

EDITORIAL OPEN



Covid, cities, and sustainability: a reflection on the legacy of a global pandemic

Covid is fading into history in our cities around the world, but its implications are still worth reflecting upon. This special collection called "Covid, Cities and Sustainability" in *npj Urban Sustainability* has been a pleasure to encourage and edit for the reflections it has provided.

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I spent a lot of my time during Covid writing about how theories such as Innovation Waves and Transition Theory are now much more relevant as they both show how big changes can come out of deep economic downturns¹. I suggested that much of the climate agenda would become mainstreamed due to decarbonizing technologies becoming the basis of new investment. Little did I realize how quickly this would happen and how much of my musings could be seen in the papers in this edition.

This series was about what it means for cities in their mobility, economy, carbon footprints, air pollution, poverty levels, and how the virus spread in different urban fabrics^{2–12}. Papers also picked up on the revival and regeneration of local places^{13–18} spurred on by their dramatically increased need during the pandemic. Others have enabled us to understand the health implications of these increased local green spaces and local walkability^{14,15,17–19}.

Perhaps the most interesting perspective I have gained from focussing on the papers in this series is that many of the expected changes to our cities did not happen. Three of these were quite obviously exposed.

1. **Density.** Pandemics create fear of exposure to people so it was predicted that there would be a reaction to high density buildings as happened in English-speaking cities after the 1930s depression. However, this did not appear to happen. High rise buildings were not more susceptible to pandemics instead we saw many people forming local groups and even choirs singing together from windows. The science showed density did not lead to more Covid but many other factors that required direct management were necessary to keep the virus at bay^{7–9,18,19}.
2. **Population Decline.** Some of the predictions that cities would decline as people were expected to leave for healthier rural locations did not happen. The data were if anything the opposite. Health services were critical for supporting large numbers of people through the pandemic and these were better in cities. So many other services and jobs are clearly going to continue to make cities, of all sizes, continue to grow in the post pandemic era^{2,4,5,11,18}.
3. **Transit Decline.** Public transport was immediately hit by the pandemic as was traffic in general. Transit agencies very rapidly began to show how with masks and daily cleaning, trains and buses could continue to provide a healthy kind of transport²⁰. For most cities, the patronage did not pick up again quickly as something else was setting in which is now bound to stay: virtual meetings through digital communications became routine. Smart phones and computers have begun to replace the need for some work trips in the city

and even many for business trips to other cities around the world. The quality of digital communications was able to meet the massive increase in demand and this is likely to remain. Many businesses are now providing for an extra day or two at home and finding this works well. Transit remains a major part of future cities and even more so as the decarbonization agenda takes over^{5,18}.

The Covid economic decline and the restart using new ways to frame an economy, are going to continue to emerge, and hopefully will be reflected in future papers in this journal. Perhaps we can begin to see what the next few decades of future growth in our cities will be, based on the things we have learned from Covid. Here are some of my learnings.

Decarbonization will rapidly happen with technology but urbanism will shape cities better for people and nature.

1. Smart technology integrated with solar, wind, batteries and electric vehicles will become rampant through the global economy enabling grids of all types and sizes in every part of the world^{21,22}. The smart systems will need local management as well as grid-scale management²³. Electric local vehicles and electric trackless trams will be integrated into mobility as a service replacing much need for car ownership²⁴. And electric trains between cities will become as common as planes are now.
2. Urbanism will insist on the significance of local places as these technological changes happen. They will need to be walkable and meaningful as well as activated for people of all ages and incomes¹⁸. Reduced automobile dependence will continue to grow as a major focus for cities to enable them to be competitive²⁵.
3. Nature-positive outcomes will also become the major focus for urbanism²⁶, building up biodiversity and enabling biophilic landscaping of soft and hard surfaces²⁷, closing canopies with street trees, all enabling cities to play a critical role in resilient responses to big weather changes.

Perhaps after these next few decades we may even see some of the more difficult parts of climate change begin to be provided with solutions.

Circular economy, hydrogen economy processing of industrial products, new fuels for shipping and aviation, will start to provide the last technologies and urbanism responses for decarbonization.


1. Circular economy will start to learn from the way smart technologies have shaped the application of renewables into local solutions by enabling simpler local manufacturing based on recycled waste²⁸.
2. Hydrogen will use smart systems to become cheap enough for processing locally all primary production including minerals and agricultural products²⁹, and the secondary production of manufactured goods but will disappear as an option for land transport.

- Shipping and aviation will have new renewable fuels but will never be able to compete with the cheap fuels of the late twentieth century and more and more alternatives for local economies will be provided²¹.

Overall I believe we can look forward to a period where cities in this post-Covid period, can become more regenerative and create hope for resolving the deep issues of urban sustainability^{28,30}. But it will need strong leadership from all urban professionals³¹.

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COMPETING INTERESTS

The authors declare no competing interests.



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