SMART CITIES IN THE TIME OF COVID-19

By Matthew Henshon

While the long-term trends pointing towards greater numbers of smart cities seem inexorable, the immediate future seems more cloudy. Smart cities depend on high demand for central real estate. Thanks to a literally once-in-a-century pandemic, demand for space in downtown urban areas is not certain. How fast our cities can snap back is still up in the air.

For more than a century, the country has been moving towards greater and greater urbanization. In 1900, 40 percent of America's population lived in cities. By 1920, the number would reach 50 percent.[1] The number of Americans who live in urban areas is 80 percent today.[2] And as more and more people crowd into a given geographic area, the demands on city services require greater efficiency.

We use the term "smart city" to describe municipalities that have been attempting in the past few years[3] to become smarter and more efficient—essentially, to incorporate data and artificial intelligence[4]—into their day-to-day service provision.[5] These current solutions include building energy grids that allow small power outages to be localized[6]; the upgrade of mass transit[7] and congestion-toll pricing to reduce car use[8]; and the expansive use of "311" phone apps to report potholes and other roadway problems.[9] Other elements of smart cities include hardening infrastructure against powerful hurricanes as New Orleans is doing,[10] or changing the building code so that new construction is more energy efficient, as recently occurred in Boston.[11]

There is another characteristic of smart cities that is occasionally noted: Certain localized sections in the urban core attract talented and intelligent people, becoming essentially cities-within-a-city. Urban areas have long been breeding grounds for economic growth, in part because close proximity allows ideas to germinate and spread over coffees, lunches, or dinners. And certain neighborhoods—or, as they more are often known, "clusters"—have become code words for targeted innovation: Kendall Square in Cambridge (biotech), Music Row in Nashville (performing arts), the Innovation District in Austin (health tech), and SOMA in San Francisco (software). Once established, these districts attract more and more like-minded intellectual talent, further cementing the "brand."[12] By attracting intellectual talent into a small physical space (often at or near the urban center), these clusters have the effect of demanding that the larger municipality become more efficient and livable—or, essentially, a "smart cluster" within a smart city.[13] And because demand for space in these areas is at such a premium, municipalities can often fund some of these technologically heavy initiatives as part of permitting for development.[14]

But—returning to COVID-19—for all cities (smart or otherwise) in March 2020, a global pandemic hit. Even though it had been predicted multiple times by the World Health Organization, preparations were lacking.[15] Within a month, huge swaths of the economy had been shut down. Much of America had moved from commuting to work to commuting to the dining room.[16]

In years prior, technology advances like personal computers, Internet access, and smart phones had made work from home (or out of the office) easier and productive. At the time, these technologies were seen as mere adjuncts; in the depths of the pandemic, these technologies became vital. But the pandemic showed the apparent reality that much of white-collar America could work from home with little or no decrease in measurable productivity. If the NASDAQ Composite is a fair representation of the expected future profits of technology companies (and we agree that tech companies are predominantly white collar), the index more than doubled from March 2020 to October 2021.[17]

However, it is also true that not all workers can work from home. The vast majority of restaurant workers need people actually in the restaurants. Most gym attendants need people working out. If the net result of COVID is the de-densifying of urban cores, it means that some of these jobs were eliminated—or changed significantly. Restaurant waiters were replaced by GrubHub drivers. Pilates instructors ended up teaching small classes via Zoom.[18] There will be further adjustments as these changes are absorbed by labor markets.

Accordingly, the future of downtown real estate—the core of the smart city—is up in the air. While PPP loans under the 2020 CARES Act[19] helped landlords (and tenants) survive the worst of the dip, the jury remains out on how the dislocation will play out. Many landlords worked out private arrangements with corporate clients to defer rent or otherwise extend lease terms.[20] However, other—especially retail—tenants closed their downtown locations permanently; workers who ventured into deserted offices in late 2020 often found their favorite lunch place shuttered.

