

Future of Cities & Future of Mobility

Uber and the post-
COVID Metropolis

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Acknowledgments

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This document was created for an internal audience at Uber and should not be publicly distributed.

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Introduction

In the post-COVID environment, Uber's success is linked to the successful recovery of cities.

Since early 2020, the COVID-19 pandemic has drastically reshaped the character and routine of daily life across the globe. Individuals and companies have witnessed fundamental changes in how we work, live, and move, prompting a broad reassessment of the future of cities and the future of mobility across a variety of contexts. This white paper, which was developed by WXY and commissioned by Uber Policy and Research staff, presents an initial attempt to understand these trends and capture what they may mean for Uber as a company whose business is heavily entrenched and intertwined with the future shape of cities. The scope of this paper is intentionally broad. It reflects on past literature, trends, and Uber ridership data from the past several years, while also striving to project surface transportation trends into the future.

Two primary questions drove this effort:

- How will cities change after the pandemic?
- What is Uber's role in reacting to and shaping those changes?

We often think of mobility and transportation changes as associated with technological leaps, but a range of other external factors such as natural disasters and public health crises have also altered our cities and by extension our transportation systems. Economic changes tend to lead to changes

in land use and behavior, and in turn, impact how and where people live and travel. The relationship between public health, land use, and transportation policy is well documented. In the United States and Europe, a series of severe cholera epidemics in the mid-19th century and the typhoid, flu, and fever epidemics of the early 20th century fueled movements to deconcentrate and depopulate congested urban centers into a constellation of industrial "garden cities" at the periphery. Masking deeper fears around the mixing of classes and especially in the United States, racial and xenophobic biases, policymakers created a framework for land use and transportation that segregated land uses, decreased density, and subsidized home ownership in peripheral environments beyond the city (for white, middle-class families). While there are many exceptions to this pattern globally, especially in Asia and certain European countries, public health concerns and entrenched biases against density continue to drive poor transportation and housing decisions in emerging economies, replicating the negative environmental and social effects that many nations are actively working to correct.

In the post-COVID environment, Uber's success is linked to the successful recovery of cities. During the height of the pandemic, the shift to remote work drastically reduced the volume of travel, largely erasing much business travel and reducing the number of meetings conducted in person. In some cities, trip volumes plummeted over 90%. While some of these trends may be temporary, others represent fundamental changes to how people will work and live. While it is likely that many trips will bounce back by late 2021, countless companies have made strategic decisions around their real estate

portfolios that will have significant consequences for traditional central business districts and urban areas. These changes will impact Uber's core business.

Using data drawn from eight cities of different sizes and types across the globe, this white paper considers how Uber's business transformed during the pandemic and posits a series of new frontiers for the platform to consider looking forward. Research focused primarily on North America, but considers global implications and trends in parallel. This research focused primarily on surface transportation and Uber's Rides platform, but considers other aspects of Uber's platform and business in parallel, with a focus on micromobility and carsharing, and relatively less attention given to the transit business and automation. This assessment is broad in scope, considering not only the Uber platform's role as a reliable service to get people and goods from point A to point B, but also its potential role in shaping large regional travel patterns, serving different segments of the population, and augmenting the resiliency of cities and their mobility networks.

The paper begins with a brief executive summary highlighting key findings and trends for the platform. The second section analyzes current mobility and urban development trends in the post-COVID context. This is followed by a discussion of Uber's role in the mobility ecosystem and a presentation of high level takeaways from data analyzed between April 2019 and March 2021. Additional resources, data, and trends analysis is provided in the appendix of this report.

Executive Summary

Summary

Since 2012, Uber has played a significant, niche role in urban transportation and logistics markets. Across its multiple services, the Uber platform has emerged as a reliable option for moving things from point A to B and an increasingly integral part of the mobility ecosystem in many urban areas worldwide. Many people across a range of geographies and demographics rely on the platform for its convenience and as a form of mobility “insurance” when personal car travel, transit, or non-motorized travel are unavailable or inconvenient. Eroding usage of publicly-subsidized transit (in the US), competitive pricing, and concerns over carbon emissions and over-usage of single-occupancy vehicles have collectively helped fuel Uber’s growth.

While Uber has transformed a mobility industry that was falling short of consumer needs, policy frameworks that govern rideshare have evolved and adapted more slowly. Over the past decade, governments have created new regulations, data sharing and privacy agreements, and operating requirements for Uber and other rideshare businesses. While these new regulations have sought to safeguard the public interest, in the United States and many other countries, transportation policy as a whole has failed to address broader issues of equity and access in mobility, including the continued dominance of single-occupancy vehicles, underfunded and mismanaged public transit systems, and poor land use decisions that propagate over-reliance on car ownership.

During the COVID-19 pandemic, Uber witnessed a significant, if temporary, shift in its core business. For the first time, UberEats overtook the Rides business in overall volume and revenue. With sharp declines in ridership and fundamental changes in travel behavior that lasted over a year, Uber stands at an important

inflection point as a business and as a mobility platform.

While travel behaviors changed drastically during the pandemic, researchers vary in their long-term post-COVID projections for cities. While some companies have made headlines by announcing permanent work-from-home options, others have yet to fully develop policies around remote work, creating uncertainty in commercial real estate markets and in cities that depend on revenues from offices and the businesses that fuel them. As transit agencies grapple with changing travel trends and falling revenues, federal and state subsidies have helped maintain levels of service, with the hope of recovery in sight. At the same time, the real estate market, especially, in outlying suburban areas that offer more space, has burgeoned, with more first-time home buyers entering the market than at any time since the 2008 recession. Patterns of consumption exacerbated by COVID, reflected in rising rates of on-demand delivery and e-commerce, have slowed the recovery of retail in both suburban areas and downtowns. While many of these trends have yet to fully bear themselves out, changing land use and location trends have the potential to further disrupt Uber’s core business, yet also open the company to new products, platforms, and service models.

The key findings on the following pages summarize, at a high level, critical opportunities for Uber in the post-pandemic era. Not all of these findings have a clear policy and technology trajectory, yet all of them are important areas that merit further research, investigation, and consideration in relation to Uber’s business. These findings are followed by a series of visualizations that explore emerging paradigms and trends defining the future of cities and mobility.

Case Studies

This paper examined how COVID-19 changed urban travel patterns in cities and regions of different types, using Uber data from April 2019 to March 2021 for eight global case studies.

These eight cities reflect a range of different urban typologies, from large, high-density, transit-rich cities to smaller, transit-poor areas.

1 New York City, USA During the height of the pandemic, New York City saw an almost 90% decrease in trips in both Uber and public transit. While trips have since recovered, Vehicle Miles Traveled (VMT) have outpaced recovery in transit and Uber ridership. The pandemic revealed new trends and ridership patterns, with more essential workers and low-income areas relying on Uber to supplement depleted transit service and to get to work at core businesses like hospitals and fulfillment centers.

2 Cincinnati, USA Cincinnati witnessed uneven patterns of ridership during the pandemic, with overall rides falling precipitously and then recovering slowly in different parts of the region. Whereas many downtowns have struggled to recover after the pandemic, downtown Cincinnati, which is mixed-use and has an active entertainment district, has begun to come back to life, offering some hope to other downtown areas.

3 Phoenix, USA A heavily sprawled, decentralized city with wide gaps between rich and poor, Phoenix saw many lower-income areas rely on Uber as a way to get to and from work during the pandemic. While Phoenix's outlying suburban shopping districts and industrial parks have begun to see recovery, the downtown remains quiet and has yet to witness an uptick in rides.

4 Waco, USA Waco, a transit-poor city and college town, saw a significant drop-off in Uber trips as college students left campus and businesses shuttered. As students returned, rides have gradually increased, but have yet to return to pre-pandemic levels or return to the city's downtown area.

5 London, UK Like New York, London saw a precipitous fall in ridership during the height of its pandemic, with an emptied central business district that is slowly coming back to normal. Essential workers, many of whom live at the more affordable outskirts of the city, continued to use Uber to supplement transit.

6 Hong Kong Like many other cities in Asia, Hong Kong saw a faster recovery in trips, including trips to its traditional central business areas. Trips saw a significant rise in overall average distance early in the pandemic, but later returned to normal. With significant experience in containing past pandemics, Hong Kong's trends follow a much different trajectory than the other case studies.

7 Sao Paulo, Brazil Sao Paulo has witnessed an incredibly slow recovery in its downtown. As trips have increased in other neighborhoods and outlying districts, the central city has remained far below normal levels, pointing to the long-term implications of polycentric urban form and peripheral trip making.

8 Johannesburg, South Africa Johannesburg exhibited longer than normal trip distances during the pandemic as a result of its almost complete lockdown. As trips have recovered, lower income populations in Soweto have made up a higher proportion of riders than before the pandemic, revealing how the pandemic shifted overall ridership geographies in many places.

Key Findings

1 Meeting the Needs of Low-income Riders

In most of the cities studied, low-income riders made up a significantly higher percentage of riders after the pandemic than before.

Lower-income census tracts (used as a proxy for lower income riders) represented a significantly higher percentage of ridership during 2020 as compared to 2019. In several cities, low-income riders far outnumbered higher income riders, pointing to important trends in Uber ridership, implications for transit agencies, and public policy concerns around land use and car ownership.

While Uber has historically appealed to “choice” riders with expendable income in large, dense cities, including many who choose not to own a car as a lifestyle decision, this analysis indicates that riders in some geographies are “captive” riders who lack a reliable alternative to using Uber and other rideshare services. In this context, Uber serves as an expensive form of mobility “insurance” in times and places where transit service is nonexistent, intermittent, or unreliable.

Uber has an opportunity to provide municipalities and transit agencies with regular reports on low-income ridership as a way of forming strategic partnerships for mobility cost-burdened riders.

Uber could also consider adopting specialized programs targeted at lower-income riders and workers to address barriers to entry that may exist for lower-income populations using Uber.

2 Supplementing Transit for Essential Work

During the pandemic, many rides went to destinations with clusters of essential businesses, including hospitals, large distribution centers, and big-box stores like Walmart and Target.

While many central areas went quiet during the depths of the pandemic, other destinations, such as major hospitals, large distribution centers, and certain big-box stores, saw increases in ridership, especially in areas with a lack of transit or poor off-peak transit service. The implications of this trend are two-fold.

First, in contrast to the critique of many policymakers, Uber is serving places that are not connected, or poorly connected to transit and is supplementing service for increasingly budget-constrained transit agencies.

Second, as traditional retail businesses continue to falter, the geography of commerce is increasingly shifting in favor of new distribution and logistics centers close to, but not in the core of, urban areas.

Uber could explore the design and development of specific partnerships with essential businesses like hospitals and distribution centers that have particular trip types and needs. Much like Uber’s existing airport partnerships, more tailored relationships could help incentivize growth within certain sub-markets while providing better service to specific geographies and worker populations.

3 Potential for Mixed-use Areas, Uncertainty in CBDs, Growth in Exurbia

While Uber trips have partially recovered since the worst of the pandemic in some cities, central business districts (CBDs) have yet to fully recover their trips, while suburban and exurban areas have boomed.

In April 2020, cities saw a consistent pattern in the time-of-day distribution of trips. Trips made on weekend nights fell precipitously in favor of increasing trips made in the middle of the day. As lockdowns eased, trip time distribution gradually returned to normal. At the same time, however, the number of trips going to traditional central business districts, which are in many places dominated by offices, remained far lower than normal. The reasons for disappearing CBD-bound trips are nuanced and reflect the persistence of remote work combined with declines in tourism and convention business, among other factors. While CBD ridership may eventually recover, this trend points to an important indicator for the resiliency of Uber ridership- mixed uses. Mixed use areas with a combination of residential, office, and entertainment functions, retained more trips than single-use office districts. Outlying mixed use centers easily accessible by car also recovered more quickly, indicating a divergence between traditional central business areas and increasingly competitive mixed-use destinations.

Uber’s business is heavily dependent on vibrant, dense, and active mixed use areas. Uber should work with cities to push for the conversion of parking to other uses via partnerships and to designate more areas for curbside loading and delivery. At the same time, Uber could create a strategy for bolstering usage and connections in outlying suburban and exurban geographies.

4 Car Ownership is the Shared Competitor

While VMT has largely recovered (and increased in some places), transit ridership and Uber ridership continue to lag in their recovery.

