



UNIVERSITY OF
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COVID-19 — IMPACTS ON CITIES AND SUBURBS

IMPACTS TO THE URBANISM NEXT FRAMEWORK

URBANISM NEXT CENTER



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ACKNOWLEDGEMENTS

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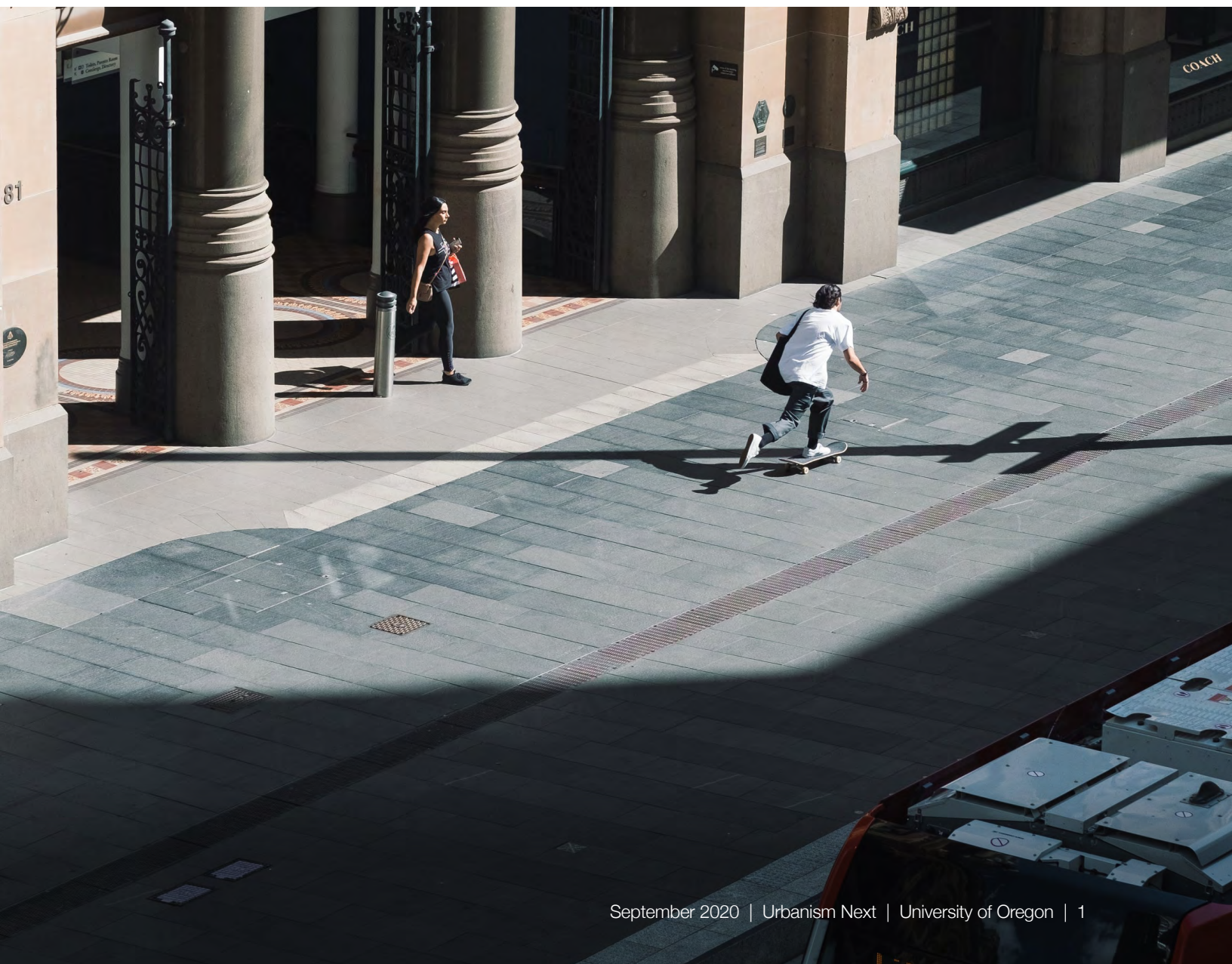
The Urbanism Next Center at the University of Oregon focuses on understanding the impacts that new mobility, autonomous vehicles, e-commerce, and urban delivery are having and will continue to have on city form, design, and development. The Center does not focus on the emerging technologies themselves, but instead on the multi-level impacts — how these innovations are affecting things like land use, urban design, building design, transportation, and real estate and the implications these impacts have on equity, health and safety, the economy, and the environment. We work directly with public and private sector leaders to devise strategies to take advantage of the opportunities and mitigate the challenges of emerging technologies. Urbanism Next brings together experts from a wide range of disciplines including planning, design, development, business, and law and works with the public, private, and academic sectors to help create positive outcomes from the impending changes and challenges confronting our cities. Learn more at www.urbanismnext.org.

INTRO

Prior to COVID-19, Urbanism Next developed a [Framework](https://www.urbanismnext.org/resources/urbanism-next-framework)* to describe the multi-level impacts of emerging technologies – namely, new mobility, autonomous vehicles (AVs), and e-commerce – on the built environment. We believe that COVID-19 has disrupted the trajectory of these emerging technologies and will, in turn, change some of the assumptions included in our original framework. This paper outlines the specific COVID-19 disruptions we have identified and the potential changes they will cause.

[*www.urbanismnext.org/resources/urbanism-next-framework](https://www.urbanismnext.org/resources/urbanism-next-framework)

This is the second paper in a series Urbanism Next is releasing focused on the COVID-19 pandemic. The first paper summarizes our initial findings on the impacts of COVID-19 on the built environment, providing background for the COVID-19 disruptions identified in this paper.



COVID DISRUPTIONS

The following COVID-19 disruptions are trends that are influencing – and have the potential to continue influencing – the predictions made and questions raised in the Urbanism Next Framework. We believe that some of these COVID-related changes could persist beyond

the “in-crisis” timeframe of the pandemic due to habits, necessity, innovation, structural shifts (e.g. the closing of small businesses) or shifts in trust between the public or private sector.

The COVID-19 disruptions we have identified include the following:

INCREASED DEMAND/PREVALENCE

- + **Work from home (WFH).**
- + **Driving alone.**
- + **Goods and meal delivery.**
- + **Maturity of delivery business models.**
- + **E-commerce.**
- + **Bicycle purchases and use.**
- + **Tactical urbanism.**
- + **Fear of crowded public space.**
- + **Interest in automated delivery devices.**

DECREASED DEMAND/PREVALENCE

- **Transportation and travel.**
- **Economic activity.**
- **Dining out and number of open restaurants.**
- **Number of brick-and-mortar stores.**
- **Number of small businesses.**
- **Public transit ridership.**
- **Public transit services and revenues.**
- **Demand for transportation network companies (TNCs).**
- **E-scooter ridership and availability.**
- **Interest in passenger AV technology.**
- **Venture capital funding.**

INCREASED DEMAND/PREVALENCE

- + **Increased work from home (WFH).** Stay at home orders and efforts to slow the spread of COVID-19 have led to large increases in the number of people working from home¹ with some companies announcing their employees can work remotely indefinitely.²
- + **Increased driving alone.** As travel began to bounce back after initial shutdowns, people have shifted away from public transit to avoid crowds and the possibility of catching or spreading COVID-19. The CDC also recommended driving alone in their initial guidance for reopening.³ These factors have led to an increase in single-occupancy vehicle (SOV) trips.⁴

¹ A.;Sun,Hugette, “Ability to Work from Home”; Zojceska, “COVID-19 & Work From Home Stats.”

² Uri Berliner, “Get A Comfortable Chair: Permanent Work From Home Is Coming,” NPR.org, June 22, 2020, <https://www.npr.org/2020/06/22/870029658/get-a-comfortable-chair-permanent-work-from-home-is-coming>.

