

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.

TeMA is the Journal of Land Use, Mobility and Environment and 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.



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

Vol.14 n.2 August 2021

print ISSN 1970-9889 e-ISSN 1970-9870
University of Naples Federico II

TeMA

Journal of
Land Use, Mobility and Environment

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

2 (2021)

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 | online 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

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)

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 transport, land use 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 4.0 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
Pierluigi Coppola, Politecnico di Milano, Italy
Derrick De Kerckhove, University of Toronto, Canada
Mark Deakin, Edinburgh Napier University, Scotland
Carmela Gargiulo, University of Naples Federico II, Italy
Aharon Kellerman, University of Haifa, Israel
Nicos Komninos, Aristotle University of Thessaloniki, Greece
David Matthew Levinson, University of Minnesota, USA
Paolo Malanima, Magna Graecia 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
Luigi dell'Olio, University of Cantabria, Spain
Isidoro Fasolino, University of Salerno, Italy
Romano Fistola, University of Sannio, Italy
Thomas Hartmann, Utrecht University, Netherlands
Markus Hesse, University of Luxembourg, Luxembourg
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
Sabrina Sgambati, Ph.D. student at University of Naples Federico II, Italy

TeMA

Journal of
Land Use, Mobility and Environment

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

2 (2021)

Contents

121 EDITORIAL PREFACE
Rocco Papa

FOCUS

125 **Metropolitan Cities supporting local adaptation processes. The case of the Metropolitan City of Venice**
Filippo Magni, Giovanni Litt, Giovanni Carraretto

145 The article “The application of green and blue infrastructure impact of city borders and ecosystem edges impact”, pages 145-160, was withdrawn for the authors’ request.

LUME (Land Use, Mobility and Environment)

161 **Territorial disparities in Tuscan industrial assets: a model to assess agglomeration and exposure patterns**
Diego Altafini, Valerio Cutini

177 **Estimation of the future land cover using CORINE Land Cover data**
Gizem Dinç, Atila Gül

189 **Quantifying the urban built environment for travel behaviour studies**
Ndidi Felix Nkeki, Monday Ohi Asikhia

Covid-19 vs City-21

211 Covid-19 pandemic and activity patterns in Milan. Wi-Fi sensors and location-based data

Andrea Gorrini, Federico Messa, Giulia Ceccarelli, Rawad Choubassi

227 Former military sites and post-Covid-19 city in Italy. May their reuse mitigate the pandemic impacts?

Federico Camerin

245 Investigation of the effects of urban density on pandemic

Yelda Mert

EVERGREEN

261 Chaos and chaos: the city as a complex phenomenon

Carmela Gargiulo, Rocco Papa

REVIEW NOTES

271 Ecological transition: perspectives from U.S. and European cities

Carmen Guida, Jorge Ugan

279 Resilience as an urban strategy: the role of green interventions in recovery plans

Federica Gaglione, David Ania Ayiine-Etogo

285 Toward greener and pandemic-proof cities: policy responses to Covid-19 outbreak in four global cities

Gennaro Angiello

293 Environmental, social and economic sustainability in urban areas: a cool materials' perspective

Federica Rosso, Stefano Franco

TeMA 2 (2021) 271-277
print ISSN 1970-9889, e-ISSN 1970-9870
DOI: 10.6092/1970-9870/8056
Received 26th June 2021, Available online 31st August 2021

Licensed under the Creative Commons Attribution – Non Commercial License 4.0
www.tema.unina.it

REVIEW NOTES – Urban planning literature review

Ecological transition: perspectives from U.S. and European cities

Carmen Guida ^{a*}, Jorge Ugan ^b

^a Department of Civil, Building and Architectural Engineering
University of Naples Federico II, Naples, Italy
e-mail: carmen.guida@unina.it
ORCID: <https://orcid.org/0000-0002-8379-7793>
* Corresponding author

^b Department of Civil, Environmental, and Construction Engineering,
University of Central Florida, Orlando, FL, United States
e-mail: jorgeugan@Knights.ucf.edu
ORCID: <https://orcid.org/0000-0002-0830-0791>

Abstract

Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always remaining in the groove of rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of a continuous updating of emerging topics concerning relationships between urban planning, mobility and environment, through a collection of short scientific papers written by young researchers. 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 planning literature review section aims at presenting recent books and journals, within global scientific panorama, on selected topics and issues.