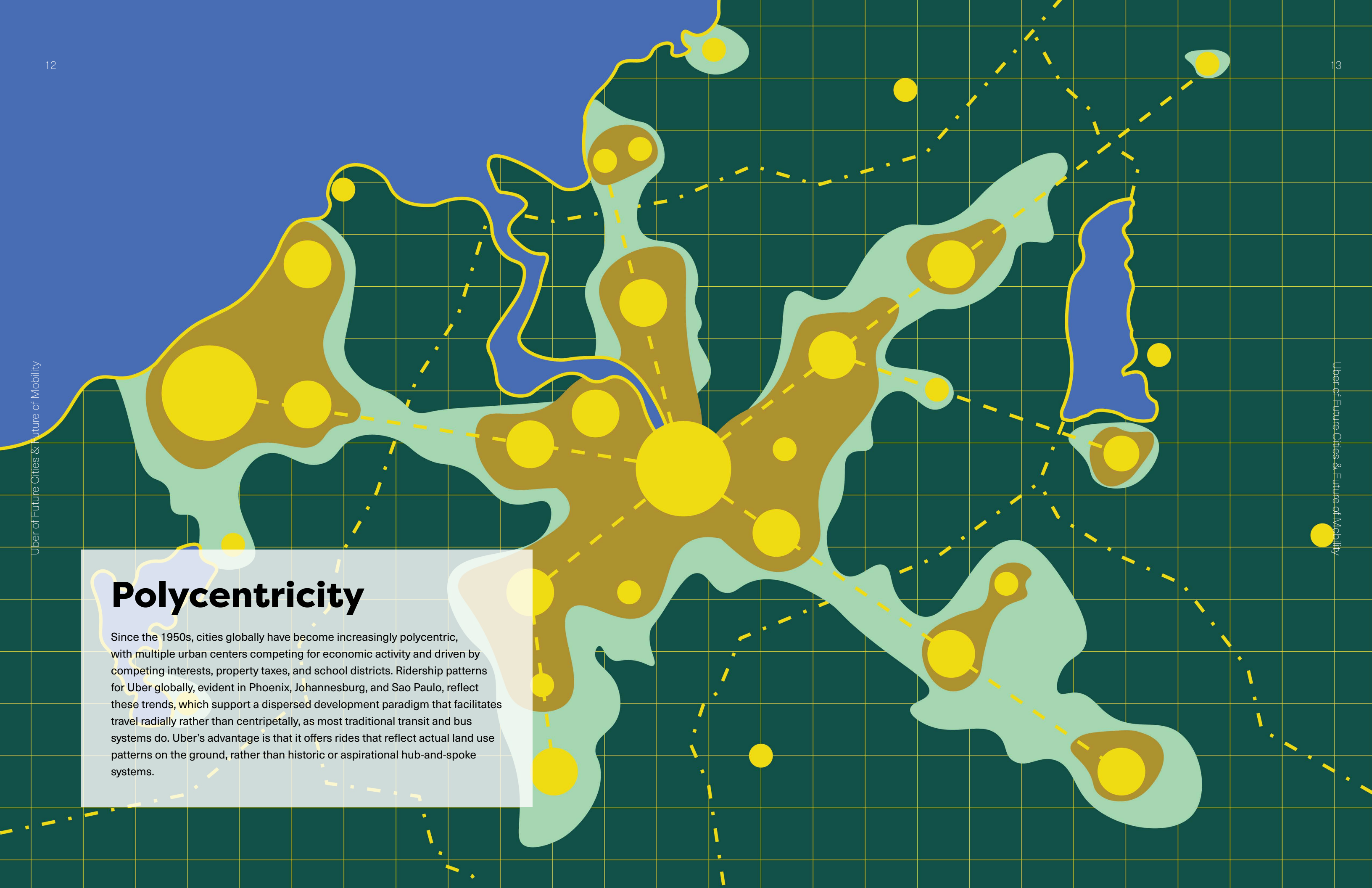
The number one indicator of Uber ridership is a lack of access to a vehicle. In the United States, while Uber has been a focal point for congestion, oversight, and regulation, Uber remains a fraction of vehicle trips made every day. Car ownership, evidenced by rising car ownership rates post-pandemic and rising VMT, remains a persistent shared competitor to both public transit and Uber ridership. This is borne out by recent data showing the fast recovery of VMT and the lagging recovery of transit and Uber.

In many places, car ownership is a necessity, created by poor land use decisions and other policies that disincentivize transit. Nonetheless, Uber continues to play a critical role as a bridge between owning or renting a car and taking transit.

Uber could foster partnerships with companies that can fill the gap between transit and traditional car ownership, including carsharing (round trip and point-to-point), shared car ownership models, car rental, and micromobility. Uber could make all of these options available on the app and test different subscription models, incentive and loyalty programs to bolster their appeal to different population segments.

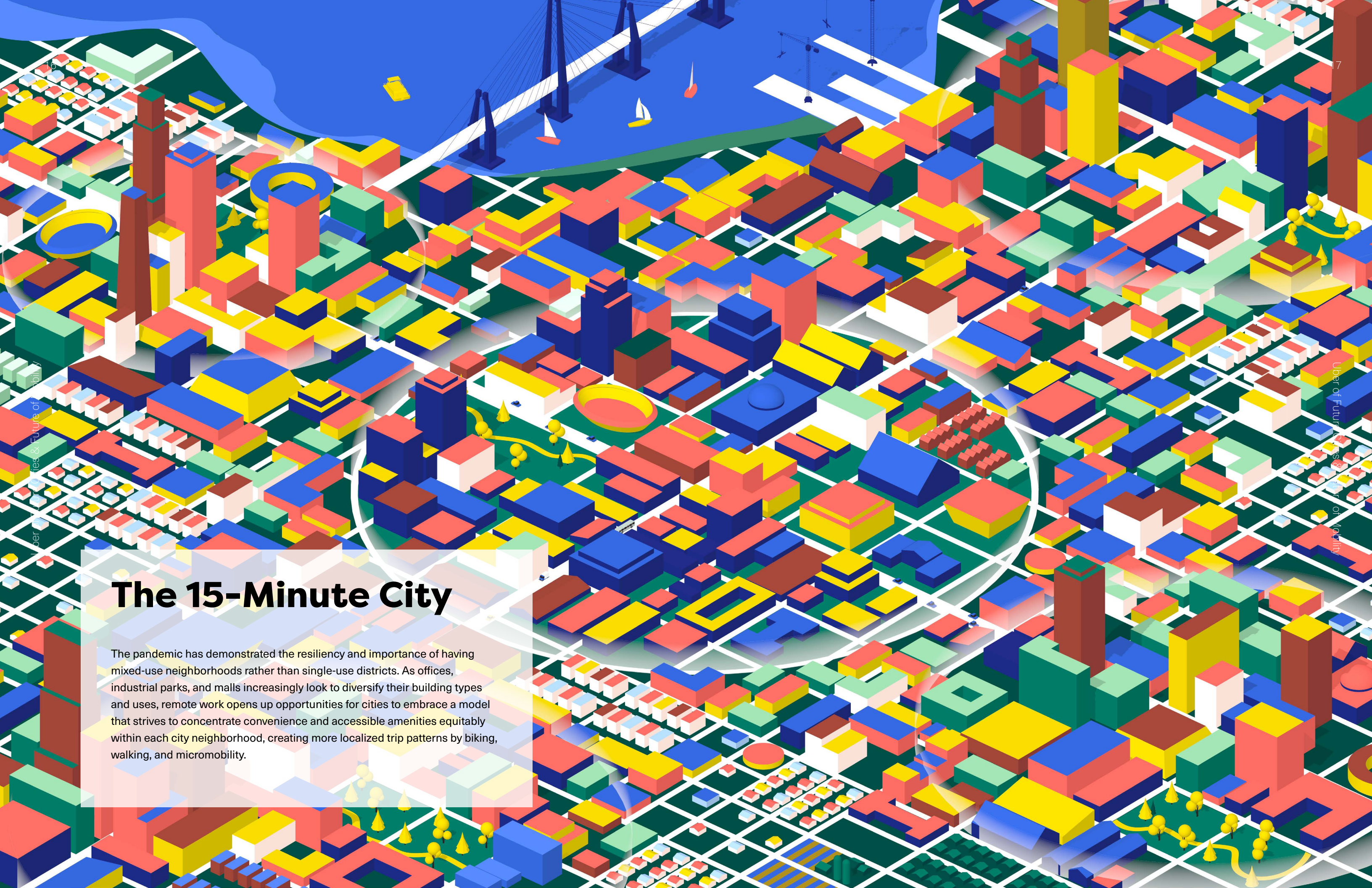
Polycentricity

Since the 1950s, cities globally have become increasingly polycentric, with multiple urban centers competing for economic activity and driven by competing interests, property taxes, and school districts. Ridership patterns for Uber globally, evident in Phoenix, Johannesburg, and Sao Paulo, reflect these trends, which support a dispersed development paradigm that facilitates travel radially rather than centripetally, as most traditional transit and bus systems do. Uber's advantage is that it offers rides that reflect actual land use patterns on the ground, rather than historic or aspirational hub-and-spoke systems.



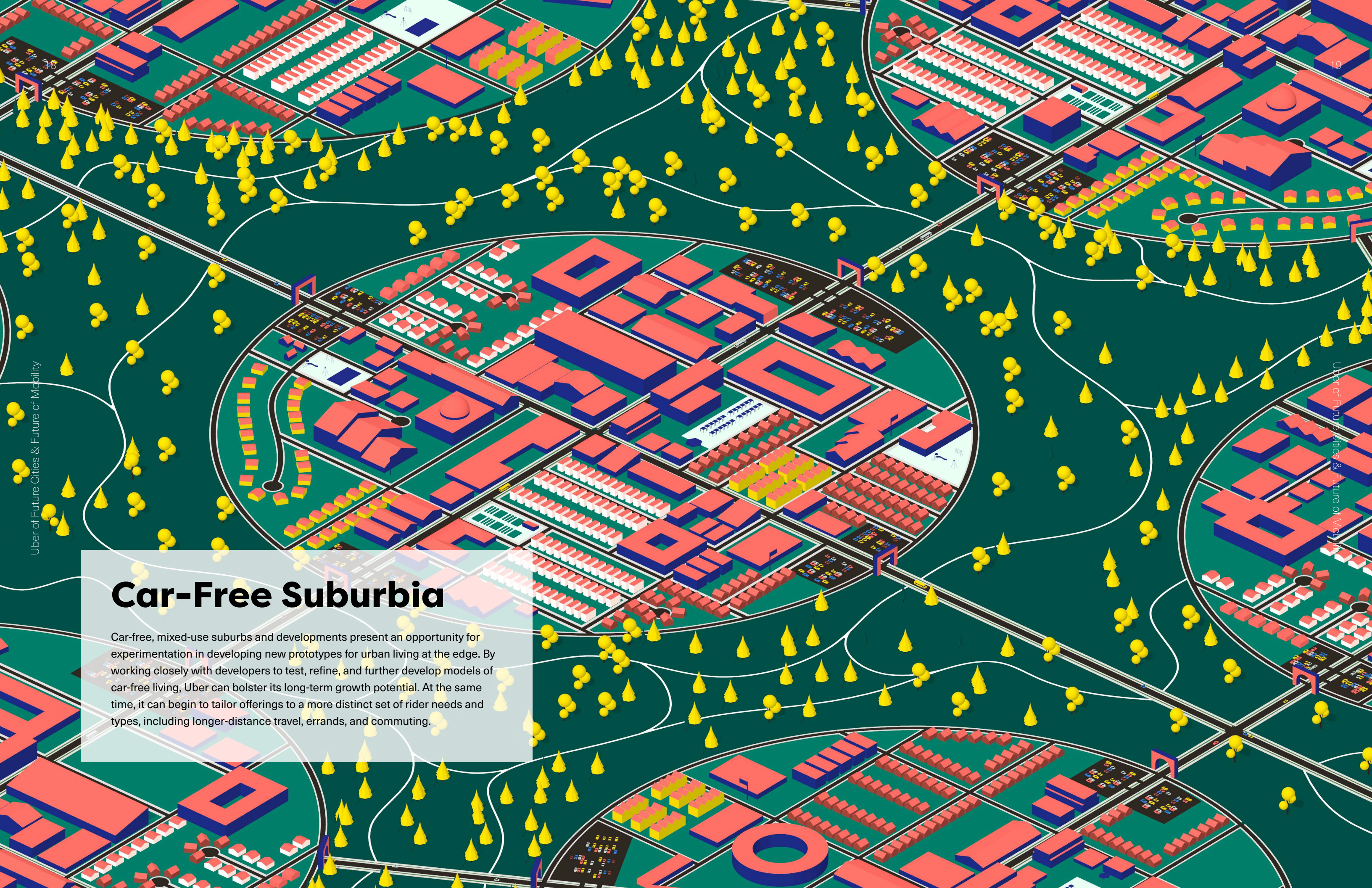
Mobility-oriented Development

Whereas many cities around the world historically grew up around rail, many today are characterized by deconcentrated, auto-dependent patterns of development. To compete with car ownership, Uber will need to confront long-standing, underlying deficiencies in urban land use planning, which increase car dependency and discourage densification. Creating multi-nodal mobility-oriented (rather than purely transit-oriented) development hubs can help developers achieve density beyond the transit shed.