³ Camila Domonoske, “CDC Now Recommends Driving Alone. But What If You Don’t Have A Car?,” NPR.org, June 16, 2020, <https://www.npr.org/2020/06/16/874750935/cdc-now-recommends-driving-alone-but-what-if-you-dont-have-a-car>.

⁴ Somini Sengupta and Brad Plumer, “How Cities Are Trying to Avert Gridlock After Coronavirus Lockdowns,” The New York Times, June 26, 2020, sec. Climate, <https://www.nytimes.com/2020/06/26/climate/cities-cars-traffic-congestion.html>.

+ Increased goods and meal delivery.

Goods and meal delivery have increased in popularity as people have sheltered at home and tried to avoid crowded places.⁵ In addition, curbside pickup has skyrocketed for retail purchases.⁶

+ Increased maturity of delivery business models.

As demand for delivery has increased and many more companies have jumped on board, companies are working on streamlining and perfecting their business models and operations.⁷

+ Increased e-commerce.

There has been a rapid increase in online shopping as people have been staying home to reduce their exposure to COVID-19.⁸

+ Increased bicycle purchases and use.⁹

Rates of cycling have increased and sales are up, which may be due to several factors: people may be choosing bicycles for functional trips such as commuting and errands rather than taking public transit; people may be increasing their time riding bicycles as a safe way to

recreate and exercise; and many cities have created temporary or permanent bike infrastructure that could be encouraging more people to get on bikes.¹⁰

+ Increased tactical urbanism.

COVID-19 has inspired cities globally to use tactical urbanism methods and quick-build principles for right-of-way adaptations.¹¹ Many cities have reallocated street and sidewalk space for restaurants and retail businesses to expand outdoors and for additional public space for walking, biking, and rolling.

+ Increased fear of crowded public space.

The rapid transmission of COVID-19 has created an increased fear of crowded spaces and public transit.¹²

+ Increased interest in automated delivery devices.

In the era of social distancing, there has been a renewed interest in automated delivery devices (or personal delivery devices) that can deliver goods and food without human contact.¹³

⁵ Statista, "Grocery Delivery App Growth Due to Coronavirus U.S. 2020," Statista, March 2020, <https://www.statista.com/statistics/1104519/grocery-delivery-app-growth-coronavirus-us/>.

⁶ Adobe Analytics, "Curbside Pickup at Retail Stores Increase 208% During Coronavirus Pandemic," Supply and Demand Chain Executive, May 1, 2020, <https://www.sdcexec.com/transportation/press-release/21131320/adobe-curbside-pickup-at-retail-stores-increase-208-during-coronavirus-pandemic>.

⁷ Marc-André Kamel et al., "How to Ramp Up Online Grocery—without Breaking the Bank," Bain, July 9, 2020, <https://www.bain.com/insights/how-to-ramp-up-online-grocery-without-breaking-the-bank/>.

⁸ Stephanie Crets, "Online Sales Taper off in July as Retail Stores Reopen," Digital Commerce 360, August 11, 2020, <https://www.digitalcommerce360.com/article/coronavirus-impact-online-retail/>.

⁹ Christina Goldbaum, "Thinking of Buying a Bike? Get Ready for a Very Long Wait - The New York Times," May 18, 2020, <https://www.nytimes.com/2020/05/18/nyregion/bike-shortage-coronavirus.html>.

¹⁰ Sandra Caballero and Philippe Rapin, "COVID-19 Made Cities More Bike-Friendly – How to Keep Them That Way," World Economic Forum, June 19, 2020, <https://www.weforum.org/agenda/2020/06/covid-19-made-cities-more-bike-friendly-here-s-how-to-keep-them-that-way/>.

¹¹ Becky Steckler, Tiffany Swift, and Carlos Pardo, "How Are Communities Reallocating the Street Right-of-Way to Safely Accommodate Recreational and Social Activities during the COVID-19 Pandemic?," 2020, <https://www.covidmobilityworks.org/insights/how-are-communities-reallocating-the-street-right-of-way-to-safely-accommodate-recreational-and-social-activities-during-the-covid-19-pandemic>.

DECREASED DEMAND/PREVALENCE

- **Decreased transportation and travel.** Stay at home orders, increased work from home, remote education, and closed borders have all led to decreases in transportation and travel overall.¹⁴
- **Decreased economic activity.** Temporary and permanent business closures and travel reductions have resulted in decreased economic activity overall triggering widespread recessions.¹⁵ In the U.S., the pandemic has led to massive unemployment and business closures as well.¹⁶
- **Decreased dining out and decreased number of open restaurants.** Restaurants were initially shut down in many states to slow the spread of COVID-19 and have since struggled to stay afloat with strict physical distancing and reduced hours in place.¹⁷
- **Decreased number of brick-and-mortar stores.** The temporary government economic shutdown measures used to slow the spread of COVID-19 and the overall decrease in economic activity paired with an increase in e-commerce have led to many brick-and-mortar stores shutting their doors.¹⁸
- **Decreased number of small businesses.** Small businesses that regularly operate at the margins have been hit the hardest in terms of business closures during the COVID-19 pandemic.¹⁹
- **Decreased public transit ridership.** Public transit ridership has seen drastic decreases as people are traveling less, working from home more, and afraid of crowded public places.²⁰

¹² Feargus O'Sullivan, "Londoners Have Become Afraid of Public Transit," Bloomberg.Com, June 12, 2020, <https://www.bloomberg.com/news/articles/2020-06-12/fear-of-public-transit-remains-high-in-london>.

¹³ NACS, "COVID-19 Speeds Robotic Delivery Improvements," May 21, 2020, https://www.convenience.org/Media/Daily/2020/May/21/6-COVID-19-Robotic-Delivery-Improvements_Tech.

¹⁴ Jeremy Sung and Yannick Monschauer, "Changes in Transport Behaviour during the Covid-19 Crisis," IEA, May 27, 2020, <https://www.iea.org/articles/changes-in-transport-behaviour-during-the-covid-19-crisis>.

¹⁵ The World Bank, "The Global Economic Outlook During the COVID-19 Pandemic: A Changed World," World Bank, June 8, 2020, <https://www.worldbank.org/en/news/feature/2020/06/08/the-global-economic-outlook-during-the-covid-19-pandemic-a-changed-world>.

¹⁶ Ben Casselman, "A Collapse That Wiped Out 5 Years of Growth, With No Bounce in Sight," The New York Times, July 30, 2020, sec. Business, <https://www.nytimes.com/2020/07/30/business/economy/q2-gdp-coronavirus-economy.html>.

¹⁷ Yelp, "Increased Consumer Interest in May Correlates with COVID-19 Hot Spots in June, According to the Yelp Economic Average," Yelp Economic Average, 2020, <https://www.yelpeconomicaverage.com/yea-q2-2020>.

¹⁸ Jennifer A. Kingson, "The Coronavirus Is Causing a Slow-Motion Retail Apocalypse," Axios, July 6, 2020, <https://www.axios.com/retail-apocalypse-coronavirus-stores-closing-77b8adf0-2cd1-499c-9375-fb3e05af0730.html>.

¹⁹ Emily Flitter, "'I Can't Keep Doing This:' Small-Business Owners Are Giving Up," The New York Times, July 13, 2020, sec. Business, <https://www.nytimes.com/2020/07/13/business/small-businesses-coronavirus.html>.

²⁰ Alejandro De La Garza, "COVID-19 Has Been 'Apocalyptic' for Public Transit. Will Congress Offer More Help?," Time, July 21, 2020, <https://time.com/5869375/public-transit-coronavirus-covid/>.