This contribution proposes a further insight into the complex ecological transition, with a focus to U.S. and European cities. Cities have faced a worldwide health and economic crisis due to the outbreak of a new coronavirus in 2019 and now, with progressive and massive vaccination and never experienced financial tools, a new era seems to start: significant financial resources, plenty of room for economic maneuvers may turn the ongoing pandemic into an opportunity, for the following years, to build more sustainable societies and environments. Within this scenario, urban areas play an essential role. According to shared and universal goals to achieve a more sustainable model of society and economy, how ecological transition is run by policymakers, stakeholders and citizens strongly depends on cities' backgrounds and structures.

Keywords

Ecological transition; Urban planning; Strategies.

How to cite item in APA format

Guida, C. & Ugan, J. (2021). Ecological transition: perspectives from U.S. and European cities. *Tema. Journal of Land Use, Mobility and Environment*, 14 (2), 271-277. <http://dx.doi.org/10.6092/1970-9870/8056>

1 Introduction

When it comes to well-being and health, the Covid-19 pandemic is undoubtedly a priority issue in policymakers agendas worldwide. The outbreak of a new coronavirus has required health protection responses with far-reaching consequences for society, livelihoods, and the broader economy. Future enquiries will eventually evaluate the success of responses at all scales, from restrictive policies to economic and financial support, for families and enterprises, from healthcare management to massive vaccination plans. Thus, emerging lessons highlight immediate implications for addressing the growing climate crisis through a recovery from Covid-19 that advances population health, economic regeneration and climate action (Śleszyński, 2020; Laurent, 2021). This contribution proposes a further insight into the complex ecological transition, with a focus to U.S. and European cities. Cities have faced a worldwide health and economic crisis due to the outbreak of a new coronavirus in 2019 and now, with progressive and massive vaccination and never experienced financial tools, a new era seems to start: significant financial resources, plenty of room for economic maneuvers may turn the ongoing pandemic into an opportunity, for the following years, to build more sustainable societies and environments. Within this scenario, urban areas play an essential role. According to shared and universal goals to achieve a more sustainable model of society and economy, how ecological transition is run by policymakers, stakeholders and citizens strongly depends on cities' backgrounds and structures (Meng et al., 2021).

As highlighted in the recent Global Risks Report of the World Economic Forum (2021), extreme weather, climate action failure and human environmental damage are expected to be the three most dangerous risks by likelihood. At the same time, for what concerns their impacts, according to a survey, infectious diseases seem to warn people the most. Moreover, the economic and social crises have broken globally financial dogmas. This significant step is allowing policymakers to manage wide-ranging and innovative financial maneuvers. Hopefully, new generations of professionals, academics and entrepreneurs will experience a *Renaissance* of economies that will embrace effective and sustainable climate actions (Gao et al., 2020).

Environmental and energy transitions are iterative processes of build-up and breakdown over a period of decades. In a transition model, change agents – for example pioneering regions and cities – start to experiment with ideas, technologies and practices towards a climate-neutral and circular economy. Over time, pressure to transform current socio-ecological systems (e.g. the current food system) builds up. Such pressure destabilises the current production and consumption system and creates space for alternatives to emerge, e.g. more sustainable food production systems. Change agents operate in parallel to so-called incumbents – actors (e.g. enterprises) that profit from the current, potentially unsustainable model. Incumbents can (and often do) prevent the successful emergence of new business models and institutional structures, such as renewable sources of electricity, cleaner fuels for mobility or more sustainable agricultural practices. During the process, elements of the old structure(s) that do not transform are broken down and phased out. The actual transition is chaotic and disruptive, and eventually leads to changed socio-economic systems, such as a sustainable food system or a sustainable energy system. Within this framework, cities are where many of the most critical actions for health, greenhouse gas (GHG) emissions reduction, resilience and risk reduction must be taken, supported by national governments, multi-lateral agencies, and other stakeholders. Rapid decarbonization across all sectors of society is needed over this decade: further delay will seriously reduce the possibility of achieving the targets set out in the Paris Agreement. Now is therefore an especially important juncture for cities to act for both the near-term imperatives of the post-Covid recovery and the long-term welfare of their residents and of the whole planet (Borkowski et al., 2021). From a design perspective, cities are in a unique position when it comes to climate change. Among the largest sources of emissions globally, they are also highly vulnerable to its consequences. According the most recent IPCC report (2019), 70% of cities worldwide are already dealing with the effects of climate change, and nearly all cities face some kind of risk. But they are also potentially powerful agents of change (Schmidt et al., 2021). As highlighted in the previous Urban Planning Literature Section of Review Notes, ecological transition to more sustainable models is needed, but

many and complex cause-effect reactions need to be taken into account. Policy at the national level has moved painfully slow in most countries, but urban areas have the authority to make meaningful changes in land use and zoning, green space, energy policy and transportation. Sustainable mobility and transportation solutions are the focus of this contribution, with a deeper insight into European and U.S. post-Covid-19 cities.