The 15-Minute City

The pandemic has demonstrated the resiliency and importance of having mixed-use neighborhoods rather than single-use districts. As offices, industrial parks, and malls increasingly look to diversify their building types and uses, remote work opens up opportunities for cities to embrace a model that strives to concentrate convenience and accessible amenities equitably within each city neighborhood, creating more localized trip patterns by biking, walking, and micromobility.



Car-Free Suburbia

Car-free, mixed-use suburbs and developments present an opportunity for experimentation in developing new prototypes for urban living at the edge. By working closely with developers to test, refine, and further develop models of car-free living, Uber can bolster its long-term growth potential. At the same time, it can begin to tailor offerings to a more distinct set of rider needs and types, including longer-distance travel, errands, and commuting.

Multi-modal Ecosystems

As more people adopt new transportation choices, from bike share and scooters to rideshare and transit, it will become increasingly important to create both physical and digital spaces where these services are integrated, legible, and accessible. The gas station of the future may be more of a neighborhood mobility hub that combines electric vehicle charging, shared mobility, and transit access as opposed to a fueling outpost.



Urban Distribution

As mobility options diversify, on-demand delivery intensifies, and automated, shared, and electric vehicles become more common, new types of civic infrastructure may emerge that combine and foster multiple functions. These future urban distribution hubs could serve multiple purposes, as major mobility points as well as civic anchors, productive environments, and transit hubs. Existing assets, like parking garages and malls, are already beginning to experiment with these kinds of transformations into multi-purpose facilities.



Curbside Activation

The pandemic shifted how we think of streets- from static assets occupied by on-street parking into dynamic public spaces with the potential for time-of-day changes and management. As technology and data enable new ways of coding and managing streets, Uber has an opportunity to help cities manage curbside congestion, foster new forms of street design and placemaking, and provide new ideas for reinventing the curb.



Emerging Paradigms

Overview

With a changing public health landscape, shifting travel patterns, new work routines, remote learning, and increased reliance on on-demand goods delivery, many cities and regions have undergone a decade of technological evolution in a matter of months.

Cities today are witnessing processes of urban change and dislocation unseen since the mid-20th century. With a changing public health landscape, shifting travel patterns, new work routines, remote learning, and increased reliance on on-demand goods delivery, many cities and regions have undergone a decade of technological evolution in a matter of months. At the same time, basic ideas about how we use streets and public spaces have come into question, challenging fundamental norms of street usage, creating new types of businesses, and opening the way towards a different potential future for cities and mobility systems. Against the backdrop of this changing urban landscape, Uber has experienced its own changes, including a shift in the importance of the Eats business, reflecting shifting travel patterns and routines amid the pandemic.

In order to project a new urban future, it is critical

to understand the context and the implications of these profound changes in time. Using primarily North American research, this chapter outlines key findings, predictions, and assessments for trends in work, retail, development, curbside management, and mobility. The collected findings are based on a comprehensive literature review including studies conducted just prior to and during COVID along with expert predictions of how cities may change in the post-COVID context. A full synthesis of this material is included in the appendix

This analysis provides a snapshot of current trends, with a focus on the North American context. Some subject areas, such as transit and automation, are not dealt with in depth here since they have been thoroughly explored in prior studies and white papers by Uber. Each section is synthesized into a set of key findings that reflect a potential outlook on the future of the city and its potential impacts on Uber.

Future of Mobility

Key Finding: Mobility options are diversifying, growing smarter, and more app-enabled, allowing people to consume new mobility in more flexible ways and with greater ease than ever before.

1 Transit Hardships

The COVID-19 pandemic has exacerbated pre-existing declines in public transit ridership, endangering underfunded transit systems and hurting the most vulnerable riders.

2 Shared Mobility Growth

Although public health concerns have contributed to a surge in demand for private vehicles, the market for shared mobility is still poised to see continued growth.

3 Consolidation & Integration

If mobility services consolidate into unified trip planning and payment systems, operators may be positioned to collect more holistic user information on a larger scale than ever before, sparking concerns about data-sharing and privacy.

4 Dynamic Pricing

Advanced mobility and congestion pricing may be critical to encouraging greater equity as well as a sustainable balance of use intensity between different modes.

5 Electric Micromobility

Bikes, scooter, and e-bikes saw significant gains during COVID, signaling a shift towards private, clean mobility options that offer additional flexibility.

6 Persistent Car Ownership

Car ownership rates remain high and pose a persistent and lasting challenge to all kinds of shared mobility, including rideshare and transit.

OUTLOOK

Potential Outcomes

- Cities see continued declines in transit ridership as public health concerns persist and other options become more competitive.
- Continued growth in the shared mobility market, with ridesharing, scooters, bike share, and other services expanding and diversifying.
- Increasing consolidation of mobility services and trip planning services, with payment integration and mobility bundles.
- Adoption of Mobility-as-a-Service models for integrated payment, through trip planning apps, municipally backed applications, and ridesharing applications.
- Increasing adoption of dynamic pricing applications to shift travel behavior and create a real-time market for transportation.



Multi-modal Ecosystems

The pandemic saw a relatively sharp rise in the use of bikes, bike share, scooters, mopeds, e-bikes, and other micromobility services, especially in denser, transit-rich cities. While the long-term demand for these services remains in question, mobility options have continued to become more diverse and competitive, especially for short, local trips that were traditionally made by car or transit. As these services evolve, transportation planners will need to carefully consider how these services are collectively accessed, managed, and coordinated in relationship to traditional vehicle and transit modes. Roughly half of car trips are less than 3 miles in length, but most trips on the Uber app are 4-7 miles on average, pointing to a missing market that Uber could take advantage of through new partnerships and offerings.



Transit Partnerships

Declining ridership, coupled with concerns over safety and proximity, have hurt already struggling transit services, especially in the United States. While federal subsidies have saved many transit systems in the near term, fundamental changes in travel behavior may alter the basic underlying logic behind many hub-and-spoke transit systems, resulting in further need to shift from traditional bus and rail services towards more dynamic mobility-as-a-service models. The pandemic has been a wake-up call to transit agencies that they need to diversify and adapt their business to meet customer needs and provide more reliable, flexible, and frequent service. The Uber platform can be the “bridge” or “glue” between the need for all day higher capacity service and that of the more specific uses case needs on the edges, including evenings and weekends.

Parking & Curbside Management

Key Finding: Since the start of COVID-19, parking spaces around the country have sat empty. Meanwhile, cities have reappropriated streets, parking and curbside space as public seating, dining streets, and other uses. These experimental pilots likely offer a glimpse at the future of parking in American cities—which is expected to shift considerably as a result of new approaches to curbside management and parking minimums, shifts in commuting habits, and the longer-term adoption of autonomous vehicles.

1 Parking Conversion

Parking spaces of all kinds may decrease in response to changes in mobility, development, and commuting, as well as the rise of autonomous vehicles and charging infrastructure.

2 No More Minimums

There is an over-abundance of parking in the United States, a trend perpetuated by zoning and parking minimums.

3 Searching for a Spot

Americans spend a sizable amount of time searching for parking, and this contributes to pollution and congestion in cities.

4 The Advents of AVs

Autonomous vehicles may significantly impact the usage and design of on- and off-street parking.

5 Curbside Reclamation

Cities are increasingly recognizing the need to expand the use of the curbside beyond personal vehicle parking.



Curbside Activation

Cities worldwide witnessed an unprecedented rise in curbside outdoor dining, open streets, and placemaking during the pandemic. For many places, these changes have opened the doors to a variety of new experiments in curbside activation and management, including pick-up/drop-off areas, loading/unloading zones, and other community services. New technologies and data are opening the door to dynamic curbside pricing, safety, and congestion management strategies that can help convert swaths of curbside parking to more productive uses that take full advantage of this valuable civic asset.

OUTLOOK

Potential Outcomes

- Changing paradigms of curbside management and activation open the door to enhanced pick-up drop-off zones and other uses.
- Dynamic curbside pricing and curb “coding” create opportunities for more dynamic pricing and usage of the curb, efforts that could be supported by Uber’s knowledge of curbside activity and congestion.
- Elimination of parking minimums open the way to new development, creating denser cities and more active downtown districts.
- Automated vehicle uptake causes a rethinking of traditional parking structures to house AV fleets and other functions.
- Parking is now the dominant land use in most cities. Uber should focus local policy pressure on eliminating parking minimums and free parking. Parking availability at the destination is directly correlated with the choice to use Uber instead of a personal car.

Transportation Equity

Key Finding: COVID-19 highlighted the importance of addressing transportation inequities and revealed the prominent role rideshare may play in filling in transportation gaps. During the pandemic, public transit ridership plummeted, impacting low-income people and people of color who rely disproportionately on these services.

1 Longer, fewer commutes

Low-wage workers tend to face longer and more difficult commutes to work.

2 Car Ownership & Equity

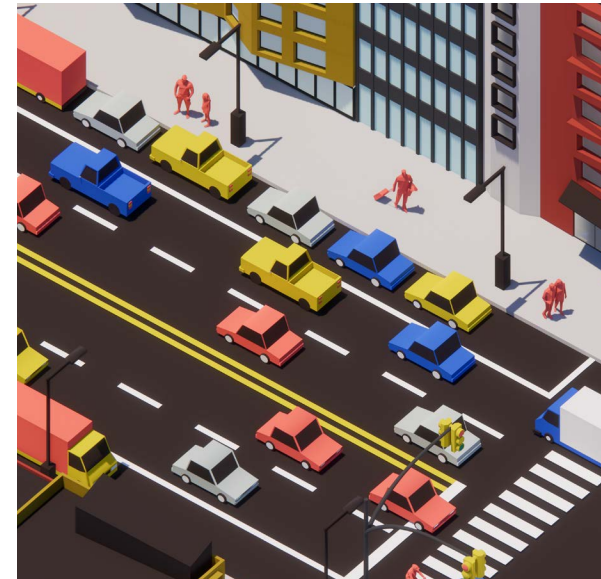
Low incidence of car ownership is the greatest predictor of rideshare ridership rates in North American cities. People of color and low-income workers are less likely to own personal vehicles and more likely to rely on public transit.

3 Declining Bus Ridership

In the United States, decreases in bus ridership and service raises significant transit equity questions.

4 Low-income Ridership

Rideshare companies saw significant increases in low-income ridership and essential worker ridership during the pandemic.



Mobility “Insurance”

Uber plays a critical role as a ridesharing platform for low-income households without access to a car (or with limited access to a car). During the pandemic, when transit agencies cut services (and many sought distance from other passengers), many lower-income households and essential workers substituted or supplemented those trips with the Uber app. The long-term implications of this trend remain unclear, but at a basic level, they point to a divergence in how elastic demand is for Uber among different income groups and populations as well as the different role that Uber plays for different sub-markets. In certain areas, this data reveals that the Uber platform is actually attracting “captive” riders who have no alternative to using Uber, a troubling public policy problem that municipalities and transit agencies need to be aware of. For Uber, this trend underscores the importance of UberPool as a bridge between transit and rideshare.

OUTLOOK

Potential Outcomes

- Ridership among lower income groups increased during COVID. Growth in lower-income rideshare ridership is projected to increase, as transit agencies curtail service and jobs continue moving to the periphery.
- Car ownership is a critical indicator of Uber usage, especially among lower income workers reliant on off-peak transportation service.
- Bus ridership may continue to decline, resulting in patterns of increased rideshare reliance and cost burden on lower income households.

Future of Work

Key finding: As remote work becomes increasingly prevalent, shifting trends may highlight deep inequities in the U.S. economy as well as transportation systems and mobility. Changes to the way we work will have profound impacts on the shape and size of cities, affecting where people live, how they travel, and the distribution of land uses in metropolitan areas.

1 Class Bifurcation

Hybrid and remote work will become increasingly prevalent across professional industries and will highlight deep pre-existing inequities in U.S. and global economies.

2 Multi-Hub Office Locations

Future work environments may scatter into on multiple 'hubs' rather than fewer centralized operations, decreasing office demand in all top U.S. markets.

3 New Live-Work Models

Cities across the United States are investing in live-work models and remote work incentives to attract mobile and highly-skilled residents.

4 Evolving Urban Form

An environment of increased remote working is likely to have great effects on the scale and urban form of cities and entire regions, including increased demand for local retail and mixed-use amenities.