- **Decreased public transit services and revenues.**²¹ Transit providers have had far less revenue due to decreased ridership and some agencies making fares temporarily free to limit the risk of spreading COVID-19. At the same time, their costs have increased significantly in order to add additional safety measures to transit services. This has left many transit agencies with budget deficits and reduced services.
- **Decreased demand for transportation network companies (TNCs).** The decrease in transportation overall has decreased ridership across modes including TNCs.²² In addition, there are uncertainties associated with the risk of shared ride models and TNC rides are generally more expensive than other modes, so as people have less disposable income demand has decreased.
- **Decreased e-scooter ridership and availability.** E-scooter ridership had skyrocketed in 2019²³ before COVID-19 and then drastically fell during the pandemic. It is gradually increasing again but remains at lower levels than before COVID-19. Many companies have pulled their vehicles from city streets, laid off staff, or shut down operations entirely.²⁴
- **Decreased interest in passenger AV technology.** The momentum for testing and deploying passenger AV technology has been reduced as a result of the pandemic and declining interest in ridesharing.²⁵
- **Decreased venture capital funding.** New mobility companies have historically depended on venture capital and have yet to prove profitability. Since the onset of the COVID-19 pandemic, funding has become less available.²⁶

²¹ Regional Transportation District (RTD), "Financial Impacts of COVID-19 Will Reshape Agencies' Future Transit Service," RTD - Denver, August 19, 2020, <https://www.rtd-denver.com/news-stop/news/financial-impacts-of-covid-19-will-reshape-agencies-future-transit-service>.

²² Shannon Bond, "How Uber And Its Riders Are Adapting To The New 'Social,'" NPR.org, June 10, 2020, <https://www.npr.org/2020/06/10/873499410/how-uber-and-its-riders-are-adapting-to-the-new-social>.

²³ NACTO, "Shared Micromobility in the U.S.: 2019," National Association of City Transportation Officials, 2020, <https://nacto.org/shared-micromobility-2018>.

²⁴ Kersten Heineke, Benedikt Kloss, and Darius Scurtu, "The Future of Micromobility: Ridership and Revenue after a Crisis," July 16, 2020, <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-micromobility-ridership-and-revenue-after-a-crisis>.

²⁵ Kalea Hall, "Coronavirus Presents Obstacles for Autonomous Vehicles," May 26, 2020, <https://www.govtech.com/fs/transportation/Coronavirus-Presents-Obstacles-for-Autonomous-Vehicles.html>.

²⁶ Paul Lienert, "U.S. Mobility Startups Feel the Chill from the COVID-19 Crisis," Reuters, March 18, 2020, <https://www.reuters.com/article/us-health-coronavirus-autos-mobility-idUSKBN2153C9>.

FORCES OF CHANGE COVID-19 DISRUPTIONS

Prior to COVID-19, Urbanism Next identified new mobility and AVs, mobility as a service, and e-commerce and urban delivery as “forces of change” that could widely impact the built environment in cities. COVID-19 has disrupted the pre-pandemic trajectory of these “forces of change”, drastically accelerating the

adoption of e-commerce and urban delivery while new mobility, AVs, and mobility as a service face greater uncertainty than ever before. This section outlines how COVID-19 could influence the continued development and trajectory of the forces of change.

FORCES OF CHANGE

NEW MOBILITY / AVS

MOBILITY AS A SERVICE

E-COMMERCE /

URBAN DELIVERY

NEW MOBILITY/AVS

Prior to COVID-19, new mobility services including micromobility, microtransit, and TNCs were being rapidly piloted and deployed. While TNCs have yet to turn a profit, they have become ubiquitous on city streets. E-scooters have seen tremendous growth in the micromobility space in the past few years, with devices crowding sidewalks and streets, and multiple operators vying for market

share. Car manufacturers and autonomous technology companies have received large sums of venture capital funding to innovate and test AV technologies. Since the start of the pandemic, however, the outlook has changed and the following factors could change the trends and outcomes of new mobility/AVs that we projected pre-COVID-19:

Factors that could increase demand for new mobility/AVs:

decreased public transit services
decreased transit revenues.

Factors that could decrease demand for new mobility/AVs:

decreased transportation and travel,
increased work from home,
increased driving alone.

Factors that could shift TNC company business models:

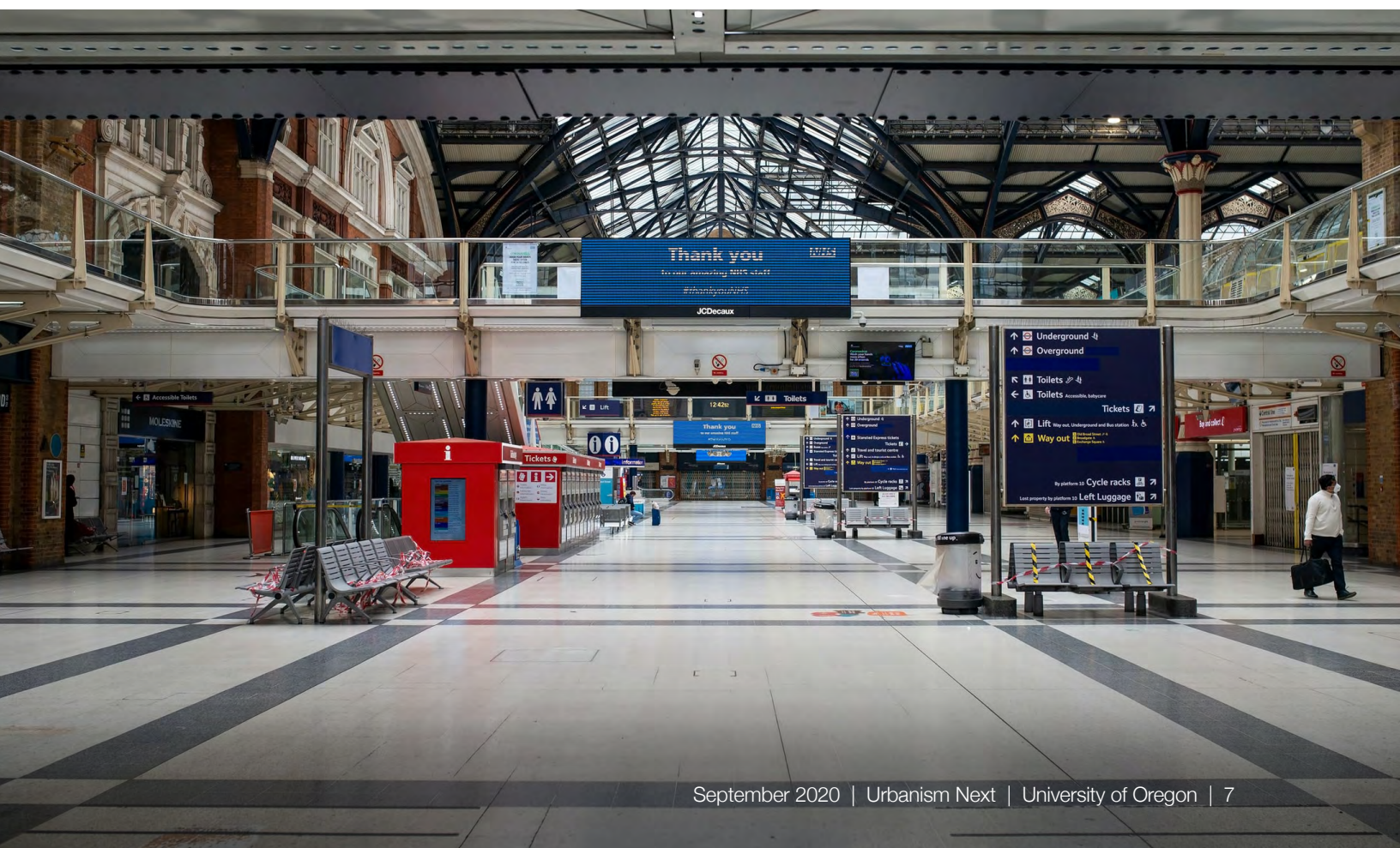
Decreased TNC ridership and increased goods and meal delivery and e-commerce may further accelerate the shift away from passenger services towards delivery. The development of shared ride models (e.g., Uber Pool, Lyft Line) is likely to be diminished, at least in the short-term, as people shy away from sharing enclosed spaces with strangers. A reduction in the availability of venture capital could mean less experimentation and investment in models that may lose money in the short term. On the flip side, funders may move companies towards narrower models and use cases that have a greater opportunity for profitability.

