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Article

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Journal of Urban Management

Provided in Cooperation with:

Chinese Association of Urban Management (CAUM), Taipei

Suggested Citation: Sikder, Sujit Kumar (2020) : Transition to the new normal: Lens on the urban spatial data science agenda, Journal of Urban Management, ISSN 2226-5856, Elsevier, Amsterdam, Vol. 9, Iss. 4, pp. 396-397,
<https://doi.org/10.1016/j.jum.2020.08.003>

This Version is available at:

<https://hdl.handle.net/10419/271405>

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Transition to the New Normal: Lens on the Urban Spatial Data Science Agenda



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The world is currently experiencing a COVID-19 pandemic, and possibly suffering its second wave in September 2020 (i.e. [An der Heiden & Buchholz, 2020](#); [An der Heiden & Buchholz, 2020](#)). Like many other domains, the agenda of urban spatial data science requires a revision to adapt to these new challenges, and to demonstrate its potentials to contribute in sustainable transition processes. This short essay is an initiative to make an invitation to reader rather than provide a complete insight on the issue raised here in the context of COVID-19 era. Cities should not be considered as a problem, but, offer innovative solutions to the contemporary global challenges.

“Urban Spatial Data Science (USDS)” can be considered – in my understanding or proposal – a marriage among “Urban”, “Spatial” and “Data” sciences. The USDS agenda catalyses dynamic factors related (but not limited to) the smart city (Sensors, IoTs), open data (APIs) and Volunteered Geoinformations (social media, crowd) movements. The trends and evolution of technology as well as data shows that often there are complexity remains unsolved in relation to requirements of domain knowledge, data formats, licenses and software.

The nexus of urban science has been delegated for example- [Batty \(2013\)](#) “...cities must be studied as a process that simultaneously transforms places, populations, societies and the environment”. These endeavours are largely related to the *theory of urban structure* (“The city” by Park and Burgess in 1925 and more recently the *theory of urban fabric* ([Newman et al., 2016](#)); however, it requires to re-experiment and rethink when the urban dynamics - and especially, the human mobility and land use - are creating impacts largely due to new dimension of pandemics.

Since last twenty years, several organizations are emerging with growing interests and investments on various potential topics with the scope of new urban data (also called big data) – not necessary only spatial ([Guan, 2019](#); [Zhou, 2020](#)). Most of them are following either multi OR even transdisciplinary approaches to their research design, and even include social, natural, information scientists as well as professional/institutional actors in investigators team.

In near a term, the trend of going virtual – will affect for example hospitality and entertainment sectors (meaning more unused or vacant space); more local consumption (less dependent on international trade); new migration trends (families are leaving most of the members at rural area due not less income earning and reduction of risk of affected by virus contact). In fact, some discussion are raising – Is it the end of cities?

COVID19 and contemporary urban topics are: (i) density, (ii) mobility (iii) connectivity. New norms are pushing to follow social distancing and to go more virtual for every means of activity including – work, meeting, entertainment, shopping, schooling and so on ([Batty, 2020](#); [Rose-Redwood et al., 2020](#)). Therefore, a dynamic change may have an impact to data collection and sources, which should be considered for many reasons. Some of the causes are neighbourhood lockdown, limited access to roadway, empty/limited workplace and more home office/education, change of consumer locations, limited public transportation rather active/micro mobility modes and so on. In fact, the transition to the new normal in USDS's agenda has to consider many factors that are often related to spatial causality, models and interpretation.

This new insight should explore the urban form, the functionality of Central Business District (CBD) and related human activities in global to local levels. In fact, this transition and impact may need to be conceptualized according to scale, size and time. For

DOI of original article: <https://doi.org/10.1016/j.jum.2020.08.004>

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<https://doi.org/10.1016/j.jum.2020.08.003>

Received 17 July 2020; Accepted 3 August 2020

Available online 10 September 2020

2226-5856/ © 2020 Published by Zhejiang University and Chinese Association of Urban Management.

example, large cities are impacting faster the USA context during pandemic (Stier et al., 2020), which might also true for many other global cities.