Polycentricity

During the pandemic, trips on Uber largely disappeared from central business districts and have yet to fully return. Mirroring urbanization patterns that have become more prevalent over the past fifty years, Uber's platform reflects increasingly polycentric urbanization with less focus on central business districts and more focus on neighborhoods. The distribution of trips with Uber during the pandemic also mirrors the changing role of downtowns as a center of shopping and retail, as many trips have shifted towards outlying business clusters and distribution centers where workers package and handle goods for delivery. Within this new paradigm, income distribution is an increasingly important factor in determining Uber usage, as poverty increasingly moves into more suburban and car-dependent areas, even as car ownership rates remain the same.

OUTLOOK

Potential Outcomes

- The adoption of hybrid remote work models results in an overall decrease in the Rides business, including less business travel and airport travel for work.
- Fewer trips to and from traditional single-use Central Business Districts deconcentrate Uber's business and make cities more polycentric over time.
- Single-use office districts (as well as malls and industrial parks) convert to mixed-use areas with a mix of residential, office, and entertainment, deemphasizing the hub-and-spoke model of trip making.
- There is an overall decrease in business travel in favor of remote communications and meetings.
- More space is consumed at the urban periphery as workers tolerate fewer, longer commutes.
- Companies create multi-hub office constellations with peripheral neighborhood locations closer to where people live.

Future of Retail & Logistics

Key Finding: COVID-19 accelerated already shifting trends in retail and goods movement. The uptake of e-commerce is projected to significantly impact traditional retail and freight over next decade.

1 Rising E-Commerce

E-commerce has skyrocketed during the pandemic, with more shoppers than ever before buying items online and planning to continue doing so for the foreseeable future, precipitating a severe decline in brick-and-mortar retail.

2 Big Box to Distribution Hub

The decline of brick and mortar retail and simultaneous rise of e-commerce prompted conversions of big box and retail stores into logistics and distribution centers, with other potential future uses including multi-family housing, experiential retail, and food markets.

3 Experience Diversification

“Normal” in-person retail shopping is not expected to fully resume until at least 2023, if at all, and will likely be driven by experiential retail and services rather than dry goods.



Urban Distribution

2020 saw exponential growth in e-commerce markets, rapidly accelerating the adoption of on-demand delivery for many households worldwide. This trend points to an increasing shift from traditional conception of trip generation (based on consumer trips generated by places) toward trip attraction, with greater need for consideration of delivery, storage, and logistics across urban areas. This phenomena has fueled growth in distribution center construction, especially in dense urban areas, while depressing the growth of traditional brick and mortar retail. Over time, large-scale distribution centers may combine multiple functions, including automated vehicle fleet storage, electric vehicle charging, environmental services, and package storage and distribution.

OUTLOOK

Potential Outcomes

- Rising e-commerce continues to increase demand for localized, on-demand delivery.
- Increasing diversification of retail assets and experiences, with a focus on entertainment, mixed-use, food and beverage drives a surge in late-night rides and weekend travel.
- The conversion of outmoded retail assets to new uses, including mixed-use communities and logistics and distribution centers, creates additional destinations in areas inaccessible to transit, creating new ridership patterns, but also surfacing latent inequities.
- There is an overall decline in roadway and parking demand near major retail destinations as on-demand delivery commands a greater share of the market.
- Trip generation rates are revised to focus on trips received (direct to consumer) rather than trips generated.

Regional Development

Key Finding: American suburbs are growing. The pandemic accelerated this growth in some regions, as residents of densely populated and expensive cities fled to nearby suburbs. As work and commuting patterns shift, Millennials age, and more municipalities adopt 15-minute city paradigms, the landscape of cities and regions will emphasize mixed-use environments in both suburbs and the urban core.

1 Post-COVID suburban growth

COVID has driven an exodus to the suburbs from dense cities, but urban residential markets are keeping pace in many regions.

2 Suburbs are diversifying

As American suburbs grow, their demographics are becoming more ethnically, racially, and economically diverse.

3 Millennial homeownership

Increased demand for single-family homes is expected in the next decade, driven by Millennials entering home ownership.

4 Mobility-oriented development

As development opportunities shift away from places easily accessible from transit, developers have begun to expand their playbook of mobility management strategies.

OUTLOOK

Potential Outcomes

- The suburbanization of poverty results in an increase in transit-dependent populations without access to a car in the suburbs. Rideshare continues to fill gaps poorly served by transit.
- Growing millennial homeownership presents an opportunity to create models for car-free or car-light communities, catering to populations who are already Uber users.
- Developers experiment with car-free developments catering to new generations disinterested in the burdens of car ownership.
- An increasing number of people experience the city in a polycentric way, moving through and between outlying areas of the city, rather than moving back and forth between the core.
- More developers opt to pursue amenity and mobility packages instead of building parking for residents beyond the transit shed.



The 15-minute City

As more people started working from home, trips in many places became more localized, with a focus on running errands, and circulating throughout and between outlying neighborhoods. Highly localized trips suggest that when more people work remotely, their daily routines revolve more around their neighborhoods and adjacent business districts. These patterns could have long-range implications for how the Uber platform serves downtowns and traditional tourist destinations versus neighborhoods. Mixed-use districts proved far more resilient in retaining trips, demonstrating that single-use office, residential, or industrial areas may be less resilient areas for Uber uptake in the long-term.



Car-Free Suburbia

In the United States, 2020 saw explosive changes in the home-buying market, with many people leaving older cities and buying homes for the first time. Mirroring changes seen in past generations, millennials are increasingly suburbanizing, pointing to the persistence of patterns of land use that privilege car ownership at the expense of carsharing and transit ridership. At the same time, numerous experiments are now afoot to test car-free or car-light suburbs, which may be friendlier to Uber's Rides business and longer-term changes in autonomous fleet technology. High rates of car ownership and low-density land use patterns are anathema to Uber's long-term growth.

Uber's Role

Overview

Uber plays a critical role as a transportation provider and connector in cities globally, providing on-demand mobility, delivery, and affordable transit to millions of people.

Uber plays a critical role as a transportation provider and connector in cities globally, providing on-demand mobility, delivery, and affordable transit to millions of people, while also serving as a leader in software development, data analysis, and transportation technology. Beginning in 2012, Uber established rideshare as a critical part of the mobility ecosystem in cities and has since helped normalize integrated models of Mobility-as-a-Service for transit, carshare, bike share, and scooters, among other modes.

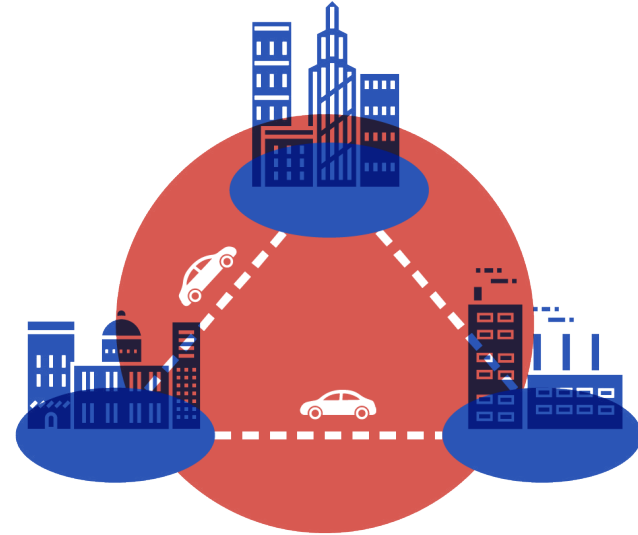
While Uber's success as a ridesharing company has been well documented, the reality behind that success reveals deeper challenges and inequities that remain beyond Uber's capacity to address. Approximately 84% of individuals in the United States travel to work by private car. Of households without access to a private car, 80% point to financial constraints as the reason why and rely on often inadequate or infrequent bus service to get to work and run errands. Infrastructure investments and land use regulations in many places reinforce this pattern, propagating car-owning households, and their associated negative externalities, often without

viable alternatives. While this trend has been most prominent in the United States, many emerging economies are following the same trajectory. In many geographies, access to transit is physically impossible due to poor roadway conditions and gaps in sidewalk networks, making walking a serious safety risk for those who need to access transit or travel without a private vehicle.

At a basic level, Uber has been extremely successful as a mobility provider for two reasons. First, it has created real transparency and efficiency in shared, on-demand transportation services- revealing the locations of drivers, routes, and timing while offering indicative, real-time pricing estimates. For an emerging tech-enabled generation, Uber provided a clear and easily accessible source of information that reduced the fundamental uncertainty and unreliability of bus and taxi service. Second, Uber offers people across the income spectrum an alternative or "insurance policy" when access to a car or to transit is out of reach, even if those riders have no viable alternative aside from Uber. Historically, traditional taxi and car services played this same role, but in major markets, their lack of rider-driver matching capabilities, over-regulation and poor price transparency largely devalued the industry and gave rideshare a clear competitive advantage, even where prices are comparable. While Uber was initially introduced as a luxury black car service, as its use has become more universal, it has become increasingly favored by younger populations and those without access to a car.

Beyond its role as a functional transportation provider, Uber plays an important role as a market shaper. Uber has strategically expanded into new markets, including freight, delivery, automation, car

Scales of Influence



The Region

Uber operates across and at times between regions. In contrast to traditional transit or taxi networks, Uber's operations reflect regional economic demand and are often subject to different jurisdictional boundaries than taxi and transit.

The Network

Street networks and land use patterns drive the geography of Uber usage in critical ways. Geographies of Uber usage provide a critical view of how and where an urban economy operates at the land use-transportation nexus.



The Street

For riders and drivers, the experience of using Uber starts at the street and on the curb. Curbside management and pick-up/drop-off are critical to how Uber happens in real time and how it can partner with cities.



rental, transit, and micromobility, among others. These advances have not all been successful, but have broadly reshaped the field by moving providers towards a mobility-as-a-service model, creating new markets and fueling competition with OEMs, rideshare competitors, and micromobility providers.

Nevertheless, despite its potent market influence and leadership in transportation technology, Uber remains far from its goal of becoming the "Amazon of transportation." Why? The answer is both complex and simple. While Uber has been a leader in shaping the rideshare market and garnering market share from taxis, car rentals, and public transit, it has only fractionally begun to have an impact on its largest competitor- the private car.

Private car usage, especially in the United States and increasingly in the developing world, remains extremely high. In the US alone, there are approximately 1.2 cars for every licensed driver. In order to make a real breakthrough in the market, Uber would need to have far more influence in two arenas - car ownership and land use. These two areas are fundamentally intertwined, and are themselves intricately woven into a number of other policy drivers, such as school quality, property tax structures, labor, and crime. While some people envision a future in which self-driving vehicle fleets have changed the basic nature of ownership and its relationship to housing and land use, these kinds of changes would require immense, sustained private investments and federal intervention at a scale unseen since the post-World War II era, and even then might not be sufficient to shift fundamental patterns of car ownership and land use.

By 2030, transportation will be a \$7 trillion dollar industry, of which the rideshare and micromobility markets will comprise only 5%. While the rideshare industry has witnessed over \$120 billion in venture capital investment over the last 10 years, it remains

a small piece of the entire industry with an outside voice and reputation. From a cost perspective, the cost of private vehicle ownership is still far less on a cost per mile basis (\$0.74 vs. \$2.00) than ridesharing. Additionally, due to the lifespan of a car, once a consumer decides to purchase a vehicle, replacement with alternative modes, especially in the absence of burdensome vehicle and gas taxes or parking constraints, presents a major hurdle.

According to Goldman Sachs' Future of Mobility Report (2019), "to ultimately revolutionize the way consumers move from point A to point B...ridesharing companies will need to transform their core product into a utility from a luxury good." As a result of increased competition and rising prices, adoption of Uber's Rides business has gradually declined, with lower growth and higher profitability. By making rides more affordable, Uber could drive adoption and help ensure longer-term profitability. This assumes that Uber would be able to attract a sufficient number of drivers to drive supply, which may be challenging due to the large number of drivers who left the platform during the pandemic.