Factors that could shift micromobility:

Decreased e-scooter ridership and availability could pose challenges to e-scooter business models but could also leave a few companies with opportunities for acquisitions, market consolidation, and less competition in the long-term. An increase in temporary, tactical urbanism cycling infrastructure could become permanent and make micromobility safer and more inviting to a wider range of users.

Factors that could shift AV development:

Decreased interest in passenger AV technology will likely extend the timelines for passenger AV deployments while more interest in automated delivery devices may shift the focus of AV companies towards delivery vehicles.



MOBILITY AS A SERVICE (MAAS)

Mobility as a Service (MaaS) platforms allows riders to route, reserve and pay for trips, across a variety of modes, via a single app. Prior to the pandemic, multiple public and private sector entities were testing MaaS platforms internationally. Now, many of the COVID-19 disruptions are creating an uncertain future for MaaS and the new mobility companies that could potentially operate under MaaS umbrellas. The following factors could change the outcome of MaaS:

Factors that could increase MaaS interest/demand:

Although seen as a minor force in increasing MaaS interest, decreased public transit services and/or increased driving alone could propel potential riders to search for alternative transportation options.

Factors that could decrease MaaS interest/demand:

Decreased transportation and travel, decreased public transit ridership, decreased services and revenues, decreased TNC ridership, decreased e-scooter ridership and availability, and decreased interest in passenger AV technology are all factors that could pose barriers to MaaS platforms and integrated mobility solutions. In addition, increased work from home, driving alone, and bicycle purchases could indicate that people are changing their travel behaviors to avoid options where they share vehicles or space with others.

E-COMMERCE

Prior to COVID-19, e-commerce was becoming increasingly popular and widespread. The conditions of the pandemic have accelerated the adoption of e-commerce alongside the reduction in number of brick-and-mortar stores. The following factors could change the outcome of e-commerce:

Factors that could increase demand for e-commerce:

decreased transportation, travel, and number of brick-and-mortar stores, increased work from home, increased demand for goods and meal delivery, increased fear of crowded public space, and increased interest in automated delivery devices.

Factors that could decrease demand for e-commerce:

reduced economic activity.

URBAN DELIVERY

Like e-commerce, urban delivery patterns were already shifting before COVID-19 as e-commerce continued to expand and goods/meal delivery increased in popularity. COVID-19 has quickly accelerated the urban delivery trend bringing higher rates of goods/meal delivery associated with increased online ordering and desire to maintain physical distancing. The following factors could change the outcome of urban delivery:

Factors that could increase demand for urban delivery:

decreased transportation and travel, decreased number of brick-and-mortar stores and small businesses, increased work from home, e-commerce, and increased maturity of delivery business models (due to vastly increased use) that allow companies to provide better, more profitable service.

Factors that could decrease demand for urban delivery:

reduced economic activity.



FIRST ORDER IMPACTS COVID-19 DISRUPTIONS

This section outlines the first order impacts in the Urbanism Next Framework and COVID-19 disruptions that could increase or decrease the demand/salience of these impacts. Prior to COVID-19, we projected that the Forces of Change (new mobility/AVs, e-commerce, urban delivery, MaaS) would lead to the following

first order impacts. We currently believe that COVID-19 has accelerated, altered, or halted these previous predictions. While we do not yet know what direction COVID-19 will ultimately push the first-order impacts towards, we have identified variables that will likely disrupt the trajectory of each of these areas.

FIRST ORDER IMPACTS



CHANGE IN PARKING DEMAND



CHANGE IN VEHICLE MILES TRAVELED



CHANGE IN CONGESTION



CHANGE IN EASE OF TRAVEL



SHIFT IN MODES



COMPETITION FOR THE RIGHT-OF-WAY



CHANGE IN GOODS & MEAL DELIVERY



SHIFTING NATURE OF FREIGHT



CHANGE IN DEMAND FOR WAREHOUSING SPACE














































































































































































































REDUCTION OF BRICK-AND-MORTAR STORES



INCREASING INTEREST IN EXPERIENTIAL RETAIL





COVID-19 DISRUPTION EFFECTS ON FIRST ORDER IMPACTS

FIRST ORDER IMPACTS											KEY	
PARKING DEMAND	VEHICLE MILES TRAVELLED (VMT)	CONGESTION	EASE OF TRAVEL	SHIFT IN MODES	COMPETITION FOR R.O.W.	GOODS & MEAL DELIVERY	SHIFTING NATURE OF FREIGHT	DEMAND FOR WAREHOUSING SPACE	BRICK-AND-MORTAR STORES	INTEREST IN EXPERIENTIAL RETAIL	<div>  no change  decrease  increase  level of impact </div>	
											Work from home (WFH)	(+) INCREASED
											Driving alone	
											Goods and meal delivery	
											Maturity of delivery business model	
											E-commerce	
											Bicycle purchases and use	
											Tactical urbanism	
											Fear of crowded public space	
											Interest in automated delivery devices	
											Transportation and travel	(-) DECREASED
											Economic activity	
											Dining out and number of restaurants	
											Number of brick-and-mortar stores	
											Small businesses	
											Public transit ridership	
											Public transit services and revenues	
											TNC ridership	
											E-scooters and number of companies	
											Interest in passenger AV technology	
											Venture capital funding	







CHANGE IN PARKING DEMAND

Parking is one of the most prominent land uses in urban areas and a major source of revenue for cities. Prior to COVID-19, we were considering a future where AVs and New Mobility drastically reduced the need for parking. The pandemic has disrupted travel, shopping, and work habits which could in turn shift the demand for parking.

Factors that could increase demand for parking:

-  - Public transit ridership
-  - Public transit services and revenues
-  + Driving alone
-  + Tactical urbanism




Factors that could decrease demand for parking:

-  - Transportation and travel
-  - Economic activity
-  - Dining out and number of restaurants
-  - Number of small businesses
-  + Work from home
-  + Bicycle purchases and use





CHANGE IN VEHICLE MILES TRAVELED

Vehicle miles traveled (VMT) are among the largest contributing factors to greenhouse gas (GHG) emissions and climate change in the United States. VMT are also a major cause of congestion and vehicle crashes, injuries, and fatalities. COVID-19 could further increase or reduce overall VMT depending on which disruptive trends take hold in the long-term.

Factors that could increase VMT:

-  - Public transit ridership and services
-  + Driving alone
-  + Goods and meal delivery

Factors that could decrease VMT:

-  - Transportation and travel
-  - Economic activity
-  - Dining out and number of restaurants
-  - TNC ridership
-  + Work from home
-  + Bicycle purchases and use.



CHANGE IN CONGESTION

Congestion has become commonplace in urban areas and often goes hand in hand with commuting. Congestion is also known to cause chronic stress, increased pollution and environmental justice issues. It remains to be seen how levels of congestion will be impacted in the long-term as a result of COVID-19.