The fundamental question is: What will be the demand for downtown space in a post-COVID world? The irony is that some of the factors driving smart cities—like robust 5G Internet access[21] and surge pricing for traffic (discouraging rush hour commuting)—can seem to also have the effect of reducing demand for downtown office space.[22] As the pandemic drags on, multiyear corporate leases will continue to expire, and companies may take extensive looks at their existing office footprint. Work from home, hybrid arrangements, and hoteling (the sharing of unique offices between one or more employees) had previously been the province of consulting and other travel-heavy companies. But now these schemes have become

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usual—if not expected. If employees work from home one or two days a week, the net effect could potentially reduce a firm's real estate footprint by 20 to 40%, which will potentially adversely affect office demand, with knock-on effects for restaurants and other downtown services.[23]

Office tower construction, which requires long lead times for permitting, financing, and (eventually) construction, has effectively stopped in some markets, awaiting more clarity on demand. In Washington, D.C., perhaps the hottest urban market in the U.S. (at least for office growth), construction has essentially halted. "'The pipeline is dwindling to zero,' said Randy Harrell, CBRE's Vice Chairman, 'In a normal environment we'd see . . . somewhere between one and two million square feet (of new office space) deliver[ed] every year in Washington.'"[24] And the pause in new construction will delay advances in efficiency for many smart cities; new buildings are easier to build "smart" than trying to retrofit existing ones.[25] Boston's new construction code (mentioned above) only applies to new (and very large) buildings; however, while these represent just 4% of the city's buildings, they produce 60% of Boston's building's emissions of greenhouse gasses.[26] Likewise, "linkage" fees that cities can use to obtain new technologies are usually tied to new construction.[27]

However, some white-collar jobs simply cannot be facilitated at home. Medical and research jobs often require access to sterile or other highly specialized lab facilities that need to be on-site. The continued growth in biotech and life sciences (which was accelerated by COVID) means that in certain parts of the country, thousands of square feet of office space will be converted to high-tech clean spaces.[28] But the pace of this conversion may not be as quick as we might think; to host a lab, most office buildings need to upgrade their electrical and HVAC[29] systems significantly, often by adding heavy equipment to the roof of the existing building. In addition to structural-support issues, this equipment can cause trouble with local zoning codes, especially if the existing building is already at the applicable height restriction, or with neighbors, who sometimes consider it an eyesore.[30]

Living in downtown areas will also be a subject for discussion as COVID recedes. There was clearly an exodus of young families during the first year of COVID—suburban houses with yards and nearby playgrounds were being bought at premiums.[31] Relatedly, prices for vacation or other second homes throughout the country exploded; with people working remotely everywhere, there was no need to be located in urban (or even suburban) areas.[32] Traffic, parking, and pedestrian traffic were all reduced while much of the country "huddled in place." But since the vaccines have become widespread, the appetite for city residences has swung back; in Boston, for instance, through July 2021, condo sales were up 52.5% over a year ago (albeit in the depths of the pandemic). But the total volume of July 2021 sales exceeded "any year in recent memory."[33]

COVID-19 will not be the last pandemic the world faces. In 1918–1920, the Spanish Flu killed almost as many people as have already died in the COVID era (but with a smaller base population).[34] But cities recovered, and the trend to urbanization continued. Smart cities and their "smart clusters" will undoubtedly bounce back, but the question is, how fast? And what can smart cities do to make themselves more resilient against the next pandemic?

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ENDNOTES

1. John Helyar, Lords of the Realm 5–6 (1994).

2. Bryan Walsh, *The Smart City Comes of Age*, Axios (Oct. 16, 2022), https://www.axios.com/smart-city-5g-data-privacy-0f8e6535-3cad-4ceb-86a2-dd4cefcd28a7.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosam&stream=top.