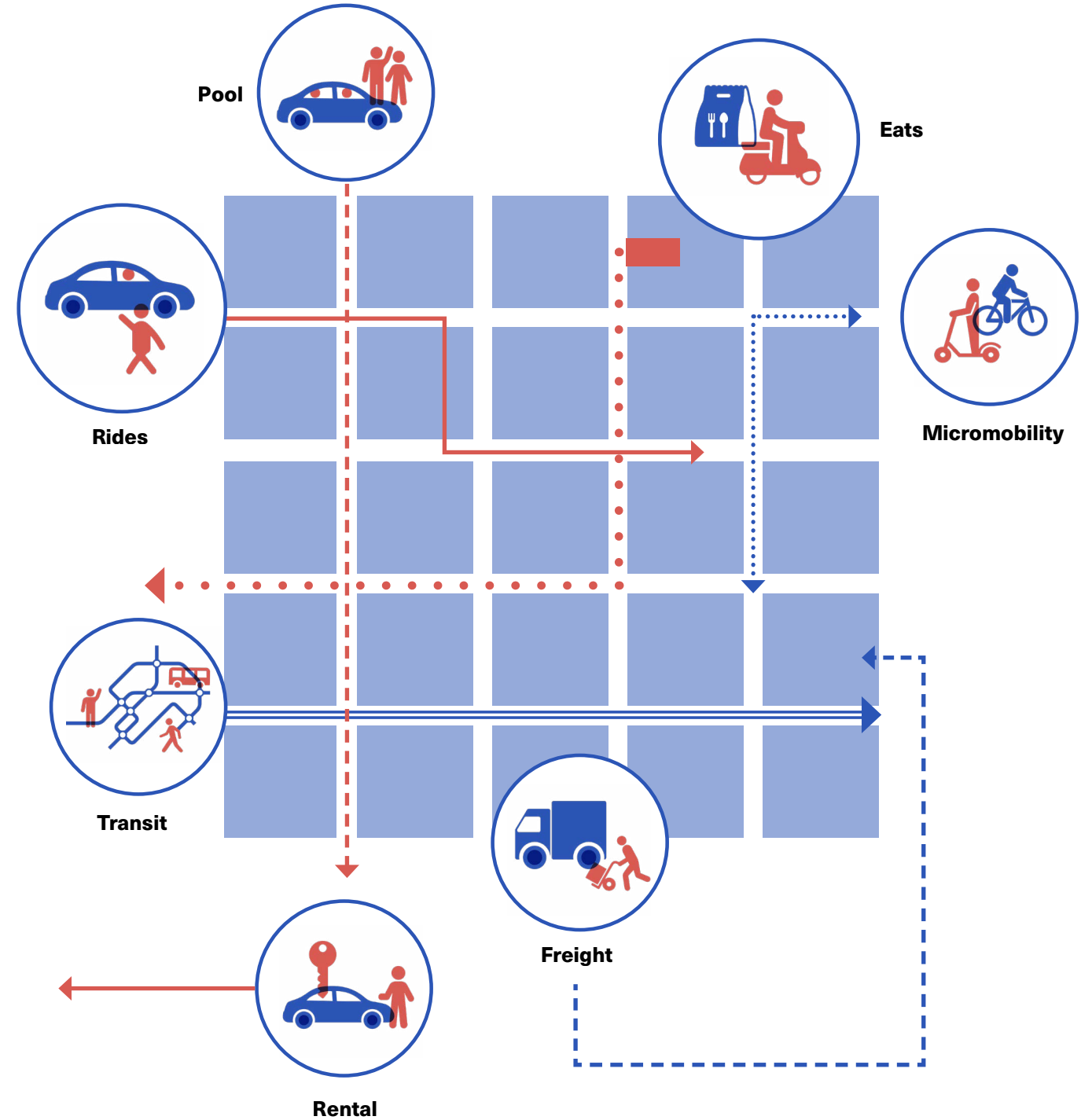
From a policymaker perspective, decreasing the cost of rides, absent any other changes in Uber's business, could have adverse near-term consequences for the recovery of transit and taxi service, but could herald valuable opportunities for partnership to better meet the needs of lower-income populations who are already using Uber at a higher price point to make up for poor transit service. Lower cost rides could also create a negative experience for drivers on the platform, resulting in lower overall earnings and constrained supply. In tandem, Uber has an opportunity to further integrate its micromobility services, including Lime, into its platform, to take advantage of more localized trips being made by remote workers, capitalize on rising e-bike and scooter usage, and offer an environmentally friendly alternative to the car.

Uber's business operates across multiple types of rides and users. Beyond its core Rides business, Uber connects people and goods, creates opportunities for riders and drivers to rent cars, and offers multiple shared transportation solutions, including UberPool and Lime, through its application. Across these different services and platforms, Uber users adopt the platform for a variety of reasons, including tourism, business travel, events, and to a lesser degree, as a way of getting to work or school.

During the pandemic, Uber usage skewed from its core services towards Eats and more essential rides and commutes, a ride type that had previously been far less frequent among its users.

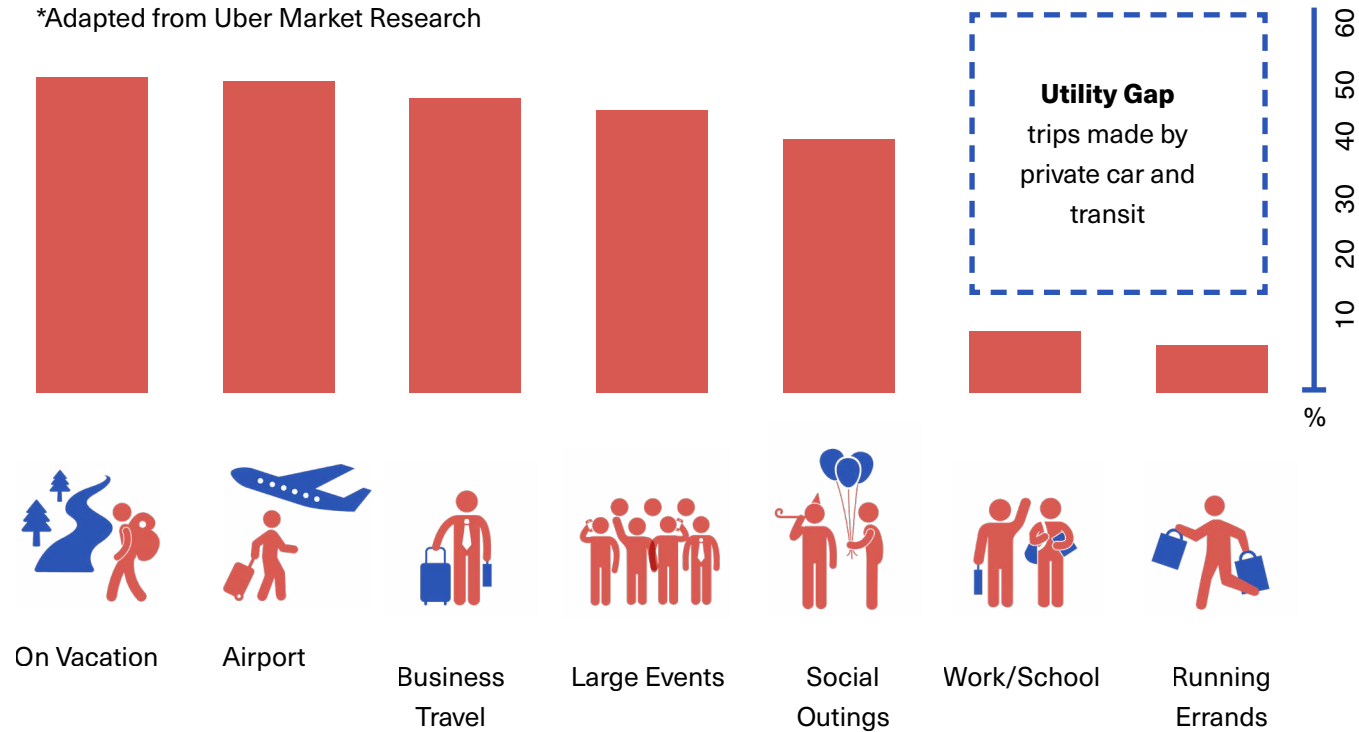
Given the strong association of Uber with travel, business, and leisure/outings, how can Uber become more of a utility and less of a luxury? At an aspirational level, Uber should strive to offer a cost competitive and convenient service for every trip type that someone would make by private vehicle, including commuting and running errands. Uber's goal should not be to fulfill every single journey a person makes with Uber, but instead to have an affordable service that is competitive in terms of time and cost with both leisure and routine trips. To achieve this goal, Uber will need to foster and expand its transit, Pool, and micromobility offerings, while experimenting with new bundles to drive adoption.

Uber's Mobility Matrix



Percent of Riders who use Uber for each occasion

*Adapted from Uber Market Research



New Bundles

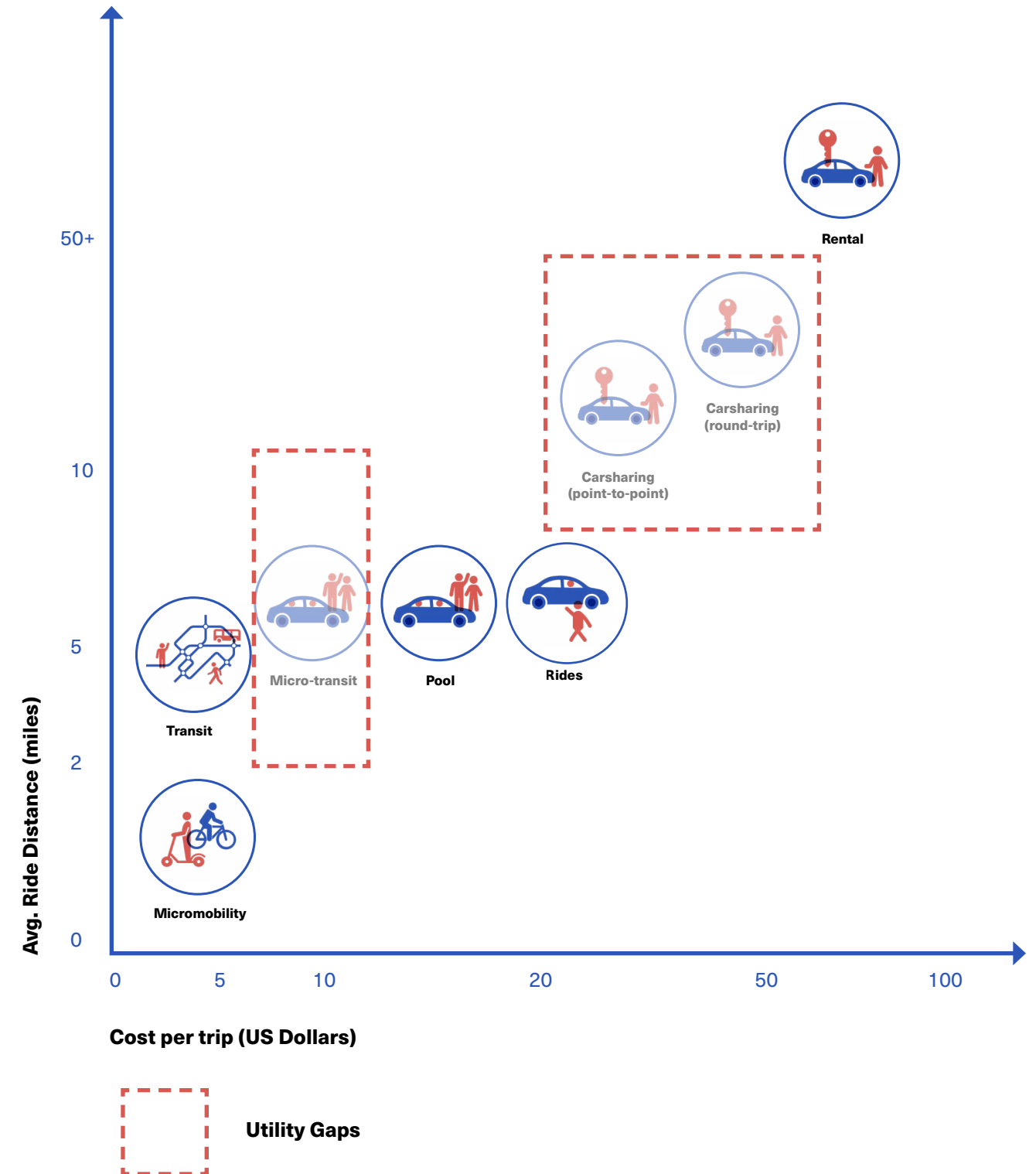
As Uber's business has evolved, so too have its offerings and packages geared towards customer retention and loyalty. Across multiple markets, Uber has offered UberPass, a service that offers users discounted rides, Eats, and other perks for \$25 per month (differs by market). Uber for Business caters to companies whose employees frequently use Uber for work and other business travel. For higher income individuals and business travelers, these services have attained some level of success, but they ignore a large segment of Uber riders, namely younger, mid-20s individuals and lower income riders, who are more likely to use UberPool and to combine Uber with transit and micromobility offerings. For many of these users, integrated and seamless payment, transfers, and other services that could be bundled under a comprehensive MaaS scheme do not exist, except in places where Uber has existing transit partnerships.