Factors that could increase congestion:

- ▲ - Public transit services
- ▲ + Driving alone
- ▲ + Goods and meal delivery

Factors that could decrease congestion:

- ▼ - Transportation and travel
- ▼ - Economic activity
- ▼ - Dining out and number of restaurants
- ▼ - TNC ridership
- ▼ + Work from home
- ▼ + Bicycle purchases and use



CHANGE IN EASE OF TRAVEL

The accessibility of different destinations and the amount people travel is directly tied to the ease—and cost—of that travel. COVID-19 could structurally shift transportation options which would have a significant, and potentially inequitable, impact on travel ease.

Factors that could increase ease of travel:

- ▲ + Work from home
- ▲ + Tactical urbanism

Factors that could decrease ease of travel:

- ▼ - Public transit ridership
- ▼ - Public transit services and revenues
- ▼ - TNC ridership
- ▼ - E-scooter ridership and availability
- ▼ + Driving alone
- ▼ + Goods and meal delivery





SHIFT IN MODES

It is widely acknowledged that single occupancy vehicles (SOVs) are contributing to congestion, pollution, and automobile crashes, injuries, and fatalities across the country. COVID-19 temporarily put a pause on much transportation as a whole and could provide impetus for people to shift their travel behaviors (SOVs, transit, micromobility, etc) as we adjust to “in-crisis” and “post-crisis” life.

Factors that could increase mode shift:

- ▲ - Public transit services
- ▲ - TNC ridership
- ▲ - E-scooter ridership and availability
- ▲ + Bicycle purchases and use
- ▲ + Work from home
- ▲ + Tactical urbanism

Factors that could decrease mode shift:

- ▼ - Transportation and travel
- ▼ - Public transit ridership
- ▼ + Driving alone



COMPETITION FOR THE RIGHT-OF-WAY

The right-of-way is a huge public asset that has been predominantly dedicated to automobiles for the past century. COVID-19 has highlighted the importance of outdoor, public space and the ability to physically distance which is often impossible in limited sidewalk spaces. COVID-19 has increased the demand for active transportation infrastructure and reclaiming right-of-way for restaurants/retail/public space. There has also been increased need for curb management to accommodate pick-up/drop-off zones and no-contact deliveries.

Factors that could increase competition for the right-of-way:

- ▲ + Goods and meal delivery
- ▲ + Bicycle purchases and use
- ▲ + Tactical urbanism
- ▲ + Interest in automated delivery devices
- ▲ + Driving alone

Factors that could decrease competition for the right-of-way:

- ▼ - Transportation and travel
- ▼ - Number of brick-and-mortar stores
- ▼ - Small businesses
- ▼ - TNC ridership
- ▼ - E-scooter ridership and availability,
- ▼ - Interest in passenger AV technology




CHANGE IN GOODS & MEAL DELIVERY

The demand for goods and meal deliveries was already increasing before the pandemic and one- and two-day deliveries have accustomed many customers to the convenience delivery services can offer. COVID-19 has rapidly accelerated the pre-pandemic trend of increasing demand for delivery services.

Factors that could increase goods & meal delivery:

-  - Transportation and travel
-  - Dining out and number of restaurants
-  - Number of brick-and-mortar stores
-  - Small businesses
-  + Work from home
-  + Goods and meal delivery
-  + E-commerce
-  + Fear of crowded public space

Factors that could decrease goods & meal delivery:






-  - Economic activity



SHIFTING NATURE OF FREIGHT

The development/possibility of autonomous trucking could radically shift the way goods are transported and delivered on long-haul trips. COVID-19 has renewed interest in autonomous trucking and investment as developers have come to learn that highways are much easier to navigate than city streets, the demand for autonomous passenger vehicles is currently down, and the pandemic has reminded people about the value and importance of supply chains. Truck delivery drivers helped keep stores stocked during the initial wave of panic buying and when nearly everything else was shut down.

Factors that could increase changing nature of freight:

-  + Goods and meal delivery
-  + Maturity of delivery business models
-  + E-commerce
-  + Interest in automated delivery devices
-  - Interest in passenger AV technology

Factors that could decrease changing nature of freight:

-  - Economic activity
-  - Number of brick-and-mortar stores
-  - Small businesses
-  - Venture capital funding



CHANGE IN DEMAND FOR WAREHOUSING SPACE

Prior to COVID-19, the demand for warehousing space, type of space, and location was changing alongside e-commerce and delivery patterns. Fulfillment centers are needed closer to city centers to provide customers with short delivery windows. Since the onset of the pandemic, some big box stores have closed brick-and-mortar locations in favor of converting them to e-commerce fulfillment centers.

Factors that could increase demand for warehousing space:

- ▲ - Number of brick-and-mortar stores
- ▲ - Small businesses
- ▲ + Goods and meal delivery
- ▲ + E-commerce.

Factors that could decrease demand for warehousing space:

- ▼ - Economic activity.



REDUCTION OF BRICK-AND-MORTAR STORES

Due to the acceleration of e-commerce and businesses such as Amazon and Walmart that offer a one-stop (online) shop for a huge variety of consumer goods, we were already projecting a reduction of brick-and-mortar stores prior to COVID-19. The economic devastation of the pandemic and increased desire for social distancing has quickly exacerbated this trend.

Factors that could increase the number of brick-and-mortar stores:

It is unlikely that any of the COVID-19 factors outlined in the introduction of this paper could increase the number of brick-and-mortar stores. However, additional factors that could still be adopted to increase the number of brick-and-mortar stores include government intervention (e.g. funding, vaccine production) or universal mask adoption (to make people feel more comfortable going into stores).

Factors that could decrease the number of brick-and-mortar stores:

- ▼ - Transportation and travel
- ▼ - Economic activity
- ▼ - Dining out and number of restaurants
- ▼ - Number of brick-and-mortar stores
- ▼ - Small businesses
- ▼ + Work from home
- ▼ + Goods and meal delivery
- ▼ + E-commerce
- ▼ + Fear of crowded public space



INCREASING INTEREST IN EXPERIENTIAL RETAIL

Prior to the onset of the COVID-19 pandemic there was an increased interest in experiential retail. Businesses were finding creative ways to attract customers to their stores to compete with the convenience of e-commerce and one- and two-day deliveries. In the context of COVID-19, this trend has been halted as stay at home orders and physical distancing are enforced. It remains to be seen whether this trend will pick back up “post-crisis”.

Factors that could increase the interest in experiential retail:

There are no factors, aside from a pent-up desire for social interaction, that will increase experiential retail during the pandemic.

Factors that could decrease the interest in experiential retail:

