restrictive measures carried out to guarantee social distancing by preventing virus diffusion.

The social and economic crisis due to Covid-19 pandemic has changed people's life patterns all over the world in relation to a number of aspects. One of the main implications, in terms of mitigation of climate change-related negative impacts, concerns the rapid decline in energy consumption, and CO₂ and greenhouse gases emissions. Indeed, at the international level demand for electricity supply has declined as a large share of users, belonging to the industrial, commercial and tertiary sectors, have had to slow down or to stop their activities. For example, according to a report of the Italian General Confederation of Enterprises, Professional Activities and Self-Employment (2020), in Italy, during April 2020, after a decrease of 30.1% in March, electricity consumption declined by 47.6% compared to the previous year. On the other hand, although the residential use of electricity increases, it does not compensate for the decline in industrial use. According to a study by McWilliams and Zachmann (2020), the daily electricity consumption during peak hours (08:00 – 18:00) in relation to the working days from 30th March to 3rd April declined by 34% in Italy, 18% in France, 24% in Spain and 20% in Austria in relation to the corresponding week in 2019.

In relation to emissions, several studies (Mahato et al., 2020; Dantas et al., 2020), published during the lockdown period, put in evidence the positive effects of forced restrictions on air quality of important megacities. Mahato et al. (2020) monitor seven pollutant parameters (PM₁₀, PM_{2.5}, SO₂, NO₂, CO, O₃ and NH₃) in relation to 34 monitoring stations located in Delhi, the capital city of India, and one of the largest megacities in the world. The study shows a significant declining trend of some pollutant concentrations, such as PM₁₀, PM_{2.5}, NO₂ and CO, whose average concentrations declined by -51.84%, -53.11%, -52.68% and -30.35% respectively. Emissions reduction is strictly connected with mobility. According to a study by Badii et al. (2020) on the lockdown effects on mobility, transport and the urban environment in Florence, during the first days of April and May 2020 the whole daily flow of vehicles entering and exiting from Florence decreased by 18% and 52%, respectively, in relation to the corresponding days of 2019.

However, the comprehensive impact the lockdown-related measures are likely to generate on climate changes is quite controversial. On the one hand, the emission reduction is temporary and its effects as regards the stock of greenhouse gases in the atmosphere seems marginal. On the other hand, in the post-lockdown period, many countries will mobilize financial resources to address the world economic crisis and, by doing so, they will support highly-polluting industrial sectors, such as aviation and motor industry. Moreover, facing the increase of debt-to-GDP ratio, caused by the huge tax support introduced within the economic system, will probably reduce green investments. Many resources aimed at financing green transition programs could be diverted to support economic recovery policies, as it is highly likely within the European Union countries (Catalano et al., 2020). Therefore, the impact generated by the world economic crisis on climate change in the post-lockdown period will be affected by public policies and strategies introduced by many developed countries' governments. Indeed, "reducing the world's greenhouse gas emissions depends on the aggregate effort of all countries [...] a single country cannot stabilize atmospheric concentrations of greenhouse gases all by itself—certainly not by reducing its emissions unilaterally [...] the contributions by individual countries to stabilizing concentrations do not matter [...]. Free riding is likely to be a much bigger problem for climate change mitigation." (Barrett, 2007, p. 6).

Moreover, the lockdown-related measures, such as closing shops and restaurants and smart-working practices, aimed at preventing social closeness in order to hinder the Covid-19 circulation, the so-called “social distancing” measures, produce important effects on people’s behaviors. During the lockdown period, travel demand and car traffic decreased at a significant rate, and, as a consequence, traffic congestion and air pollution went down (De Vos, 2020). During the post-lockdown period, people might prefer to use private cars in order to avoid contacts. Public transport might be perceived as a breeding ground for viruses (Troko et al., 2011) and therefore as a major source of Covid-19 diffusion. The likely increase in the use of private cars might entail negative effects on climate change mitigation. Policymakers and governments should encourage people to walk and to use bicycles as alternatives to private cars for short and medium range movements. However, many cities, e.g., most Southern Italy medium-sized cities, are not prepared to implement and manage cycling networks. In those cities, on the one hand the cycling network consists of small sections that do not connect to each other, and, on the other hand, the cycling paths are not safe, since they are not appropriately designed. According to King and Krizek (2020), walking and cycling activities should be encouraged by using little-used roadways as future pedestrian and cycling paths. Many cities around the world (Berlin, Philadelphia, and Mexico City) have experienced these policies (Laker, 2020). Furthermore, the use of public transport should be boosted by making buses and trains safer for commuters through redesigning and resetting their internal equipment in order not to reduce their capacity and to make them suitable to social contacts (De Vos, 2020).