Strategic partnerships are key to Uber's future success and will enable it to fill gaps in its current services that can meet multiple points of demand in terms of price and distance. While Uber has strong partnerships with micromobility services (Lime) and some transit agencies, it lacks a microtransit option and does not offer point-to-point or round-trip carsharing service (ZipCar, ShareNow, etc), which can support multi-hour trips within cities or longer excursions just outside cities (Uber's hourly option permits this use in theory, but is far more expensive than Zipcar). While Uber previously established a partnership with Getaround (a partnership still in place for drivers), providing a competitive fleet-based carsharing service could help close the gap between traditional car ownership and shared rides. The economics of many of these gaps remain

tenuous and many entrants, including Chariot and to some extent Via have struggled to make competitive microtransit work financially. Point-to-point carsharing has similarly been plagued by missteps and financial woes, with both Car2Go (now ShareNow) pulling out of the US market several years ago. New moped services and e-bikes have begun to fill the gap left by these services, but their offering is not equivalent.

One potential option would be to work more closely with car rental companies, who already often furnish Uber drivers with vehicles, to experiment with more dynamic carsharing options that can approximate the convenience and accessibility of Zipcar and ShareNow. Stronger partnerships between Uber and car rental services (traditional and shared ownership) can help bridge these gaps in the market and provide people with more readily accessible alternatives to car ownership.

More targeted mobility bundles based on specific demographic segments could also help drive demand among specific sub-markets who are partially dependent on Uber as a utility. This includes younger and elderly populations who may have very specific Uber use patterns and low-income populations who may be relying on Uber as a transit supplement.



Recommendations

Changing fundamental dynamics in urban (and suburban) transportation markets will require a high degree of experimentation, with increasing focus on a diversity of scales and markets in the US and internationally.

The following recommendations capture some of the strategies, policies, and approaches that Uber could embrace to further its adoption and diversify its services. These actions are potential ideas for Uber to build towards a post-COVID future that understands and anticipates how cities may evolve over the next decade.

1. Fill the Utility Gap

The pandemic illustrated how Uber's services are utilized by a wide range of demographics for both leisure trips and essential rides. Relatively high ridership among lower-income demographics points to the need to more fully explore how this segment of the market uses Uber today and how to ensure that the right partnerships are in place to serve a wide variety of trip types. Better understanding how Uber can better fulfill routine trips, such as running errands and commuting, can help frame how Uber integrates with transit and car ownership. Strategic partnerships with microtransit and carsharing providers can help fill those gaps, while ensuring that Uber is capturing the widest possible segment of the shared mobility market.

Action Items:

- Add real-time bus and subway location information to the app, even where partnerships are not in place.
- Create strategic partnerships with microtransit and carsharing providers, as well as car rental companies, to create an affordable bridge between rideshare and car ownership.
- Develop targeted mobility bundles that fulfill the needs and travel patterns of captive users and lower income riders in tandem with existing transit partnerships.
- Develop Uber "excursion" packages catered to non-car owning households to access outlying parks, beaches, and open spaces.
- Explore feasibility of creating an all-electric carsharing fleet with strategic development and off-street parking partnerships to support the expansion of electric vehicle access.

2. Neighborhood Mobility Hubs

Uber is well situated to serve the polycentric model of urbanization that has emerged over the past several decades. At the same time, as new mobility services have become more prevalent, aligning them within both physical spaces and digital spaces has become a policy and operational challenge. Pressure to shift to more electric powered vehicles, moreover, has not created a readily available supply of green energy.

Uber can expand its urban footprint by pursuing the creation of a series of mobility hubs as the gas stations of the future. These hubs could co-locate EV charging infrastructure, transit, car rental, car share, electric bike sharing, and scooters, while offering easy conveniences and services to drivers for Rides and Eats. Ancillary services, such as distribution and package fulfillment, could also take advantage of these locations.

Uber could begin by developing a series of hubs in strategic locations globally as a test and then expand them through partnerships and co-branding with convenience stores and other entities.

Action Items:

- Create 5-6 global test mobility hubs that bring multiple services together, including EV charging, car rental, car share, transit, and e-bikes.
- Explore partnerships with convenience or drug stores where Uber can co-locate mobility hub services.



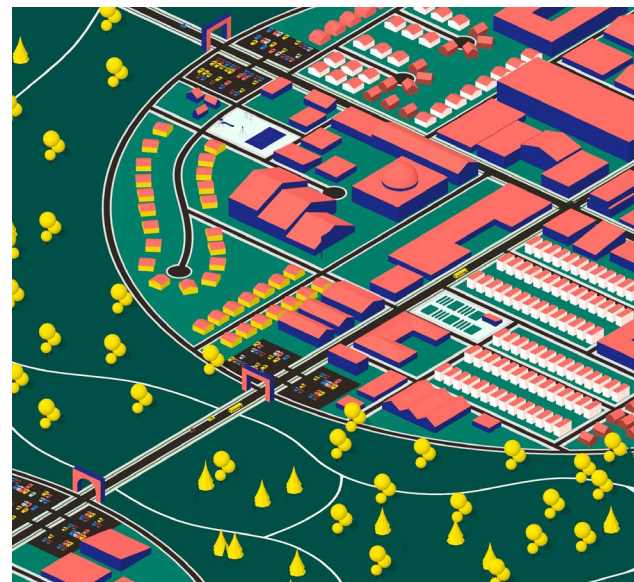
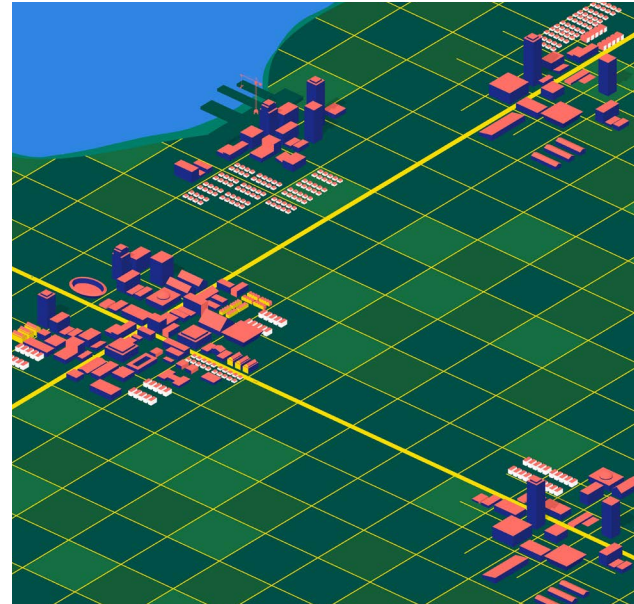
3. Mobility-oriented Development

Despite the intrinsic relationship between development and transportation, very few tech companies have aggressively tried to shift the development paradigm through partnerships and new technologies. Innovation has occurred in information technology (Transit Screen), partnerships with parking providers, and through a number of experiments in mobility subscriptions or amenity packages, but never at scale.

At the same time, new experiments in car-free urban living are underway, signaling that developers and regulatory agencies may be open up to more drastic solutions to decrease carbon emissions and limit car ownership. Other experiments, like San Francisco's Park Merced development, have tried to shift the paradigm by providing mobility packages and subscriptions in lieu of required parking.

Action Items:

- Catalyze developer relationships and partnerships that foster car-free or car-light development alternatives which rely on a combination of transit, rideshare, micromobility, and carsharing.
- Explore strategic partnerships with developers to offer mobility packages to residents in place of parking as an initial experiment and use these experiments to inform future market demand for car ownership-free options.



4. Congested Curbs Dashboard

Especially during COVID, curbside management has become a pressing concern for cities. Whereas many cities once defaulted to providing on-street parking, citizens and advocates are now viewing curbs as a multifunctional space for outdoor dining and recreation, bike and scooter parking, loading zones, and a host of other civic amenities. Uber relies on access to the curb for its Rides business and as a result, its drivers and back-end data provide valuable insights on curbside congestion and management. Many cities are working to try to implement new curbside management techniques, including the use of image-recognition technology to map and manage curbs.

Uber can be a strategic partner to cities in providing curbside management insights. A curbside congestion dashboard could help cities better understand where Uber drivers are seeing challenging conditions, such as double-parking and overcrowding at the curb, and present an opportunity for collaborative decisionmaking on where pick-ups and drop-offs can happen most efficiently, reducing congestion and making the PUDO experience more efficient. Uber already coordinates closely with municipalities for airports and large events, so moving into more granular curbside management strategies is a natural next step and a logical place to develop smart partnerships with cities.

Action Items:

- Develop a Curbside Congestion Dashboard and work with 3 cities to implement and test the tool.

5. MaaS Trip Planning & Payment Integration

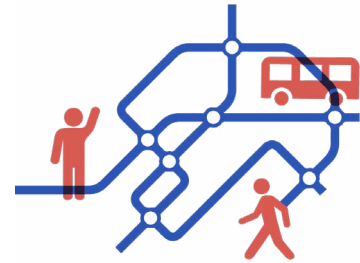
Uber has historically played a leadership role in payment for mobility services, pioneering the use of dynamic pricing across its apps. Its own services, along with those of Lime and multiple transit agencies, are integrated into its app. Uber, however, has not brought other competing services onto its app and does not compete with other transportation aggregators, such as the Transit App or CityMapper. As a result, while it offers limited mobility-as-a-service functions in its own app, it has yet to achieve the "app-for-everything" status that MaaS aspires to.

At the same time, many trip planning applications have become trusted partners of transit agencies and successfully provided consumers with a range of mobility options to choose from. By acquiring a trip planning application, Uber could gain valuable insights into individual consumer trip-making decision patterns, while developing a pathway to eventually creating an all-in-one payment solution for its app. Hosting multiple providers (including direct Rides competitors) on its apps could have negative impacts on Uber's competitiveness, but could also reposition the business as a more integrated solution that offers a wider variety of options and services

Action Items:

- Explore potential acquisition of Trip Planning Application (TransitApp, Moovit, CityMapper).

Timeline



1 Transit Transparency
Add real-time bus and subway location information to the app, even where partnerships are not in place.

4 Car Share Partnerships
Create strategic partnerships with microtransit and carsharing providers, as well as car rental companies, to create an affordable bridge between rideshare and car ownership.

5 Congested Curbs Dashboard
Develop a Curbside Congestion Dashboard and work with 3 cities to implement and test the tool

6 Mobility Amenity Packages
Explore strategic partnerships with developers to offer mobility packages to residents in place of parking as an initial experiment and use these experiments to inform future market demand for car ownership-free options.

7 Car-free Developer Partners
Catalyze developer relationships and partnerships that foster car-free or car-lite development alternatives which rely on a combination of transit, rideshare, micromobility, and carsharing.

10 Global Test Mobility Hubs
Create 5-6 global test mobility hubs that bring multiple services together, including EV charging, car rental, car share, transit, and e-bikes.

9 Acquire Trip Planning App
Explore potential acquisition of Trip Planning Application (TransitApp, Moovit, CityMapper).



2 New Mobility Bundles
Develop targeted mobility bundles that fulfill the needs and travel patterns of captive users and lower income riders in tandem with existing transit partnerships.

8 Mobility Hub Partners
Explore partnerships with convenience or drug stores where Uber can co-locate mobility hub services.



3 Uber Excursions
Develop Uber "excursion" packages catered to non-car owning households to access outlying parks, beaches, and open spaces.



11 Electric Carsharing
Explore feasibility of creating an all-electric carsharing fleet with strategic development and off-street parking partnerships to support the expansion of electric vehicle access.

Mobility Networks

Case
Studies

Methods & Key Findings

As COVID-19 disrupted the daily routine and rhythm of cities globally, it also provided a natural experiment for researchers to better understand how transportation patterns might shift under far different living and working conditions. This white paper looked at Uber data from eight cities globally to assess how people used Uber at multiple points during the pandemic. The goal of this research was to better understand how COVID-19 and its aftermath may impact the future of cities, and in turn, how it may impact Uber's core business.

This analysis reviewed Uber ridership data in five periods between April 2019 and March 2021. Data was aggregated for a month-long period for April 2019, April 2020, September 2020, December 2020, and March 2021. Data analysis focused on eight case study cities, which were chosen in collaboration with Uber and were intended to reflect multiple city typologies and geographies where Uber operates across the globe. The case study cities selected were broken down into the following typologies:

- **Large, transit-rich, high-density cities:** New York City, London, Hong Kong
- **Large, transit-poor, high-density cities:** Sao Paulo, Johannesburg
- **Large, transit-poor, low-density city:** Phoenix (AZ)
- **Medium-sized, transit-poor, medium-density city:** Cincinnati (OH)
- **Small, transit-poor, low-density city:** Waco (TX)

A mobility profile was compiled for each city, including overall transit usage and car ownership. The team also looked at the response of each city

to COVID in relation to that city's overall case load. Multiple maps were generated for each geography, including maps showing land use, transit (with 0.5 mile buffers), and median household income.

Using data from Uber, trips were aggregated and analyzed at a census tract level (or equivalent), with origin-destination trip pairs of 5 trips or less (per month) screened out for privacy purposes (overall trips were collected at the city level for each month). For each city, the team assessed the following questions.