International Data Corporation (IDC) “Data Age 2025” — predicts that worldwide data creation will grow to an enormous 163 zettabytes (ZB) by 2025, which is tenfold the amount of data produced in 2017 (Reinsel et al., 2018). However, the scenario may differ due to the effect of ongoing pandemic. In the context, the flight against Corona-virus infections, the contract-tracing and surveillance applications are made available in many countries – however, the use of such tools remain voluntary. They are gathering tons of personal data even with high level sensitivity. Blue-tooth based technologies are not getting high level of public trust and meanwhile other apps may be listening the users even by manipulating privacy protection rules. The access to such contemporary datasets for valuable information extraction/mining will largely depend on local regulations. Apart from new data sources, the typical data gathering workflow or official data archives may be interrupted – that can often become one of the challenges for modelling and estimating the dynamic determinants of urban planning, management and development. Some examples are the infrastructure planning with fusion of open data and Volunteered Geoinformation (VGI) in order to capture the spatial patterns of electro-vehicle charging stations (Sikder, 2018a); downscaling energy consumption intensity in use of official building information, public sector mobility information and statistical survey data (Sikder, 2018b). However, individuals mobility behaviour information is becoming more uncertain; they may prefer the use of private vehicles in order to avoid public transport, although people are also traveling less in new normal.

The key drivers within the scope of USDS might continue to be attractive in view of: (i) **Computation:** machine learning, deep learning, artificial intelligence; and (ii) **Regulations:** FAIR/Open knowledge movement, digital/smart citizenship and easy/cheap access to technology. The so-called black-box technological innovations can achieve better precision in calibrating, enhancing data services, and increasing computational capacities and attract new modes in urban social innovation including participation of dynamic actors.

COVID19 pushes to raise relevant questions within the scope of USDS: What is the future of urban density and mixed use? What about spatial inequality of vulnerable populations? What are the dynamics of its impact on mobility services and behaviour? Where are the hot-spots of spatial impact in nature based solutions (NBS)? How does access to green and blue spaces may change? How will large city regions may impact on their surroundings? – this list should be continued further.

The new dimensions of urban living in the new normal show the adoption of similar activities such as e-commerce, distance office, active mobility – these are often demands of greater transformation to deal with global environmental challenges. In fact, USDS' agenda should fit to generate new knowledge for supporting evidence based policy making in focus: what are the state of new normal urban trends-by asking what, where, how, why?

USDS should be able to explore and predict “what if” scenarios that can validate reality with the fusion of old-new OR new-new (data and models). It should not have to be just physical – rather it needs a combined understanding of socio-demographic-economic-environmental dimensions; where a option of spatial link/consideration will be always valuable (e.g Bacao et al., 2020; Bensmann et al., 2020). Of course, fundamental efforts need to continue to detect the changes and even causality, the scale effect of data, uncertainty, privacy and legal bindings.

The movement for open knowledge may ask us to consider the reproducibility or replicability paradigm in science which may also be relevant and highly possible within the scope of USDS, where digital technologies and dynamic datasets remain in the core. However, the research should be progressive and proactive to cope with the changing environment.

Let's learn to plan, build and manage better beyond the crisis of COVID19 by adopting cutting age innovations of science, technology and regulations!!! Even with Digital twins (industry 4.0) or beyond!!!

References

- An der Heiden, M., & Buchholz, U. (2020). *Modellierung von beispiele szenarien der sars-cov-2-epidemie 2020 in deutschland*. Unter Mitarbeit des Robert Koch-Instituts.
- Bacao, F., et al. (2020). Spatial data science. *ISPRS Int. J. Geo-Inf.* 9, 428.
- Batty, M. (2013). *The new science of cities*. MIT press.
- Batty, M. (2020). *The coronavirus crisis: What will the post-pandemic city look like?* London, England: SAGE Publications Sage UK.
- Bensmann, F., et al. (2020). An infrastructure for spatial linking of survey data. *Data Science Journal*, 19.
- Guan, C., et al. (2019). Designing walkable cities and neighborhoods in the era of urban big data. *Urban Planning International*. In press <http://nrs.harvard.edu/urn-3:HUL.InstRepos:41254716>.
- Newman, P., et al. (2016). Theory of urban fabrics: Planning the walking, transit/public transport and automobile/motor car cities for reduced car dependency. *Town Planning Review*, 87, 429–458.
- Reinsel, D., et al. (2018). The digitization of the world from edge to core. *Framingham: International Data Corporation*.
- Rose-Redwood, R., et al. (2020). Geographies of the covid-19 pandemic. *Dialogues in Human Geography*, 10, 97–106.
- Sikder, S. K., et al. (2018a). Halten sie die augen nach einer ladestation offen! – die e-ladestations-infrastruktur in deutschland: Eine räumliche analyse. *AGIT Journal für Angewandte Geoinformatik*, 4, 218–227.
- Sikder, S. K., et al. (2018b). A geospatial approach of downscaling urban energy consumption density in mega-city dhaka, Bangladesh. *Urban Climate*, 26, 10–30.
- Stier, A., et al. (2020). *Covid-19 attack rate increases with city size*. Mansueto Institute for Urban Innovation Research Paper.
- Zhou, C., et al. (2020). Covid-19: Challenges to gis with big data. *Geography and Sustainability*.