2 Ecological transition through mobility solutions

Mobility is an essential part of everyday day life and affects the wellbeing of citizens. Alongside with transport, mobility is the backbone of the well-functioning of national and international markets, fair competition and of utmost importance for socioeconomic and territorial cohesion, as well as for ensuring accessibility and connectivity, within urban areas and from rural zones to cities. It concerns all of us and we therefore have a responsibility to make sure that sustainable, high-quality transport is available with no one left behind. This requires that all transport policies take into account different social dimensions of underrepresentation, such as age, gender, socio-economic status or background, health, (dis)ability status, language barrier, employment situation or the region we live in. While this sector is crucial for the development of any economy, it also has a large role to play in any meaningful efforts to ecological transition to a low- carbon future. Therefore, it is necessary to view the transportation sector through the lens of sustainability, which encompasses economically viability, as well as human and environmental health. In Europe, mobility has a significant ecological footprint, being responsible for over 27% of all greenhouse gas emissions in the EU. While the EUs overall emissions decreased between 1990 and 2019, transport in the only sector whose emissions increased. Moreover, mobility is a major contributor to air pollution by emitting particulate matters and numbers. As outlined in the European Commissions' Green Deal, the sector needs to cut 90% of its emissions by 2050 and is therefore key for the EU to achieve climate neutrality in 2050 as set out in the European Climate Law (Gargiulo et al., 2012). Moreover, the sector needs to undergo a thorough digitalisation process on all levels to embrace the future, which will lead to profound changes in the sector and ensure competitiveness and efficiency, while also providing new opportunities. Even though European and U.S. cities have been characterized by different development models, which have led to compact European cities and American metropolis, their trends in GHG emissions in transportation sector seems to be close. From United States perspective, the transportation sector is one of the largest contributors to anthropogenic greenhouse gas emissions. According to the Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 - 2019 (the national inventory that the U.S. prepares annually under the United Nations Framework Convention on Climate Change), transportation accounted for the largest portion (29%) of total U.S. GHG emissions in 2019 (EPA, 2020). Cars, trucks, commercial aircraft, and railroads, among other sources, all contribute to transportation end-use sector emissions. Since United States President Joe Biden has moved to reinstate the U.S. to the Paris climate agreement just few hours after being sworn in as president, his administration is rolling out a cavalcade of executive orders aimed at tackling the climate crisis. This political and institutional effort signs for a greater commitment: scientists and researchers agree that, without U.S. engagement in Paris agreement, the already controversial and complex efforts of nations will be in vain. In the light (and hope) of the new era post-Covid, and renewed commitments towards climate crisis, innovative strategies are being delved into, promoting new forms of transport and society: electric and autonomous vehicles, shared mobility are some of the solutions that stakeholders and policymakers have to consider. Of course, Covid-19 restrictions and smart-working policies have deeply modified urban dynamics, that needs to be taken into account. Hence, in this contribution three significant studies are presented: they offer three different perspective to analyze the topic here discussed. The first (Nouvellet, 2021) one considers mobility and its relation to Covid-19: as data have proved, urban environments have been the epicentres for the transmission of the new coronavirus, but this research investigates about the actual responsibility of mobility trends in cities. In the second box, a book edited by Capasso and Canitano (2020) offers interesting insight to Mediterranean economies and society, through the

lens of mobility opportunities. The third (Badr et al., 2020) review concerns an in-depth focus to U.S. cities in the Covid-19 scenario.