Trip Geography & Distribution: How did the overall distribution of trips change during the pandemic? Did any geographies see an absolute increase in trips? Did any geographies see relatively less of a decrease in trips? Did trips to traditional destinations (downtowns, shopping districts, entertainment areas) recover?

Trip Time Distribution: Did Uber usage patterns change by time of day? Did certain periods of the day see more or fewer trips?

Trip Length and Distance: Did Uber riders take longer or shorter trips during the pandemic? Were trips more localized or more long distance?

Income-related travel patterns: What was the relationship between Uber ridership and income (based on geography) during the pandemic? Did clear patterns emerge in terms of either origins or destinations?

Based on these individual patterns, the team looked at land use, transit usage, and income to

assess potential causes of observed trends and outliers in the data. Past research has shown that determinants of Uber usage are complex, but are generally influenced by a combination of factors, including access to a car, transit ridership, and built environment characteristics.

At the conclusion of the study, the team synthesized a set of eight key takeaways from the data, which have been synthesized into four key findings in the Executive Summary.

1. Essential worker travel

In most of the cities analyzed, lower-income census tracts (or equivalent) saw a relatively lower decrease in overall rides, indicating that lower-income individuals likely continued to travel more often and used Uber proportionally more than before the pandemic.

2. Essential worker destinations

Major essential employment destinations, including hospitals, fulfillment centers, industrial zones, and big-box stores like Walmart and Target, saw lesser decreases (or absolute increases) in trip volume. These patterns reinforce how Uber played a critical role as a transportation provider during the pandemic, but also suggests that the new geography of commerce lacks transit-accessibility.

3. Uber and transit lag behind vehicle miles traveled

By late 2020, VMT recovered above normal levels, indicating that more people were driving than taking transit and shared mobility. Uber's recovery pattern closely follows that of transit in most markets, rather

than tracking with VMT and private vehicles.

4. CBD recovery is lagging

As Uber trips have recovered, their recovery has lagged behind in traditional central business districts, especially in those dominated by and reliant upon office workers. Some geographies exhibit a "donut hole" characteristic, with peripheral travel increasing, but avoiding the central city.

5. Open space excursions

Many riders used Uber during the pandemic to access open spaces in the core and at the periphery of cities. Uber provided an important link to natural resources during lockdown, including major parks, beaches, and hiking areas.

6. Trip distances saw limited fluctuations

In contrast to what was initially expected, in most geographies, average trip distances changed relatively little. In a few places, trip distances increased marginally at the start of the pandemic, but later returned to normal levels.

7. Trip time distribution

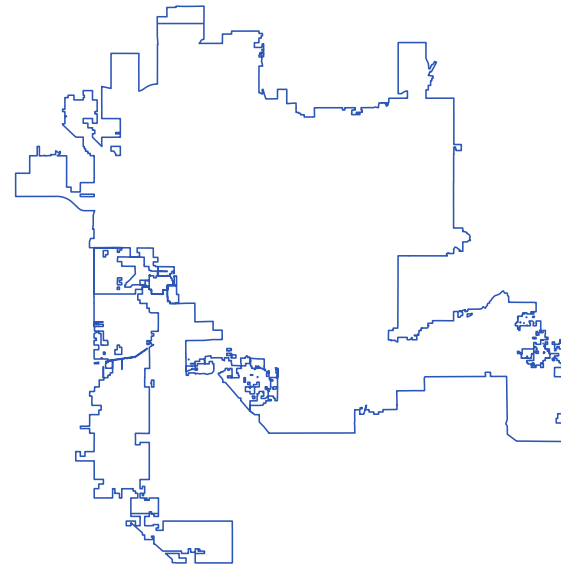
In contrast to what was expected, trip time distribution changed marginally, with an initial drop in weekend and weekday night trips, followed by a return to relatively normal trip distribution patterns.

8. Car ownership rates drove Uber usage

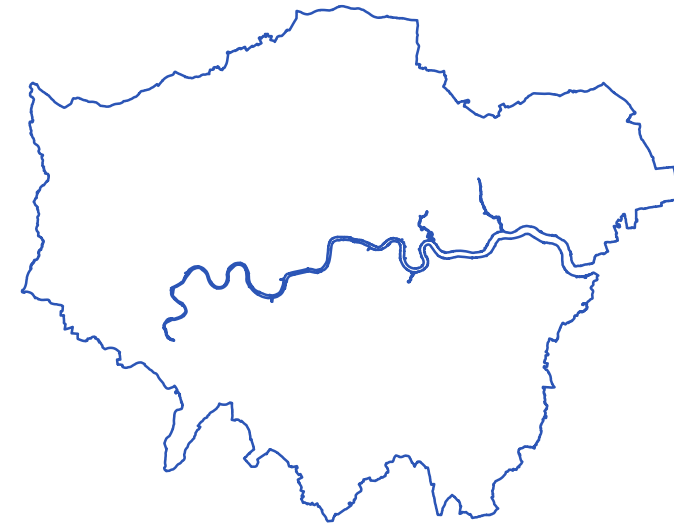
Both before and during the pandemic, lower rates of car ownership were strongly associated with Uber usage. These trends were exacerbated during the pandemic, as public health concerns around social distancing mounted.



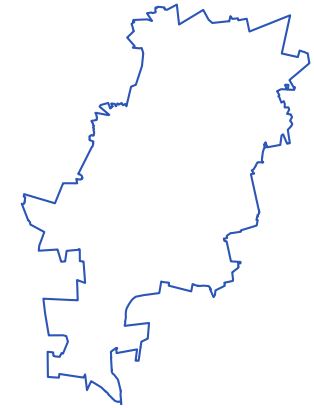
New York City



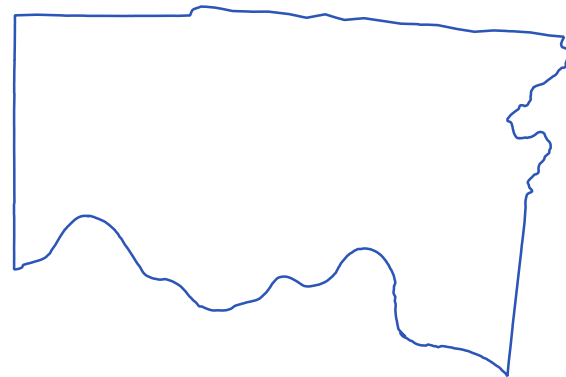
Phoenix



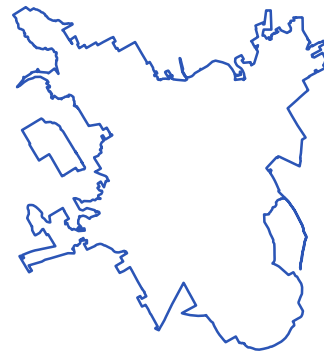
London



Johannesburg



Cincinnati



Waco



Sao Paulo

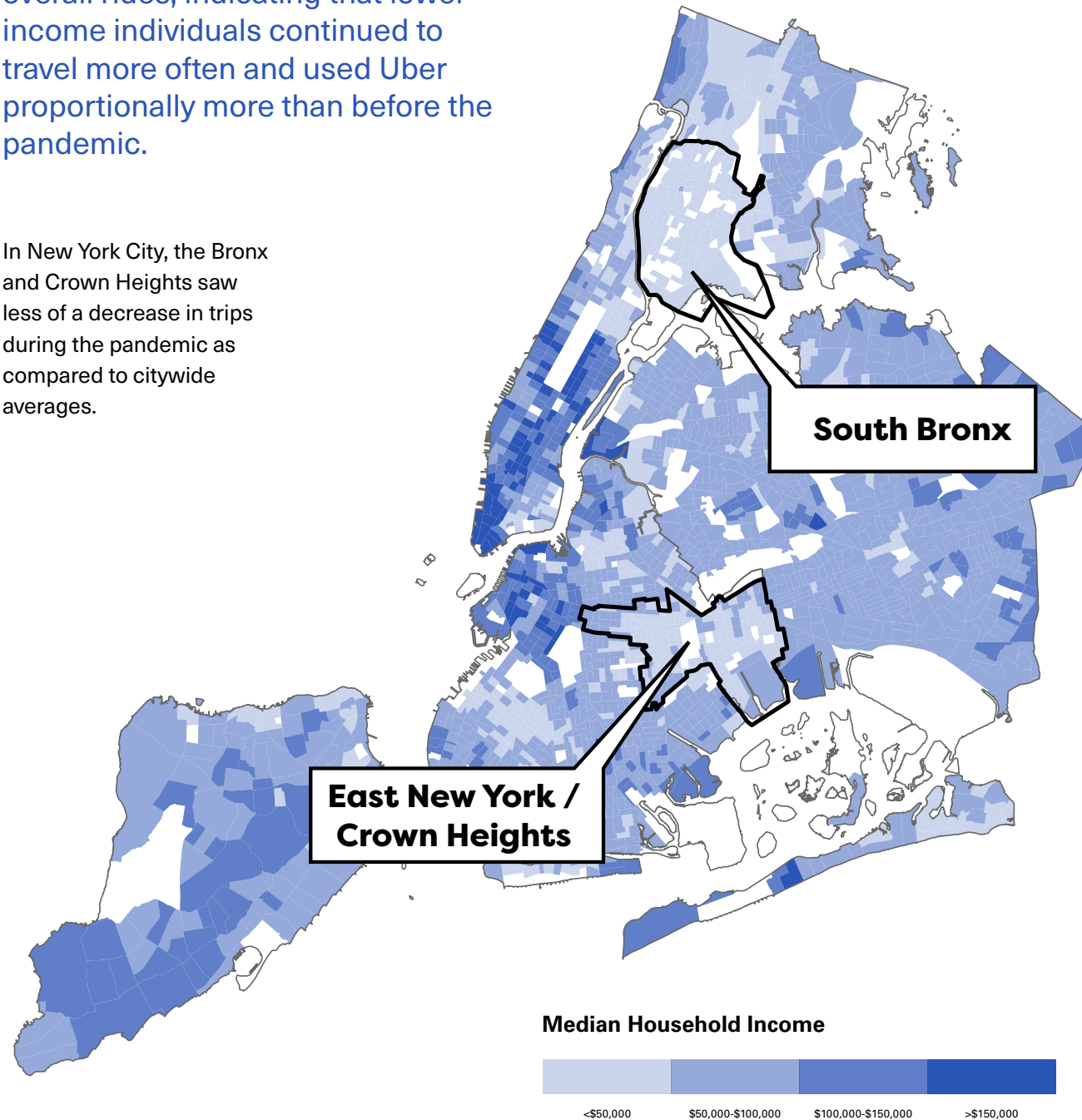


Hong Kong

1 Essential Worker Travel

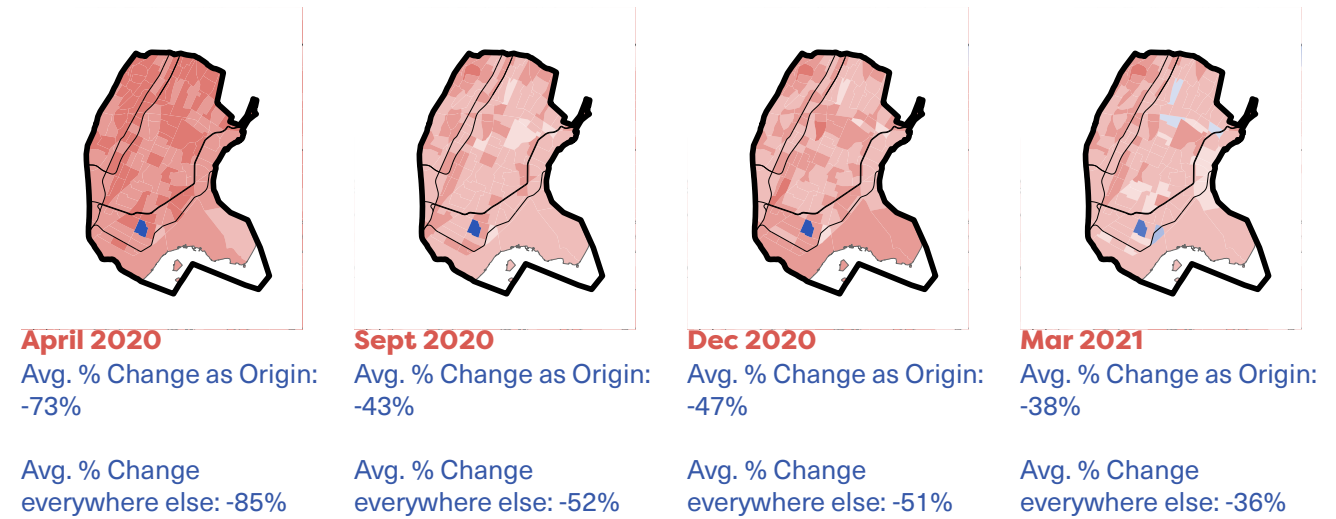
In most of the cities analyzed, lower-income census tracts (or equivalent) saw a relatively lower decrease in overall rides, indicating that lower-income individuals continued to travel more often and used Uber proportionally more than before the pandemic.