3. Or perhaps even longer. French architect Le Corbusier wrote of a "Radiant City" in the 1930s. Ben Green, The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future 148 (2020). *Cf.* Robert Moses' efforts to use urban resources to effectively shape both New York City "and its sprawling suburbs." Robert Caro, The Power Broker 5 (1975).

4. The field was only introduced to the world in 1956 at Dartmouth College. John D. Kelleher, Deep Learning 4 (2019).

5. The European Commission defines them as "a place where traditional networks and services are made more efficient with the use of digital solutions." *Smart Cities*, European Comm'n, https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en.

6. Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World 276 (2015).

7. Recent deprivation studies—that is, the voluntary deprivation of volunteer subjects from the use of cars—shows that improvements to mass transit depend on providing agency to users. "What the research shows isn't that travelers want cars, but rather that they want *freedom and control*. If technology [can do so], if it can liberate them from, for example, the tyranny of cars, such as the need to find a place to park them, they are going to like it. A lot." Samuel I. Schwartz, Street Smart 189 (2015).

8. Manhattan has arguably "the lowest per capita carbon output of any American community." Anthony M. Townsend, Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia 278 (2013).

9. Green, *supra* note 3, at 40–41; *see also* Townsend, *supra* note 8, at 190.

10. Emily Lane, *"Start Making the Investment Today": After Ida, a Push to Harden the Power Grid*, WDSU (Sept. 23, 2021), https://www.wdsu.com/article/start-making-the-investment-today-

after-ida-a-push-to-harden-the-power-grid/37712492#. Of course, New Orleans has a long history of attempting to hold back rising waters. *See, e.g.*, John McPhee, The Control of Nature 42 (1990).

11. Michael P. Norton, *New Ordinance to Squeeze Emissions from Boston's Largest Buildings*, WBUR (Oct. 5, 2021), https://www.wbur.org/news/2021/10/05/boston-signs-carbon-neutral-buildings-ordinance.

12. The trend for cities with intellectual capital to pull further away has been going on for close to 80 years. If less than 5% of a city's adult population had a college degree in 1940, that percentage would still be under 19% in 2000; conversely, cities with more than 5% of college degrees rose to 29% in the same period. Edward Glasser, Triumph of the City 232 (2011).

13. As evidenced by these cities' plans for smarter growth around the respective clusters: Cambridge: Patrick Sisson, *As Top Innovation Hub Expands, Can Straining Local Infrastructure Keep Pace?*, Curbed (Nov. 6, 2018), https://archive.curbed.com/2018/11/6/18067326/boston-real-estate-cambridge-mit-biotech-kendall-square; Nashville: *Music City Smart Public Transit*, Nonfiction, https://nashville.nonfiction.design/; Austin: *Innovation and Smart Cities*, Downtown Austin All., https://downtownaustin.com/economic-development/innovation-startups/; San Francisco: *Central SoMa Plan*, S.F. Planning, https://sfplanning.org/central-soma-plan.

14. ECPA Urb. Plan., *Case Study: The Boston Waterfront Innovation District*, Smart Cities Dive (2011), https://www.smartcitiesdive.com/ex/sustainablecitiescollective/case-study-boston-waterfront-innovation-district/27649.

15. Alex de Waal, New Pandemics, Old Politics: Two Hundred Years of War on Disease and Its Alternatives 208 (2021).

16. The average US house is increasing in size from 1,786 square feet in 2019 to an expected 1,987 square feet in 2050. Roger Duncan & Michael E. Webber, The Future of Buildings, Transportation, and Power 34 (2020). The book was published in July 2020, and thus was written before the scope of the pandemic was known, so it may understate the future growth of the size of houses in a world of seemingly universal home offices.

17. *Market Data*, Wall St. J., https://www.wsj.com/market-data?mod=Home_MDW_MDC. The NASDAQ is up 50% over where it was in January 2020, before the pandemic hit.