Reduction in mobility and Covid-19 transmission



Authors/Editors: Pierre Nouvellet
 Publisher: Nature Communications
 Publication year: 2021
 DOI: 10.1038/s41467-021-21358-2

In response to the Covid-19 pandemic, countries have sought to control the transmission by restricting population movement through social distancing interventions. As mentioned before mobility data represents an important proxy measure of social distancing. The study characterizes the relationship between transmission and mobility for 52 countries around the world. Transmission significantly decreased with the initial reduction in mobility in 73% of the countries analyzed, but the study has found evidence of decoupling of transmission and mobility following the relaxation of strict control measures for 80% of countries. For the majority of countries, mobility explained a substantial proportion of the variation in transmissibility. In countries with a clear relationship between mobility and transmission both before and after strict control measures were relaxed, mobility was associated with lower transmission rates after control measures were relaxed indicating that the beneficial effects of ongoing social distancing behaviors were substantial. The study analyzed 52 countries for which both epidemiological and mobility data were available. This included 36 countries for which we had both Google and Apple mobility data and 16 countries for which we had only Google mobility data. The median mobility across the 52 countries reached its minimum on the 11th of March 2020, with a reduction of 63% from baseline. Mobility then recovered, with an estimated median reduction in mobility on the 25th of October 2020 reaching 14% from baseline. The 10 countries with the smallest changes saw mobility reduction within a range of 37 to 51% from baseline (smallest to largest changes observed in Moldova, Afghanistan, Switzerland, Ecuador, Paraguay, Sweden, Ukraine, Panama, Dominican Republic and Denmark). The 10 countries with the largest changes saw mobility reduction within a range of 72 to 83% from baseline (smallest to largest changes observed in Honduras, Poland, Costa Rica, Italy, Guatemala, Peru, Philippines, Argentina, France, Bolivia). The study found consistent evidence that automated measures of mobility correlate well with transmission intensity of Covid-19 over time in several countries. The relationship holds for 12 mobility data-streams based on Apple and Google mobility data and was robust to assumptions about the likelihood and serial interval distribution. The study also found strong evidence that the relationship between mobility and transmissibility changed over time, typically, a dampening indicating that smaller reductions in mobility can result in epidemic control likely due to other social distancing behaviors. As mobility data increasingly become available in real-time future epidemiological analysis may increasingly rely on this type of data. The study concluded that for the 52 countries having experienced, or still experiencing, substantial active Covid-19 transmission, there was a strong link between mobility measures and transmissibility, supporting the implementation of population-wide social distancing interventions to control the epidemic. Encouragingly, in the majority of countries, the study found clear evidence of a recent dampening of the relationship between transmission and mobility, suggesting alternative control strategies have been successfully implemented and significantly decreased transmission. This, however, was insufficient to prevent a second wave of infection in many countries as mobility, and thus contact rates, gradually increased. Mobility measures seem to reflect the level of contact and therefore level of transmission well. As such measures could be made available in real-time, mobility data could become an important aspect of forecasting efforts. An earlier version (May 2020) of this analysis explored such aspects, but the change in relationship demonstrated here means that more needs to be understood about additional drivers of transmission before reliable forecasting based on mobility can be achieved.

Mediterranean Economies 2020



Authors/Editors: Salvatore Capasso, Giovanni Canitano
 Publisher: il Mulino
 Publication year: 2020
 ISBN: 978-88-15-29082-3

The report on Mediterranean Economies presents an updated summary of the socio-economic research conducted by the Institute for Studies on the Mediterranean (ISMED) of the National Research Council (CNR). The report has been