Moreover, the restrictive measures implemented to prevent the Covid-19 diffusion have changed the habits of many citizens who are probably considering living in suburbs as an important alternative to CBDs, since in peripheral areas and in the country social distancing takes place much more easily (Cohen, 2020). This cultural change might encourage widespread urbanization at the expense of the compact city model, entailing more-or-less widespread land-taking processes and an increase in land surface temperatures. Indeed, as reported in a recent study (Lai et al., 2020), artificial urbanized areas and arable and permanent crops show the highest effects in terms of increase in land surface temperature. Moreover, the agricultural sector did not experience a significant reduction in emissions during the lockdown period (Helm, 2020). From this perspective, policy makers should promote and implement afforestation incentives in order to encourage the conversion from low-rent farming to forest farming (Lai et al., 2020). On the other hand, the optimal size of afforestation transitions and the ideal amount of financial resources to devote to these measures should be two central points in the political agenda (Zavalloni et al., in press). In addition, the direct commitment of local administrations to implement these measures, e.g. through direct purchase of private rural areas to convert into forest areas may convince local communities of the importance of mitigation of climate change-related negative impacts (Brouwer et al., 2015).

6. A radical planning-inspired conclusion

The spread of the Covid-19 disease has accelerated a generalized shift of white collars’ place of business from their company’s headquarters and premises towards their homes, since the work is organized on the basis of the smart-working mode. This approach will probably characterize private firms and public administrations not only in the very short term, but also in the medium and long run, since social distancing is one of the most outstanding features of the coexistence of Covid-19 and social life. This coexistence is not consistent with the pre-Covid-19 overcrowding of public collective transport, as per the discussion proposed in Section 4 of this article. Demand for office space is one of the main drivers of high density of city users in CBDs of cities and metropolises. Demand for office space generates, as a by-product, housing demand, and pushes up the real estate market towards gentrification (Leccis, 2019; Short, 1996). That being so, the decrease in office-space demand implied by the Covid-19 impact on real estate markets will probably entail a decline in the

attractiveness of previously-vibrant environments and, as a consequence, a fall in the funds availability for investment in the real estate market, such as urban renewal projects (Couch, 2008). On the other hand, smart-working practices, and the consequent increase in time spent at home by many previous users of the CBDs, will boost the relevance of the time spent in their residential areas by many workers, whose daily time allocated in commuting between home and their working places will be saved and utilized in more pleasant ways, thanks to cyber security and digital connectivity. In other words, the need to extend smart work to as many workers as possible, in order to increase social safety related to social distancing, has already sped-up and will progressively hasten the implementation of technological change into the local societies' everyday life based on widespread smart-working practices (Muggah & Ermacora, 2020).

A more balanced distribution of less-intensive residential, working and public service activities will probably drive the urban and periurban organizations towards a multicentered framework, where local communities will work as small villages, and the whole spatial context will be structured and planned as a network of villages (Magnaghi, 2000). The new city, conceived and organized as a network of villages, will be a chance and a challenge for present and future urban administrators and planners, since it will imply a new start in terms of mitigation and adaptation as regards climate change impacts, knowledge and protection of nature and natural resources (Lai et al., 2017), and increase in the availability of ecosystem services and green infrastructure (Magaudda et al., 2020). This situation will eventually entail a balanced and effective boost in urban resilience, which will be made possible by the novelty of a new-start condition (Muggah & Ermacora, 2020; Brunetta & Salata, 2019).

A new start, which builds upon urban resilience, implies public awareness and participation, implies "eyes upon the street" à la Jacobs (1961), or, eyes upon the planning process related to the project of the new network of villages. This position is strictly related to the radical planning tradition, which is vividly expressed by the following quotations:

- «As we have extracted it from the SM [social mobilization] tradition, radical planning is, like other forms of planning, concerned with the linkage of knowledge to action. Yet there is more than one way this linkage can be effected: planning for societal guidance is very different from planning for structural change and social transformation. It is this last which is of interest here» (Friedmann, 1987, p. 303);
- «It involves bringing out the hidden dimension of the alternatives underlying the one dimension of the actual. And then shaping the actual and realistic goal so that it points in the direction of the hidden dimension, the ultimately desirable [...]. I call this "transformative planning" and locate it, on the opening paradigm, between the social/liberal and the critical/radical» (Marcuse, 2017, pp. 45-46).

As per Friedmann, the ongoing overturn of the organization of the urban structure and its spatial development implies a continuous and effective social control and mobilization on behalf of the local societies, which should work as a network of villages. Local administrations, which will play a decisive role in the identification and implementation of the planning practices and measures of the new start, should be fully accountable to the public opinion, whose awareness and involvement in decision-making processes will be a necessary condition for their effectiveness. Planners should work as social mobilizers, that is as deliberative practitioners à la Forester (1999), willing and able to build new narratives, directly responsible to and for the whole local societies rather than to public bodies.