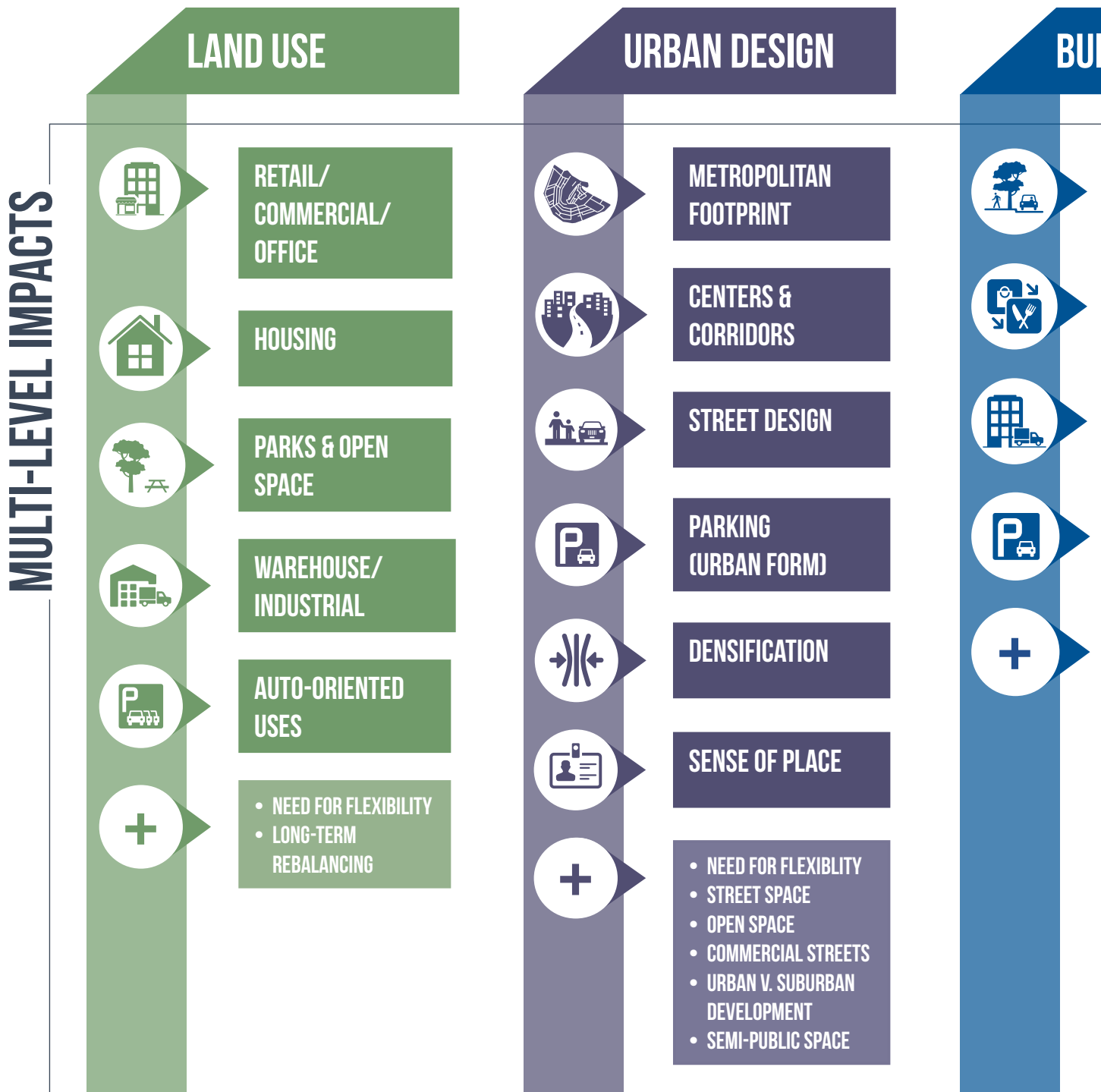
- ▼ + Goods and meal delivery
- ▼ + E-commerce
- ▼ + Fear of crowded public space
- ▼ - Dining out and number of restaurants,
- ▼ - Number of brick-and-mortar stores

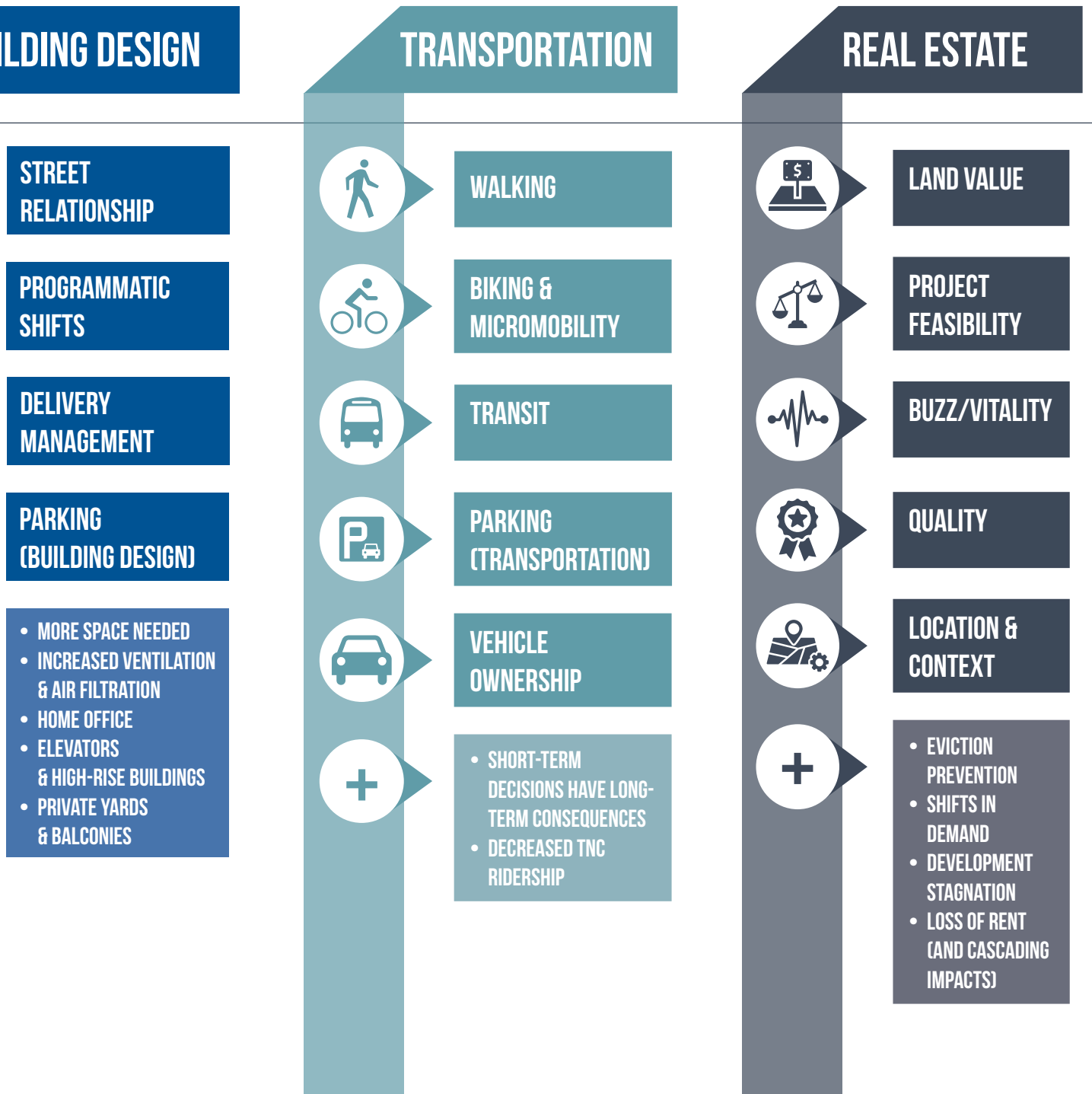


MULTI-LEVEL IMPACTS

This section details the multi-level impacts of the Urbanism Next Framework and the ways they have shifted due to COVID-19. It follows the original Framework structure comments on each section of the Framework. It also includes

additional considerations for responding to COVID-19, which are observations that were not included in the original Framework and that we believe are essential for responding to and recovering from the pandemic.