published since 2003 and has an annual frequency. In recent years, international economic relations and political conditions in the South-Eastern Mediterranean countries have been changing. In this context of major change, the objectives and instruments of the European Mediterranean policy need to be reconsidered, in order to gather together elements useful for strengthening it and suggesting new orientations. A relaunching of cooperation strategies between the banks of the basin requires a good knowledge of the structural characteristics and political and economic dynamics of the economies of the southern and eastern shores of the basin. The report aims to respond to a demand for knowledge of these dynamics, which comes from economic and institutional actors and which is also reflected in the university and postgraduate training offer, which often identifies the Mediterranean as a case study representative of relations between the North and South of the world. The Mediterranean is a very integrated space within it, as the data on interchange and logistics show in a clear way, but it also presents all the critical aspects of an inhomogeneous space in which countries with deep economic inequalities, various indicators of human development, processes of democratization in progress and the results still uncertain and conflicts never dormant that feed a perennial state of political instability enter into contact. Therefore, while maintaining its character as a permanent observatory on the Mediterranean Economies, it is hoped that the report will gradually open up to political-institutional issues, instruments of analysis essential for reading an international scenario in which geopolitical and geoeconomic dynamics have a decisive influence on global economic growth. The reflection on the future of cooperation on the need for a rethinking of Euro-Mediterranean policies, which also emerges from the most recent community programmes such as Horizon 2020, stems from the awareness that global economic instability requires the search for regional responses, since the negative repercussions of the crisis on national markets and the need to build new development paths based on the strengthening of intergovernmental cooperation are evident. The report on the Mediterranean economies is intended to represent an original publication compared to other research products in Italy. These relations are characterized by an exclusively political focus, analysis of Euro-Mediterranean relations and identification of foreign policy strategies to manage emergency situations (control of political instability outbreaks, management of migration flows) or solely for the economic cutback, to support companies interested in investing in SEMCs. The ISMed report would like to place itself at the intersection of these two different disciplinary approaches, a product of research and reflection able to make politics interact with the economy. Moreover, the report does not only aim to update the state of the various areas of economic interest examined, but also to propose interpretative lines, present facts and figures, giving them a reading capable of capturing the current trends. The report aims to be an observatory on the dynamics of socio-economic cooperation in the Euro-Mediterranean context, analysed in their fundamental aspects (population, trade, foreign investment, environment, etc...) and focused on Euro-Mediterranean relations and interdependencies that are manifested between the three shores of the basin. The report could be of great usefulness to give a new impetus to the politics of Italy in the Mediterranean, which loses commercial positions on the southern and eastern shores of the basin to the advantage of non-EU European powers, such as Germany, and sees its logistical centrality diminished, with the downgrading of Italian ports increasingly exposed to competition from other Mediterranean and South-Mediterranean European airports. The need that Europe has to manage complex phenomena, such as migratory pressure, the presence of old conflicts that have never been resolved on the south-eastern shore of the basin (the Arab-Israeli conflict, the continuous inter-ethnic tensions in Lebanon) and new civil wars in Libya and Syria, the request for asylum of populations in a state of war, imposes a change of course and requires the overcoming of a Mediterranean seen from the North. Only from a cross-referenced look at the Mediterranean societies analysed in their mutual interdependence, can a common strategy emerge that values convergences of political objectives and economic complementarities.

Association between mobility patterns and Covid-19 transmission in the USA: a mathematical modelling study



Authors: Hamada S Badr, Hongru Du, Maximilian Marshall, Ensheng Dong, Marietta M Squire, Lauren M Gardner
 Publisher: Elsevier
 Publication year: 2020
 DOI: 10.1016/S1473-3099(20)30553-3

The Covid-19 pandemic has caused great global disruption with immense economic, environmental, and social impacts throughout the world. The alarming speed of this pandemic has caused millions to be infected and has brought economic activity to a near-standstill as countries imposed tight restrictions on movement to halt the spread of the virus. As the health and human toll rises, the economic damage is already evident and represents the largest economic shock the world has experienced in decades. Unfortunately, we can expect other major disruptions to occur in the future. The intent of this review is to understand the lessons for transportation engineering, which can be learned from the current catastrophe in hopes to better prepare us for future disruptions. The aspects of the pandemic not directly related to transportation, such as development of treatments, test, and vaccines will be ignored.

This study considers the relationship between the emerging dynamics of Covid-19 transmission and mobility in the United States. It looks into several publications that address this issue from a robust, data-driven perspective. The results found

are consistent with Covid-19 transmission research to date. Specifically, that decreased mobility has a significant, positive relationship with reduced case growth. Previous studies have shown that social distancing has positive effects on Covid-19 transmission in China, the work this study extends these results to the United States. The study uses real-world mobility data and reported case counts to empirically estimate the relationship between the two variables in the United States, instead of assumed infection rates, assumed compliance aligned with timing of policies, or modelled or synthetic data. The study concluded that social distancing helps reduce the spread of Covid-19, and should remain part of personal and institutional responses to the pandemic. To quantify the amount of social distancing in each US county, the study defined a mobility ratio for each day and county, which quantified the change in mobility patterns as a proxy for social distancing. The mobility reflects the change in the number of individual trips made in each county per day, relative to ordinary behavioral patterns (i.e., before Covid-19). To compute this measure, the study used daily origin–destination trip matrices at the US county level derived from aggregated and anonymized cell phone, using of aggregated mobility data to monitor the effectiveness of social distancing interventions. The mobility ratio is the sum of the total trips incoming, outgoing, and within each county on a given day, divided by the same measure on a baseline day. This metric is interpreted as a proxy for social distancing on the basis of the assumption that when individuals make fewer trips, they physically interact less. The mobility ratio for the 25 counties with highest number of reported cases at the time of the study ranged from 0.35 in New York City to 0.63 in Harris County, TX, highlighting the varying mobility ratio measures and associated behavioral changes around the country. The statistical analysis revealed that the effect of social distancing on decreasing transmission is not likely to be perceptible for at least 9–12 days after implementation, and might be longer. This lag time reflects the time for symptoms to manifest after infection, worsen, and be reported. The researchers we hope that the results will motivate both individuals and governments to make safe and data-driven decisions, and acknowledge the effect these choices have on all of our communities.