In the light of Marcuse's point of view, creative approaches to planning science and technique, which may entail relevant and sometimes radical changes in the ongoing paradigms, should be carefully taken into consideration by the public administrations, since transformations are likely to develop into important steps forward which could imply significant improvement in the quality of life and social welfare.

In the evidence of true change, in the post-lockdown period policy-makers, theorists and practitioners should implement new conceptual frameworks in order to integrate in the planning processes the theoretical and

technical implications related to the uprise of new social behaviors with reference to demand for housing, recreational and tourist closed and open spaces, mobility infrastructure, education and university services, agricultural and industrial areas. The preference for low-density and extensive urbanization, implied by social distancing, smart-working and balanced spatial distribution of activities, should drive towards innovative theoretical and technical visions concerning categories such as land take, soil sealing, intensive versus extensive urbanization, transportation networks, carbon capture and storage, and, ultimately, environmental, social and economic sustainability.

Author Contributions

The authors have jointly contributed to the paper's conception and design. Individual contributions are as follows: Corrado Zoppi wrote sections 2, and 6; Sabrina Lai wrote sections 3 and 4; Federica Leone wrote section 5.

References

- Aghamolaei, R. (2017). Urban renewal with a cultural approach. *Manzar. The Iranian Scientific Open Access Journal of Landscape*, 9(39), 38–47. https://www.manzarsj.com/?_action=showPDF&sc=1&article=57909&_ob=704c733bbb0a28c305669b86012331b3&fileName=full_text.pdf
- Alberti, F. & Paloscia, R. (2018). Florence and the river: new urban perspectives. *International Journal of Engineering & Technology*, 7(1.4), 47–53. <https://doi.org/10.14419/ijet.v7i1.4.9201>
- Anzai, A., Kobayashi, T., Linton, N.M., Kinoshita, R., Hayashi, K., Suzuki, A., Yang, Y., Jung, S., Miyama, T., Akhmetzhanov, A.R. & Nishiura, H. (2020). Assessing the impact of reduced travel on exportation dynamics of novel Coronavirus infection (COVID-19). *Journal of Clinical Medicine*, 9 (2, 601), 9 pp. <https://doi.org/10.3390/jcm9020601>
- Armstrong, D. (2000). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health & Place*, 6, 319–327. [https://doi.org/10.1016/S1353-8292\(00\)00013-7](https://doi.org/10.1016/S1353-8292(00)00013-7)
- Badii, C., Bellini, P., Bilotta, S., Bologna, D., Cenni, D., Difino, A., Ipsaro Palesi, A., Mitolo, N., Nesi, P., Pantaleo, G., Paoli, I., Paolucci, M. & Soderi, M. (2020). Impact on mobility and environmental data of COVID-19 lockdown on Florence Area. *Preprints*. <https://doi.org/10.20944/preprints202005.0184.v1>
- Balletto, G. & Borruso, G. (2019). Sport in the city. Football games without frontiers. The case of the Cagliari stadium. *Agribusiness Paesaggio & Ambiente*, 22(2), 121–128.
- Barrett, S. (2007). Introduction: the incentives to supply global public goods. In: Barrett, S. (2007) Why Cooperate?: The Incentive to Supply Global Public Goods. Retrieved from: <https://pdfs.semanticscholar.org/931a/7bb146f8f51c8d0e7681a5f8904ed325b14a.pdf>
- Batty, M. (2020). The Coronavirus crisis: What will the post-pandemic city look like? *Environment and Planning B: Urban Analytics and City Science*, 47(4), 547–552. <https://doi.org/10.1177/2399808320926912>
- Bennett, L. (2020). Salt Lake City converts street to pedestrian, bicycle traffic. Retrieved from: <https://www.ksl.com/article/46744288/salt-lake-city-converts-street-to-pedestrian-bicycle-traffic>
- Benton, T.G. (2020). COVID-19 and disruptions to food systems. *Agriculture and Human Values*. <https://doi.org/10.1007/s10460-020-10081-1>
- Berk, J. (2020). Getting creative with space to reopen our local economies. Retrieved from: <https://medium.com/placemakers/space-for-reopening-our-local-economies-eb4719bcc87a>
- Biddulph, M. (2003). The limitations of the urban village concept in neighborhood renewal: A Merseyside case study. *Urban Design International*, 8, 5–19. <https://doi.org/10.1057/palgrave.udi.9000090>
- Birch, E.L. (1996). Planning in a world city: New York and its communities. *Journal of the American Planning Association*, 62(4), 442–459. <https://doi.org/10.1080/01944369608975711>
- Blečić, I., Cecchini, A., Congiu, T., Fancello, G. & Trunfio, G.A. (2015). Evaluating walkability: a capability-wise planning and design support system. *International Journal of Geographical Information Science*, 29(8), 1350–1374. <https://doi.org/10.1080/13658816.2015.1026824>