COVID-19 DISRUPTION EFFECTS ON MULTI-LEVEL IMPACTS

MULTI-LEVEL IMPACTS																		
	LAND USE					URBAN DESIGN					BUILDING DESIGN							
	RETAIL/COMMERCIAL/OFFICE	HOUSING	PARKS & OPEN SPACE	WAREHOUSE/INDUSTRIAL	AUTO-ORIENTED USES	METROPOLITAN FOOTPRINT	CENTERS & CORRIDORS	STREET DESIGN	PARKING (URBAN FORM)	DENSIFICATION	SENSE OF PLACE	STREET RELATIONSHIP	PROGRAMMATIC SHIFTS	DELIVERY MANAGEMENT				
COVID-19 DISRUPTIONS																		

										KEY	
TRANSPORTATION					REAL ESTATE					<div> <div></div>no/minimal impact <div></div>some impact <div></div>more impact <div></div>most impact </div>	
WALKING	BIKING & MICROMOBILITY	TRANSIT	PARKING (TRANSPORTATION)	VEHICLE OWNERSHIP	LAND VALUE	PROJECT FEASIBILITY	BUZZ/VITALITY	QUALITY	LOCATION & CONTEXT		
										Work from home (WFH)	+ INCREASED
										Driving alone	
										Goods and meal delivery	
										Maturity of delivery business model	
										E-commerce	
										Bicycle purchases and use	
										Tactical urbanism	
										Fear of crowded public space	
										Interest in automated delivery devices	
										Transportation and travel	- DECREASED
										Economic activity	
										Dining out and number of restaurants	
										Number of brick-and-mortar stores	
										Small businesses	
										Public transit ridership	
										Public transit services and revenues	
										TNC ridership	
										E-scooters and number of companies	
										Interest in passenger AV technology	
										Venture capital funding	

COVID-19 DISRUPTIONS

LAND USE

RETAIL/COMMERCIAL/OFFICE

The changing nature of travel, employment, and shopping brought about by the forces of change are only being exasperated by COVID-19 disruptions. There could be large drops in demand for retail, commercial, and office space as businesses face closures, demand for e-commerce increases, and offices remain vacant as more people work from home. This could lead to a surplus in the amount of land zoned for these uses.

HOUSING

Questions about whether people who can choose where they live will continue to locate in cities or move farther out into the suburbs have been reignited as many people can work remotely and are less physically tied to their places of employment than ever before. COVID-19 could also decrease the viability of increasing housing through infill due to fears of density/crowding or, conversely, could eventually increase the viability due to increased demands for affordable housing.

PARKS & OPEN SPACE

COVID-19 has highlighted the importance of open space to community health and wellbeing. Many cities around the world have used tactical urbanism methods to (at least temporarily) convert parking spaces and right-of-way for other public and quasi-public uses. This has likely only begun to unlock the potential of opportunities to reclaim parking spaces and street right-of-way for other open space uses.

WAREHOUSE/INDUSTRIAL

COVID-19 has increased demand for e-commerce which is likely to also accelerate demand for warehousing and distribution centers. It remains to be seen whether this development will primarily occur on industrial land or occupy more types of land uses moving forward. Some closed department stores and malls are already being converted into fulfillment centers, raising the possibility that warehouses will occupy more commercial and other land uses moving forward.

AUTO-ORIENTED USES

COVID-19 has increased driving alone and added to the uncertainty of the future of AVs. It is unlikely that land dedicated to auto-oriented uses will become available for redevelopment in the short-term.

Additional Land Use topics to consider in responding to COVID-19:

NEED FOR FLEXIBILITY

As COVID-19 has caused quick demand changes (such as use of public space for restaurants), zoning will need to be flexible to help address economic recession, assist small businesses, and address housing needs.

LONG TERM REBALANCING

Reduced demands for office and retail space could lead to a long-term rebalancing in the amount of land dedicated to these uses.



URBAN DESIGN



METROPOLITAN FOOTPRINT

COVID-19 has increased work from home and goods delivery and paused or shut down many of the arts and entertainment attractions that draw people to urban areas. These shifts could influence the footprint of cities as proximity to workplaces and goods/services may no longer be enough to attract people to dense city centers.



CENTERS & CORRIDORS

COVID-19 has threatened transit systems across the country due to decreased ridership and revenues. This could negatively impact whether new mobility supports transit to strengthen current nodes and corridors. This could lead to long-term issues of dispersal and continuous low-density development. Conversely, a shift to work from home could spur a need for vibrant neighborhood centers as workers look for amenities and services near their homes.



STREET DESIGN

COVID-19 has highlighted the importance of multimodal streets and many municipalities have accelerated their experimenting with temporary solutions to promote walking and biking. As cities make plans for future expansions, changes to their street network, and overall street-design, they should consider the lessons learned during the pandemic regarding demand for multimodal infrastructure and the continued geographic inequities and accessibility considerations.



PARKING (URBAN FORM)

We previously predicted the forces of change would lead to a reduced need for parking, which is now unlikely due to COVID-19 if the share of people driving alone increases. In addition, some parking lots have been converted into restaurant space to keep businesses afloat which reduces parking supply. These competing trends will most probably play out differently in different geographies and urban forms.



DENSIFICATION

COVID-19 has raised questions about the health and safety of urban densification and crowding (two separate issues that have been combined in much of the public discourse on this topic). In addition to how and where AVs and new mobility will increase or decrease development density, it remains to be seen how COVID-19 could shift public perception of density and the viability of infill development.



SENSE OF PLACE

Sense of place is coming into question in new ways as many of the business, shopping districts, and neighborhood amenities that tie communities together have been forced to shut down or reduce their services. The increase in e-commerce and work from home have made it easier for some people to be able to shop, live and travel from anywhere, but have simultaneously diminished the identity and vitality of many urban areas.

Additional Urban Design topics to consider in responding to COVID-19:

NEED FOR FLEXIBILITY

Especially in order to increase the amount and equitable distribution of parks and open spaces.

STREET SPACE

Questions remain about the equitable application of increased use of public right-of-way for private businesses and active transportation infrastructure, and the longevity of the changes

SEMI-PUBLIC SPACE

The area between buildings and the street is increasingly being used as a space for socially distanced interaction.

OPEN SPACE

Increased demand for open space in urban areas as a release for apartment living.

COMMERCIAL STREETS

If work from home continues, there may be a rise in demand for neighborhood commercial areas and having walking access to them.

URBAN VS. SUBURBAN DEVELOPMENT

If remote work and/or the need to stay at home persists, there may be a further demand for suburban areas that offer yards and larger houses for those who can afford it.

BUILDING DESIGN

STREET RELATIONSHIP

Prior to COVID-19, we predicted new mobility would lead to a reduced need for parking which could allow buildings to directly address and frame the street. However, COVID-19 has slowed any changes in parking demand, so current conditions are likely to remain constant. In addition, COVID-19 has created conditions where more businesses such as restaurants and retail want to expand into sidewalks and streets as outdoor extensions of their spaces to allow for physical distancing and airflow.

PROGRAMMATIC SHIFTS

Prior to COVID-19, we predicted new mobility would lead to reduced need for parking which could shift how ground floors are used. However, COVID-19 has slowed any changes in parking demand, so current conditions are likely to remain constant. However, there could be changes to spaces within the home (number and size of rooms) and how they are utilized with increased demand for home offices and outdoor spaces to accommodate people spending more time in their houses.

DELIVERY MANAGEMENT

COVID-19 has quickly accelerated the adoption of e-commerce and urban delivery. Increases in package delivery from e-commerce could accelerate changes to the ground floor of building including the incorporating of delivery lockers, and the enlarging and more prominent location of mailrooms and storage areas.

PARKING

COVID-19 has disrupted our previous predictions that new mobility would cause a reduction in the need for parking. There could be an increased demand for parking if people do not return to public transit and driving alone accelerates. However, if work from home continues and overall travel and transportation remains lowered, there could be a reduction in the need for parking and more parking spots could be adapted to meet the demand for outdoor public and private space.

Additional Building Design topics to consider in responding to COVID-19:

MORE SPACE NEEDED

If the need for social distancing within buildings persists, office spaces will need to be redesigned to include more space per person and reduced common areas.

HOME OFFICE

With the increase of work from home, the demand for dedicated home office spaces (increased number of rooms in housing) could increase.

ELEVATORS & HIGH-RISE BUILDINGS

As elevators and shared hallways pose increased risk for infection, the demand for high-rise buildings could diminish.

INCREASED VENTILATION & AIR FILTRATION

To limit exposure within buildings, spaces can adopt higher ventilation rates and increased air filtering.

PRIVATE YARDS & BALCONIES

Access to outdoor space has become a higher valued commodity and the demand for private outdoor space could increase as people spend more time at home.