Author Contributions

The work, although the result of a common reflection, was divided as follows: Carmen Guida, paragraphs 1 and 2, and review box of "Mediterranean Economies 2020"; Jorge Ugan, review boxes of "Reduction in mobility and Covid-19 transmission" and "Association between mobility patterns and Covid-19 transmission in the USA: a mathematical modelling study".

References

- Badr, H. S., Du, H., Marshall, M., Dong, E., Squire, M. M., & Gardner, L. M. (2020). Association between mobility patterns and COVID-19 transmission in the USA: a mathematical modelling study. *The Lancet Infectious Diseases*, 20 (11), 1247-1254. [https://doi.org/10.1016/S1473-3099\(20\)30553-3](https://doi.org/10.1016/S1473-3099(20)30553-3)
- Borkowski, P., Jażdżewska-Gutta, M., & Szmelter-Jarosz, A. (2021). Lockdowned: Everyday mobility changes in response to COVID-19. *Journal of Transport Geography*, 90, 102906. <https://doi.org/10.1016/j.jtrangeo.2020.102906>
- EPA – United States Environmental Agency (2020). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. Retrieved at: <https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-main-text.pdf>
- Gao, S., Rao, J., Kang, Y., Liang, Y., & Kruse, J. (2020). Mapping county-level mobility pattern changes in the United States in response to COVID-19. *SIGSpatial Special*, 12(1), 16-26.
- Gargiulo, C., Pinto, V., & Zucaro, F. (2012). City and mobility: towards an integrated approach to resolve energy problems. *TeMA - Journal of Land Use, Mobility and Environment*, 5(2), 23-54. <https://doi.org/10.6092/1970-9870/920>
- Guida, C., & Natale, F. (2021). Ecological transition: which transactions?. *TeMA - Journal of Land Use, Mobility and Environment*, 14 (1), 93-98. <https://doi.org/10.6092/1970-9870/7878>
- Hendrickson, C., & Rilett, L. R. (2020). The COVID-19 pandemic and transportation engineering. *Journal of Transportation Engineering, Part A: Systems*. 146 (7) <https://doi.org/10.1061/JTEPBS.0000418>
- Laurent, É. (2021). The European Green Deal: from growth strategy to social-ecological transition. Vanhercke B., Spasova S. and Fronteddu B.(eds.). Retrieved at: <https://www.etui.org/sites/default/files/2021-01/07-Chapter5-The%20European%20Green%20Deal.pdf>
- Nouvellet, P., Bhatia, S., Cori, A. et al. Reduction in mobility and COVID-19 transmission. *Nature Communication* 12, 1090 (2021). <https://doi.org/10.1038/s41467-021-21358-2>
- Meng, F., Guo, J., Guo, Z., Lee, J. C., Liu, G., & Wang, N. (2021). Urban ecological transition: The practice of ecological civilization construction in China. *Science of The Total Environment*, 755, 142633. <https://doi.org/10.1016/j.scitotenv.2020.142633>

Schmidt, K., Sieverding, T., Wallis, H., & Matthies, E. (2021). COVID-19—A window of opportunity for the transition toward sustainable mobility?. *Transportation Research Interdisciplinary Perspectives*, 10, 100374. <https://doi.org/10.1016/j.trip.2021.100374>

Śleszyński, P., Nowak, M., & Blaszkę, M. (2020). Spatial policy in cities during the Covid-19 pandemic in Poland. *TeMA - Journal of Land Use, Mobility and Environment*, 13(3), 427-444. <https://doi.org/10.6092/1970-9870/7146>

Authors' profiles

Carmen Guida

She is an engineer, Ph.D. student in Civil Systems Engineering at Department of Civil, Architectural and Environmental Engineering of University of Naples Federico II. Currently, her Ph.D. research concerns accessibility to urban services for elderly people with the aim of minimizing social exclusion and inequalities within urban areas.

Jorge Ugan

He is an engineer, Ph.D. student in Civil Engineering at Department of Civil, Environmental, and Construction Engineering of University of Central Florida. Currently, his Ph.D. research concerns innovative ways to reduce speeding on urban arterials with the aim of increasing pedestrian safety within urban areas.