- Bonfante, F. & Pallini, C. (2014). The role of a historic townscape in city reconstruction. In J. Pendlebury, E. Erten & P.J. Larkham, *Alternative visions of post-war reconstruction. Creating the modern townscape*, pp. 142-160, New York, NY, United States and London, United Kingdom: Routledge.
- Brouwer, R., Lienhoop, N. & Oosterhuis, F. (2015). Incentivizing afforestation agreements: Institutional-economic conditions and motivational drivers. *Journal of Forest Economics* 21(4), 205–222. <https://doi.org/10.1016/j.jfe.2015.09.003>
- Brunetta, G. & Salata, S. (2019). Mapping urban resilience for spatial planning—A first attempt to measure the vulnerability of the system. *Sustainability*, 11(8, 2331), 24 pp. <https://doi.org/10.3390/su11082331>
- Cappelli, A. & Cini, E. (2020). Will the COVID-19 pandemic make us reconsider the relevance of short food supply chains and local productions? *Trends in Food Science & Technology*, 99, 566–567. <https://doi.org/10.1016/j.tifs.2020.03.041>
- Caprino (2020). Ridotto il bonus bici: il contributo per l'acquisto si ferma al 60%. Mobilità elettrica in prima fila ai semafori Retrieved from: <https://www.ilsolare24ore.com/art/bonus-bici-e-monopattini-piste-ciclabili-light-e-pole-position-semafori-serviranno-davvero-ADK5OsP>
- Carmona, M. (2015). Re-theorising contemporary public space: a new narrative and a new normative. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 8(4), 373–405. <https://doi.org/10.1080/17549175.2014.909518>
- Casellas, A. (2009). Barcelona's urban landscape. The historical making of a tourist product. *Journal of Urban History*, 35(6), 815–832. <https://doi.org/10.1177/0096144209339557>
- Catalano, M., Forni, L. & Pezzolla, E. (2020). Che impatto avrà la pandemia Covid-19 sul climate change?. Retrieved from: <https://www.prometeia.it/atlante/che-impatto-avra-pandemia-covid-19-su-climate-change>
- City of Rome (2018). Rome resilience strategy. Rome, Italy: City of Rome. Retrieved from: <https://www.100resilientcities.org/wp-content/uploads/2018/06/Rome-Resilience-Strategy-ENG-PDF-2.pdf>
- Clough Marinaro, I. & Solimene, M. (2020). Navigating the (in)formal city: Roma, urban life and governance in Rome. *Cities*, 96 (102402), 6 pp. <https://doi.org/10.1016/j.cities.2019.102402>
- Cohen, S. (2020). Social distance, sustainable cities and building public health capacity. Retrieved from: <https://blogs.ei.columbia.edu/2020/04/20/social-distance-sustainable-cities-building-public-health-capacity/>
- Cohen, J. & Kupferschmidt, C. (2020). Strategies shift as coronavirus pandemic looms. *Science*, 367 (6481), 962–963. <https://doi.org/10.1126/science.367.6481.962>
- Coppola, P., Angiello, G., Carpentieri, G. & Papa, E. (2014). Urban form and sustainability: the case study of Rome. *Procedia: Social & Behavioral Sciences*, 160, 557–566. <http://doi.org/10.1016/j.sbspro.2014.12.169>
- Cols C. (2020). Barcelona ampliará aceras y carriles bici para minimizar los contagios. Retrieved from: <https://www.elperiodico.com/es/barcelona/20200425/barcelona-ampliara-aceras-y-carriles-bici-para-minimizar-los-contagios-covid-7940149>
- Couch, C. (2008). Urban regeneration in Liverpool. In C. Couch, C. Fraser & S. Percy (Eds.), *Urban regeneration in Europe*, pp. 34–54, Oxford, United Kingdom: John Wiley & Sons. <https://doi.org/10.1002/9780470690604.ch3>
- Cysek-Pawlak, M.M. (2018). Mixed use and diversity as a New Urbanism principle guiding the renewal of post-industrial districts. Case studies of the Paris Rive Gauche and the New Centre of Lodz. *Urban Development Issues*, 57(1), 53–62. <https://doi.org/10.2478/udi-2018-0017>
- Dantas, G., Siciliano, B., Boscaro França, B., da Silva, C.M. & Arbilla, G. (2020). The impact of COVID-19 partial lockdown on the air quality of the city of Rio de Janeiro, Brazil. *Science of the Total Environment*, 729, 139085. <https://doi.org/10.1016/j.scitotenv.2020.139085>
- De Vos, J. (2020). The effect of COVID-19 and subsequent social distancing on travel behavior. *Transportation Research Interdisciplinary Perspectives*, 5(100121). <http://dx.doi.org/10.1016/j.trip.2020.100121>
- Deaton, B.J. & Deaton, B.J. (2020). Food security and Canada's agricultural system challenged by COVID-19. *Canadian Journal of Agricultural Economy*. <https://doi.org/10.1111/cjag.12227>
- Firth, C., Maye, D. & Pearson D. (2011). Developing "community" in community gardens. *Local Environment*, 16(6), 555–568. <https://doi.org/10.1080/13549839.2011.586025>
- Falchetta, G. & Noussan, M. (2020). The Impact of COVID-19 on transport demand, modal choices, and sectoral energy consumption in Europe. IAEE Energy Forum, Special Issue 2020. Retrieved from: <https://www.iaee.org/documents/2020EnergyForumSI.pdf>
- Forester, J. (1999). *The deliberative practitioner*, Cambridge, MA, United States: MIT Press.