TRANSPORTATION

WALKING

The importance of safe walking infrastructure has been highlighted as, during the pandemic, many people walk in their neighborhoods for exercise, errands and relaxation. The deployment of passenger AVs is likely to be delayed due to COVID-19, but considerations surrounding regulating pedestrian/AV collisions could remain for delivery AVs if the technology accelerates alongside demand.

BIKING & MICROMOBILITY

E-scooter companies were yet to prove profitability before the pandemic and their services have been widely disrupted, facing uncertain demand and removal of vehicles from some markets. At the same time, cities are prioritizing active transportation infrastructure, cycling use has risen dramatically, and people are searching for alternatives to public transit. It remains to be seen if shared micromobility systems featuring bikes, e-bikes, and e-scooters will continue their current rates of growth and how they might continue to integrate with other transportation modes.

TRANSIT

Decreased ridership due to fear of COVID-19 transmission, overall decreased travel, and increased work from home could lead to ongoing reduced service provision and financial challenges for transit agencies. This will severely challenge cities' abilities to keep transit, which is essential for meeting equity and environmental transportation goals, afloat. The future of transit service availability could largely depend on government recovery priorities and how it allocates aid funds.

PARKING (TRANSPORTATION)

AVs have been predicted to cause parking demand to drop dramatically. COVID-19 seems to have put a wrench in quick AV developments, and it is unlikely that parking demand will decline drastically in the short-term. If auto use increases, demand for office parking could increase substantially, particularly in central cities. For restaurants and local retail, parking may be converted to outdoor seating and retail space. Parking could also be designated for e-commerce pickup/drop off zones.

VEHICLE OWNERSHIP

New mobility (including AVs) might play a role in reducing the demand for vehicle ownership in the long-term, especially if AVs roll out in shared fleets. However, in the short-term COVID-19 could increase the demand for vehicle ownership if people remain afraid to take public transit and TNC use becomes more limited.

Additional Transportation topics to consider in responding to COVID-19:



SHORT-TERM DECISIONS HAVE LONG-TERM CONSEQUENCES

Immediate actions such as critical car purchases during the pandemic will affect behavior in the long-term. Influencing these short-term decisions to shape long-term outcomes will be a critical role of the public sector.



TNCS

Decreased ridership due to fear of COVID-19 transmission, decreased transportation and travel, and increased work from home could further strain profitability of TNC companies and influence business model shifts towards goods and meal delivery. In addition, there is an increased risk of infection for TNC drivers and COVID-19 has further exposed the vulnerabilities of gig-economy workers such as TNC passenger and delivery drivers.

REAL ESTATE



LAND VALUE

With unprecedented volatility, estimating the near- and long-term value of properties is difficult to ascertain. This, in itself, could limit real estate development and investment.



PROJECT FEASIBILITY

The predicted decrease in parking need and impacts to project feasibility will likely be delayed due to COVID-19. New disruptions to project feasibility have emerged including uncertainties in overall economy, demand for commercial and office, and a potential shift in housing location and amenity preferences.



BUZZ/VITALITY

The features and amenities that once drew people to live in urban areas have been disrupted and may face long-term consequences as the pandemic specifically limits social interaction. The entertainment industry could be in flux for some time,



QUALITY

As people spend more time in their homes and in neighborhood centers, the design quality of these areas could become increasingly important in attracting activity.



LOCATION & CONTEXT

With increased work from home and e-commerce as well as decreased number of small businesses, dining out and number of restaurants, and economic activity, COVID-19 could lead to a reduction in the importance of proximity to city centers. At the same time, an increase in working from home could increase the importance of proximity to active and attractive neighborhood centers.

Additional Real Estate topics to consider in responding to COVID-19:

+ SHIFTS IN DEMAND (BY SECTOR)

COVID-19 could lead to shifts in housing demand – particularly related to housing types (single family vs multifamily, low-rise vs high-rise) and tenure (ownership vs rental). Hotels, office, retail/restaurant, indoor malls could all see reduced demand due to shifts in where we work, shop and travel. Conversely, warehouses could see increased demand due to the shift in e-commerce.

+ SHIFTS IN DEMAND (BY GEOGRAPHY)

We could see shifts in demand in urban versus suburban versus rural areas if young people leave big cities or if there is less activity and fewer visits due to work from home. Small town and rural housing/retail demand could increase substantially.

+ STAGNATION OF DEVELOPMENT

Due to continued uncertainty as to the length and severity of COVID-19 impacts, there could be severe reduction of new development and investment.

+ EVICTION PREVENTION

There is an increased need to prevent an acceleration of the eviction crisis, while also balancing the stability of the overall real estate investment market. Government intervention may be one of the few ways to do this.

+ LOSS OF RENT (AND ITS CASCADING IMPACTS)

Economic recession could have a cascading impact as job losses lead to reduced rent payments, evictions, losses to property owners and eventually losses for banks and REITs.



CONSIDERATIONS OUTSIDE SCOPE OF FRAMEWORK

While Urbanism Next focuses on the topics above and in our Framework, we would like to acknowledge additional impacts of COVID-19 outside the scope of our typical work that we think are important to consider to gain a holistic understand of COVID-19 and its potentially widespread impacts. This section outlines these topics.

SYSTEMIC RACISM

The COVID-19 pandemic has uncovered and exacerbated many of the health, income, access to parks and open space, and policing inequities BIPOC communities already faced due to systemic racism.

ENVIRONMENTAL IMPACTS

Reduced travel and manufacturing had immediate, positive impacts on air quality in metropolitan areas internationally, but as travel and manufacturing have returned so has the pollution they create. This could be exacerbated if more environmentally friendly travel modes, such as transit, are greatly diminished.

ENVIRONMENTAL JUSTICE

Environmental justice issues such as heat islands, air pollution, and urban noise have surfaced as people are forced to spend more time at home and in their neighborhoods.

TRAVEL/TOURISM

The future of travel/tourism remains uncertain and places that have historically depended economically on tourism are facing major challenges. Recreation and business travel could continue to be severely reduced as people adapt to new COVID-19 routines.

INTERNATIONAL BORDERS

Many international borders have closed throughout the pandemic and could remain closed for unknown lengths of time. This will likely have long-term impacts on many sectors and on international relations.

DIGITAL DIVIDE

COVID-19 has made access to technology and internet even more integral to daily life and meeting our basic needs. This has put a spotlight on the uneven access to technology in the US and throughout the world/

PARENTING

Closed schools and childcare facilities have left many parents struggling to manage working (remotely or not) while caretaking for their children and trying to provide them with education.

REMOTE EDUCATION

Remote education didn't go over very well in the spring of 2020, and now it looks more and more like it will continue in many places into the 2020-2021 school year. This could have lasting and un-equal impacts.

UNSAFE LIVING CONDITIONS

Home is not always a safe place for many people (who have the privilege of having a home) due to physical, verbal, or emotional abuse or unsafe living conditions. People experiencing homelessness are uniquely vulnerable, especially when they lack access to health or sanitation services.

CONCLUSION

Not knowing everything about the future does not mean we do not know anything about the future. While we cannot predict exactly what the future will hold in terms of the areas we research and the degree of impact COVID-19 will have on them, it is clear that this pandemic will shape the future of how we live in cities in some ways. This paper is meant to serve as a framework for understanding the COVID-19 disruptions we have identified and the potential changes they may cause to the forces of change and first- and multi-level impacts we study.

We hope this paper can help to illustrate the connections between areas such as land use, transportation, and urban design and demonstrate the cascading impacts that each of the COVID-19 disruptions could have. Policymakers will have varying levels of influence over the outcomes of each of these disruptions, and we hope this can be used as a toolkit to help shape the future towards outcomes that promote the public good.




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