18. One clear trend that has emerged in the second year of COVID-19 has been the "resignation nation"; many people have decided to permanently leave their pre-existing permanent jobs and either take regular but part-time work, take intermittent "gig" work (like driving for Uber), or simply stop working (to care for a parent or child, for instance). But what is fascinating is that these trends are not happening in the coastal states, with the largest cities in the country, but rather rural states like Kentucky, Idaho, and Alaska. Measured in August 2021, "Kentucky saw the . . . [highest] quit rate, or the share of employed workers who quit their jobs in the month, hitting 4.5% in August and exceeding all other states' readings. Georgia and Idaho followed with rates of 4.2% and 4.1%, respectively. Alaska had the fourth-highest rate of 3.9%." Ben Winck & Madison Hoff, *This Map Shows Which US States Have the Most People Quitting Their Jobs*, BusinessInsider (Oct. 22, 2021), https://www.businessinsider.com/americans-quitting-jobs-most-map-great-resignation-labor-market-shortage-2021-10.

19. Coronavirus Aid, Relief, and Economic Security Act (CARES Act), Pub. L. No. 116-136, 134 Stat. 281 (2020).

20. Kelsi Maree Borland, *Many Landlords Are Requiring Tenants to Get PPP Funding for Rent Relief*, Globe St. (Apr. 14, 2020), https://www.globest.com/2020/04/14/many-landlords-are-requiring-ppp-funding-for-rent-relief/?slreturn=20210926131447.

21. Walsh, *supra* note 2.

22. Although some historians argue that the "growth of cities and the spread of information technology *are* . . . strongly linked." Townsend, *supra* note 8, at 6.

23. Of course, some of that may be offset by distancing within offices, giving each employee more space.

24. Paige Hopkins & Cuneyt Dil, *D.C.'s Building Boom Grinds to a Halt*, Axios DC (Sept. 22, 2021), https://www.axios.com/dc-office-buildings-construction-stop-17a738c4-a8b7-4e9b-b0b9-c165e18a4da1.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosam&stream=top.

25. Duncan & Webber, *supra* note 16, at 41; *see also* Patrick Sisson, *As Risks of Climate Change Rise, Investors Seek Greener Buildings*, N.Y. Times (Oct 26, 2021), https://www.nytimes.com/2021/10/26/business/climate-change-sustainable-real-estate.html.

26. Or 42% of the city's overall gas emissions. Norton, *supra* note 11.

27. ECPA Urb. Plan., *supra* note 14.

28. Debra Kamin, *"A Wild 15 Months": Pandemic Spurs Conversion of Offices to Labs*, N.Y. Times (July 27, 2021), https://www.nytimes.com/2021/07/27/business/office-space-conversion-labs.html.

29. Heating, ventilation, and air conditioning (HVAC).

30. Jon Chesto, *As They Spread Beyond Hubs, Labs Getting Less of a Welcome*, Bos. Globe, Oct. 27, 2021, at A1–A6.

31. Joy Wiltermuth, B*ig City Flight Led to Surging Suburban Home Prices—Will It Outlast the Pandemic?*, MarketWatch.com (Feb. 16, 2021), https://www.marketwatch.com/story/big-city-flight-led-to-surging-suburban-home-prices-will-it-outlast-the-pandemic-11613510270.

32. Anna Bahney, *People Are Snatching up Vacation Homes. And Many Are Paying with Cash*, *CNN* (June 17, 2021), https://www.cnn.com/2021/06/17/homes/vacation-home-sales-increase-covid-feseries/index.html.

33. Jon Gorey, *Reports of the Death of City Condos Are Greatly Exaggerated*, Bos. Globe Mag., Sept. 19, 2021, at 35.

34. Elizabeth Gamillo, *Covid-19 Surpasses 1918 Flu to Become Deadliest Pandemic in American History*, Smithsonian Mag. (Sept. 24, 2021), https://www.smithsonianmag.com/smart-news/the-covid-19-pandemic-is-considered-the-deadliest-in-american-history-as-death-toll-surpasses-1918-estimates-180978748.