- Friedmann, J. (1987). *Planning in the public domain*, Princeton, NJ, United States: Princeton University Press.
- Galanakis C.M. (2020). The food systems in the era of the Coronavirus (COVID-19) Pandemic Crisis. *Foods*, 9, 523 (10 pp.). <https://doi.org/10.3390/foods9040523>
- Google LLC (2020). Google COVID-19 Community Mobility Reports. Retrieved from: <https://www.google.com/covid19/mobility/>
- Gray, R.S. (2020). Agriculture, transportation, and the COVID-19 crisis. *Canadian Journal of Agricultural Economy*. <https://doi.org/10.1111/cjag.12235>
- Grant, J. & Perott, K. (2010). Where is the café? The challenge of making retail uses viable in mixed-use suburban developments. *Urban Studies*, 48(1), 177–195. <https://doi.org/10.1177/0042098009360232>
- Hawkins, A.J. (2020). How the novel Coronavirus is speeding the scooter apocalypse. Retrieved from: <https://www.theverge.com/2020/5/13/21257307/electric-scooter-bikeshare-covid-19-bird-lime-uber-subsidies>
- Helm, D. (2020). The environmental impacts of the coronavirus. *Environmental and Resource Economics*, 76, 21–38. <https://doi.org/10.1007/s10640-020-00426-z>
- Hobbs, J.E. (2020). Food supply chains during the COVID-19 pandemic. *Canadian Journal of Agricultural Economy*. <https://doi.org/10.1111/cjag.12237>
- Italian General Confederation of Enterprises, Professional Activities and Self-Employment (Confcommercio) (2020). Congiuntura confcommercio. Pil mensile, ICC e Prezzi. Retrieved from: <https://www.confcommercio.it/documents/20126/2678762/Congiuntura+Confcommercio+%28CC%29+5-2020.pdf/a445f6fb-06ee-627f-15d7-a91b55dbbf1c?version=1.1&t=1589786288326>.
- Ivanov, D. & Dolgui, A. (2020). Viability of intertwined supply networks: extending the supply chain resilience angles towards survivability. A position paper motivated by COVID-19 outbreak. *International Journal of Production Research*, 58(10), 2904–2915. <https://doi.org/10.1080/00207543.2020.1750727>
- Jacobs, J. (1961). *The death and life of great American cities*, New York, NY, United States: Random House.
- Jones, C., Lee, J.Y. & Lee, T. (2019). Institutionalizing place: Materiality and meaning in Boston's North End. In P. Haack, J. Sieweke & L. Wessel (Eds.) *Microfoundations of Institutions*, Research in the Sociology of Organizations, Vol. 65B, pp. 211–239, Somerville, MA, United States: Emerald Publishing Limited. <https://doi.org/10.1108/S0733-558X2019000065B016>
- King, D.A., Krizek, K.J. (2020) The power of reforming streets to boost access for human scaled vehicles. *Transportation Research Part D: Transport and Environment*, 83, 102336. <https://doi.org/10.1016/j.trd.2020.102336>
- Kolodinsky, J., Sitaker, M., Chase, L., Smith, D. & Wang, W. (2020). Food systems disruptions: Turning a threat into an opportunity for local food systems. *Journal of Agriculture, Food Systems, and Community Development*, 9(3), 1–4. <https://doi.org/10.5304/jafscd.2020.093.013>
- Kotkin, J. (2000). *The new geography: how the digital revolution is reshaping the American landscape*, New York, NY, United States: Random House.
- Kraemer, M.U.G., Yang, C.H., Gutierrez, B., Wu, C.H., Klein, B., Pigott, D.M., Open COVID-19 Data Working Group, du Plessis, L., Faria, N.R., Li, R., Hanage, W.P., Brownstein, J.S., Layan, M., Vespignani, A., Tian, H., Dye, C., Pybus, O.G., Scarpino, S.V. (2020). The effect of human mobility and control measures on the COVID-19 epidemic in China. *Science*, 368(6490), 493–497. <https://doi.org/10.1126/science.abb4218>
- Lai, S., Leone, F. & Zoppi, C. (2017). Anthropization processes and protection of the environment: An assessment of land cover changes in Sardinia, Italy. *Sustainability*, 9(12, 2174), 19 pp. <https://doi.org/10.3390/su9122174>
- Lai, S., Leone, F. & Zoppi, C. (2020). Spatial distribution of surface temperature and land cover: A study concerning Sardinia, Italy. *Sustainability*, 12(8, 3186), 20 pp. <https://doi.org/10.3390/su12083186>
- Laker, L. (2020) World cities turn their streets over to walkers and cyclists. Retrieved from: <https://www.theguardian.com/world/2020/apr/11/world-cities-turn-their-streets-over-to-walkers-and-cyclists>
- Leccis, F. (2019). Regeneration programmes: Enforcing the right to housing or fostering gentrification? The example of Bankside in London. *Land Use Policy*, 89 (104217), 9 pp. <https://doi.org/10.1016/j.landusepol.2019.104217>
- Magaudda, S., D'Ascanio, R., Muccitelli, S. & Palazzo, A.L. (2020). 'Greening' green infrastructure. Good Italian practices for enhancing green infrastructure. *Sustainability*, 12(6, 2301), 22 pp. <https://doi.org/10.3390/su12062301>
- Magnaghi, A. (2000). *Il progetto locale*, Turin, Italy: Bollati-Boringhieri.

- Mahato, S., Pal, S. & Gopal Ghosh, K. (2020). Effect of lockdown amid COVID-19 pandemic on air quality of the megacity Delhi, India. *Science of the Total Environment*, 730, 139086. <https://doi.org/10.1016/j.scitotenv.2020.139086>
- Marcuse, P. (2017). From utopian and realistic to transformative planning. In B. Haselsberger (Ed.). *Encounters in planning thought. 16 Autobiographical essays from key thinkers in spatial planning*, pp. 35-50, New York, NY, United States and London, United Kingdom: Routledge.
- Maus, J. (2020). Portland launches 100-mile 'Slow Streets Safe Streets' COVID-19 response effort. Retrieved from: <https://bikeportland.org/2020/04/28/portland-launches-100-mile-slow-streets-safe-streets-covid-19-response-effort-314063>
- McWilliams, B. & Zachmann, G. (2020). Covid-19 crisis: electricity demand as a real-time indicator. Retrieved from: <https://www.bruegel.org/2020/03/covid-19-crisis-electricity-demand-as-a-real-time-indicator/>
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Wix, N., Smith, C.D., & Zacharia, Z.G. (2001). Defining supply chain management. *Journal of Business Logistics*, 22(2), 1–25. <https://doi.org/10.1002/j.2158-1592.2001.tb00001.x>
- Mehanna, Wa.A.El-H. & Mehanna, We.A.El-H. (2019). Urban renewal for traditional commercial streets at the historical centers of cities. *Alexandria Engineering Journal*, 58(4), 1127–1143. <https://doi.org/10.1016/j.aej.2019.09.015>
- Muggah, R. & Ermacora, T. (2020). Opinion: Redesigning the COVID-19 city. Special Series – The Coronavirus Crisis, NPR media organization. Retrieved from: <https://www.npr.org/2020/04/20/839418905/opinion-redesigning-the-covid-19-city?t=1587457589859>
- Musselwhite, C., Avineri, E. & Susilo, Y. (2020). Editorial JTH 16 –The Coronavirus disease COVID-19 and implications for transport and health. *Journal of Transport & Health*, 16 (100853). <https://doi.org/10.1016/j.jth.2020.100853>
- NACTO (2020). Streets for pandemic response & recovery. Retrieved from: https://nacto.org/wp-content/uploads/2020/05/NACTO_Streets-for-Pandemic-Response-and-Recovery_2020-05-21.pdf
- NSW Government, Office of Communities (2012). *Stadia strategy*, Sydney, Australia: NSW Government, Office of Communities - Retrieved from: https://sportandrecreation.nsw.gov.au/sites/default/files/nsw_stadia_strategy_2012_0.pdf
- O'Sullivan, F. (2020). Europe's cities are making less room for cars after Coronavirus. Retrieved from: <https://www.citylab.com/transportation/2020/04/coronavirus-reopen-cities-public-transit-car-free-bike-milan/610360/>
- Patricolo, C. (2020). How the car-centric lifestyle contributes to food shortages. Retrieved from: https://medium.com/@Among_The_Stars/how-the-car-centric-lifestyle-contributes-to-food-shortages-20856def2b56
- Power, M., Doherty, B., Pybus, K. & Pickett, K. (2020). How Covid-19 has exposed inequalities in the UK food system: The case of UK food and poverty. Version 2. *Emerald Open Research*, 2(11). <https://doi.org/10.35241/emeraldopenres.13539.1>
- Rahman, N.A.A., Rahim, S.A., Ahmad, M.F. & Hafizuddin-Syah, B.A.M. (2020). Exploring COVID-19 pandemic: Its impact to global aviation industry and the key strategy. *International Journal of Advanced Science and Technology*, 29 (6s), 1829–1836 - Retrieved from: <http://sersc.org/journals/index.php/IJAST/article/view/9344>
- Reid, C. (2020). Paris to create 650 kilometers of post-lockdown cycleways - Retrieved from: <https://www-forbes-com.cdn.ampproject.org/c/s/www.forbes.com/sites/carltonreid/2020/04/22/paris-to-create-650-kilometers-of-pop-up-corona-cycleways-for-post-lockdown-travel/amp/>
- Rowe, D.B. (2011). Green roofs as a means of pollution abatement. *Environmental Pollution*, 159(8-9), 2100–2110. <https://doi.org/10.1016/j.envpol.2010.10.029>
- Samuelsson, K., Barthel, S., Colding, J., Macassa G. & Giusti M. (2020). Urban nature as a source of resilience during social distancing amidst the Coronavirus pandemic. Retrieved from: <https://osf.io/3wx5a/>
- Sanyé-Mengual, E., Anguelovski, I., Oliver-Solà, J., Montero, J.I., Rieradevall, J. (2016). Resolving differing stakeholder perceptions of urban rooftop farming in Mediterranean cities: Promoting food production as a driver for innovative forms of urban agriculture. *Agriculture and Human Values*, 33, 101–120. <https://doi.org/10.1007/s10460-015-9594-y>
- Schmelzkopf, K. (1995). Urban community gardens as contested space. *Geographical Review*, 85(3), 364–381.
- Schmelzkopf, K. (2002). Incommensurability, land use, and the right to space: Community gardens in New York City, *Urban Geography*, 23(4), 323–343. <https://doi.org/10.2747/0272-3638.23.4.323>
- Schmidt, M. (2020). Impacts of COVID on urban transport. Preprint: <https://doi.org/10.13140/RG.2.2.29901.59362>
- Shahidi, F. (2020). Does COVID-19 affect food safety and security? A summary report on the extraordinary scientific roundtable of IUFOST-CIFST on March 21, 2020. Retrieved from: <http://www.isnff-jfb.com/index.php/JFB/article/view/125/216>

- Short, J.R. (1996). *The urban order: An introduction to cities, culture, and power*, Oxford, United Kingdom: Blackwell.
- Sofo, A. & Sofo, A. (2020). Converting home spaces into food gardens at the time of Covid-19 quarantine: All the benefits of plants in this difficult and unprecedented period. *Human Ecology*. <https://doi.org/10.1007/s10745-020-00150-8>
- Thomaier, S., Specht, K., Henckel, D., Dierich, A., Siebert, R., Freisinger, U. & Sawicka, M. (2015). Farming in and on urban buildings: Present practice and specific novelties of Zero-Acreage Farming (ZFarming). *Renewable Agriculture and Food Systems*, *30*(1), 43–54. <https://doi.org/10.1017/S1742170514000143>
- Troko, J., Myles, P., Gibson, J., Hashim, A., Enstone, J., Kingdon, S., Packham, C., Amin, S., Hayward, A., Nguyen Van-Tam, J. (2011). Is public transport a risk factor for acute respiratory infection? *BMC Infectious Diseases*, *11*(16). <https://doi.org/10.1186/1471-2334-11-16>
- Twiss, J., Dickinson, J., Duma, S., Kleinman, T., Paulsen, H. & Rilveria, L. (2003). Community gardens: Lessons learned from California healthy cities and communities. *American Journal of Public Health*, *93*, 1435–1438, <https://doi.org/10.2105/AJPH.93.9.1435>
- TUMI (2020). The COVID-19 outbreak and implications to sustainable urban mobility – some observations. Retrieved from: <https://www.transformative-mobility.org/news/the-covid-19-outbreak-and-implications-to-public-transport-some-observations>
- UN-Habitat & World Health Organization (2020). *Integrating health in urban and territorial planning: A sourcebook*. Geneva, Switzerland: UN-HABITAT and World Health Organization. Retrieved from: <https://www.who.int/publications-detail/integrating-health-in-urban-and-territorial-planning>
- UNECE (2020). Governments in Pan-European region launch UN Task Force to make post-COVID-19 pandemic mobility more environmentally sound, healthy and sustainable - Retrieved from: <https://www.unece.org/info/media/presscurrent-press-h/transport/2020/governments-in-pan-european-region-launch-un-task-force-to-make-post-covid-19-pandemic-mobility-more-environmentally-sound-healthy-and-sustainable/doc.html>
- Urbano, J. (2015). The Cerdà plan for the expansion of Barcelona: A model for modern city planning. *Focus. The Journal of Planning Practice and Education*, *12*(1), 47–51. <https://doi.org/10.15368/focus.2016v12n1.2>
- van Doremalen, N., Bushmaker, T., Morris, D.H., Hoolbrook, M.G., Gamble, A., Williamson, B.N., Tamin, A., Harcourt, J.L., Thornburg, N.J., Gerber, S.I., Lloyd-Smith, J.O., de Wit, E. & Munster, V.J. (2020). Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *The New England Journal of Medicine*, *382*, 1564–1567. <https://doi.org/10.1056/NEJMc2004973>
- Vorontsova A.V., Vorontsova V.L. & Salimgareev D.V. (2016). The development of urban areas and spaces with the mixed functional use. *Procedia Engineering*, *150*, 1996–2000. <https://doi.org/10.1016/j.proeng.2016.07.277>
- Walters, A. & Midden, K.S. (2018). Sustainability of urban agriculture: Vegetable production on green roofs. *Agriculture*, *8*(11, 168), 16 pp. <https://doi.org/10.3390/agriculture8110168>
- Wells, C.R., Sah, P., Moghadas, S.M., Pandey, A., Shoukat, A. Wang, Y., Wang, Z., Meyers, L.S., Singer, B.H. & Galvani, A.P. (2020). Impact of international travel and border control measures on the global spread of the novel 2019 Coronavirus outbreak. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(13), 7504–7509. <https://doi.org/10.1073/pnas.2002616117>
- Yinghui Astee, L. & Kishnani, N.T. (2010). Building integrated agriculture: Utilising rooftops for sustainable food crop cultivation in Singapore. *Journal of Green Building*, *5*(2), 105–113. <https://doi.org/10.3992/jgb.5.2.105>
- Zavalloni, M., D'Alberto, R., Raggi, M. & Viaggi, D. (in press). Farmland abandonment, public goods and the CAP in a marginal area of Italy. *Land Use Policy*. <https://doi.org/10.1016/j.landusepol.2019.104365>
- Zipper, D. & Westervelt, M. (2020). Anyone feel like saving electric scooters? Retrieved from: <https://www.citylab.com/perspective/2020/04/electric-scooters-coronavirus-bird-lime-bikesharing/610060/>

Authors' profiles

Sabrina Lai

Sabrina Lai is a civil engineer, a Doctor of Research in Land Engineering (Italy, 2009), and an MSc in International Planning and Development (UK, 2008). She is an Assistant Professor at the University of Cagliari (Sector ICAR/20 – Spatial planning), where she is presently teaching at the Department of Civil and Environmental Engineering and Architecture of the University of Cagliari in the Graduate Program in Environmental and Territorial Engineering (module leader for the Strategic Planning course).

Federica Leone

Federica Leone is a building engineer, a Doctor of Research in Land Engineering (Italy, 2013), and an MSc in International Planning and Development (UK, 2012). She is currently a research fellow at the Department of Civil and Environmental Engineering and Architecture of the University of Cagliari.

Corrado Zoppi

Corrado Zoppi is a civil engineer, a Doctor of Philosophy in Economics (USA, 1997), a Doctor of Research in Territorial Planning (Italy, 1992), and an MSc in Economic Policy and Planning (USA, 1990). He is a Professor at the University of Cagliari (Sector ICAR/20 – Spatial planning). He is presently teaching at the Department of Civil and Environmental Engineering and Architecture of the University of Cagliari in the Undergraduate and Graduate Programs in Environmental and Territorial Engineering and in Sustainable Tourism Management and Monitoring (Regional and Urban Planning, Strategic Planning and Environmental planning).