In New York City, the Bronx and Crown Heights saw less of a decrease in trips during the pandemic as compared to citywide averages.

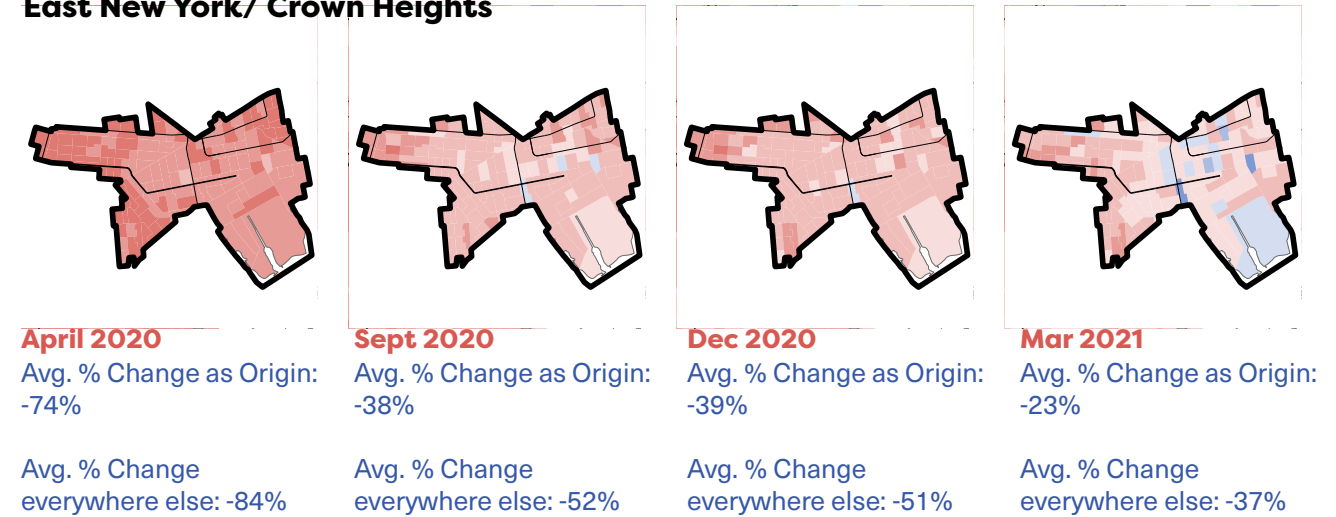


Below: Changes in trip volumes for lower-income New York City neighborhoods vs. citywide averages, indexed to April 2019.

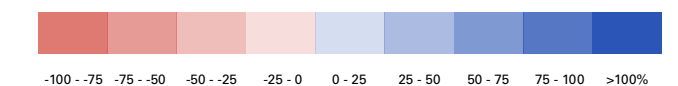
South Bronx



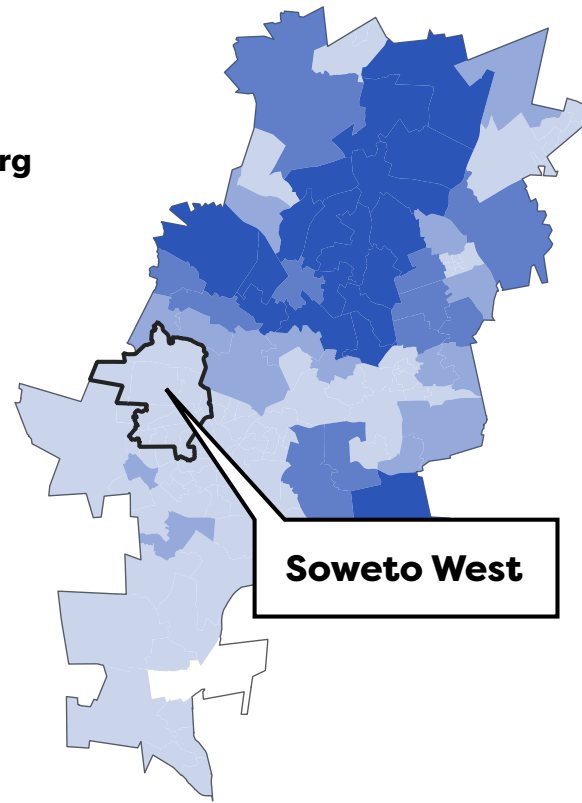
East New York/ Crown Heights



% Change in Trip Volume (compared to April '19)



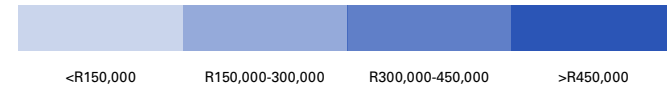
Johannesburg



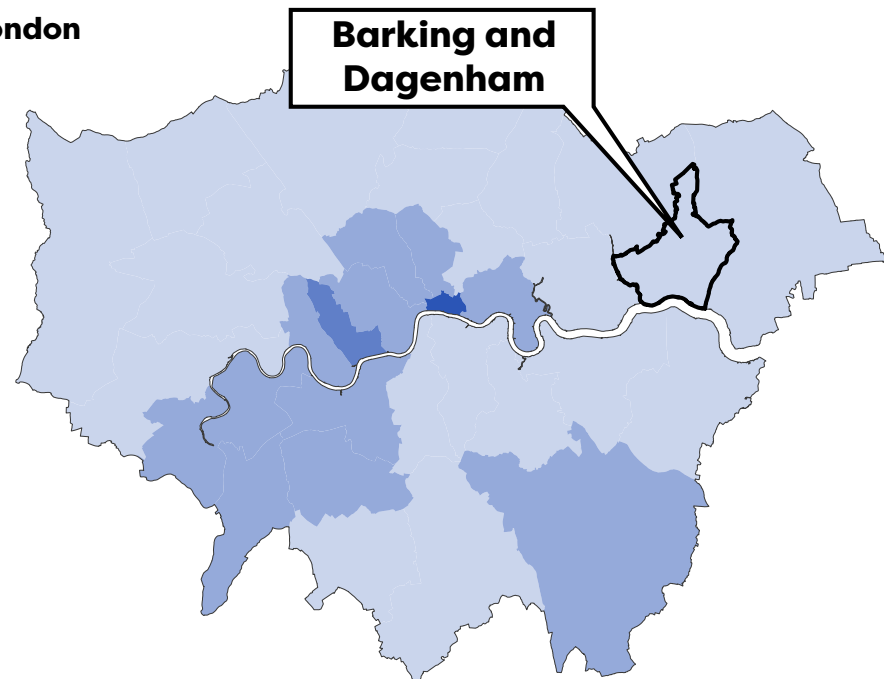
Soweto West

A lower-income census tract, Soweto West saw significant ridership growth during the pandemic as transit service faltered and essential workers needed access to rides.

Median Household Income



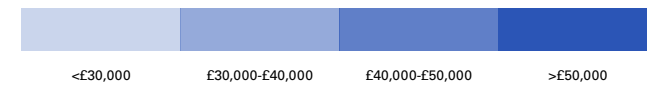
London



Barking and Dagenham

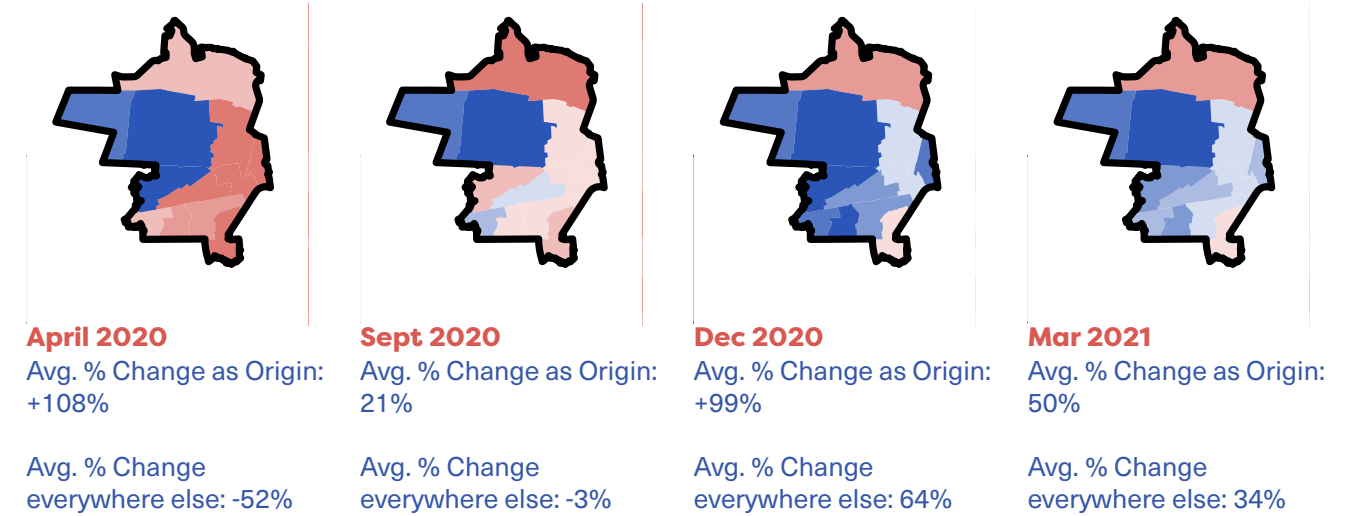
The percentage decrease in many poorer, outlying areas of London was far less than declines seen in wealthier core areas of the City.

Median Household Income

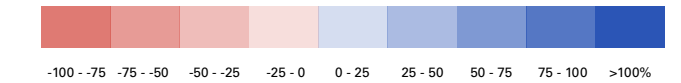


Below: Changes in trip volumes for lower-income Johannesburg and London neighborhoods vs. citywide averages, indexed to April 2019.

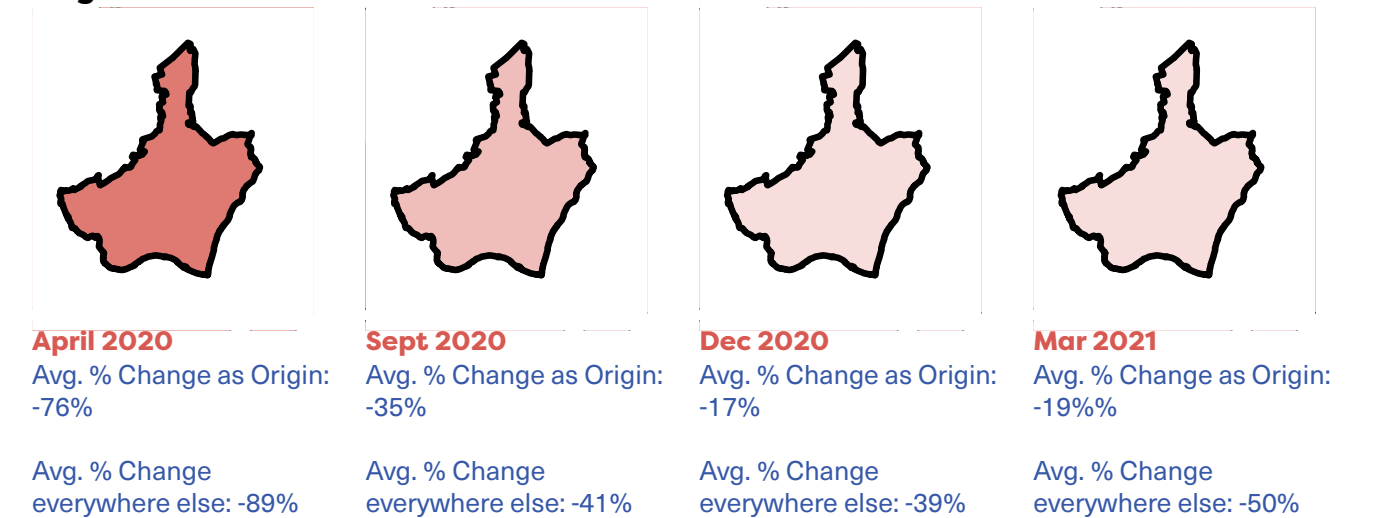
Soweto West



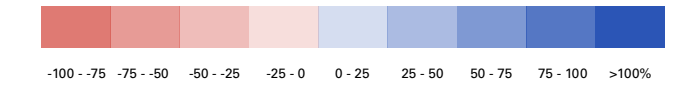
% Change in Trip Volume (compared to April '19)



Barking and Dagenham

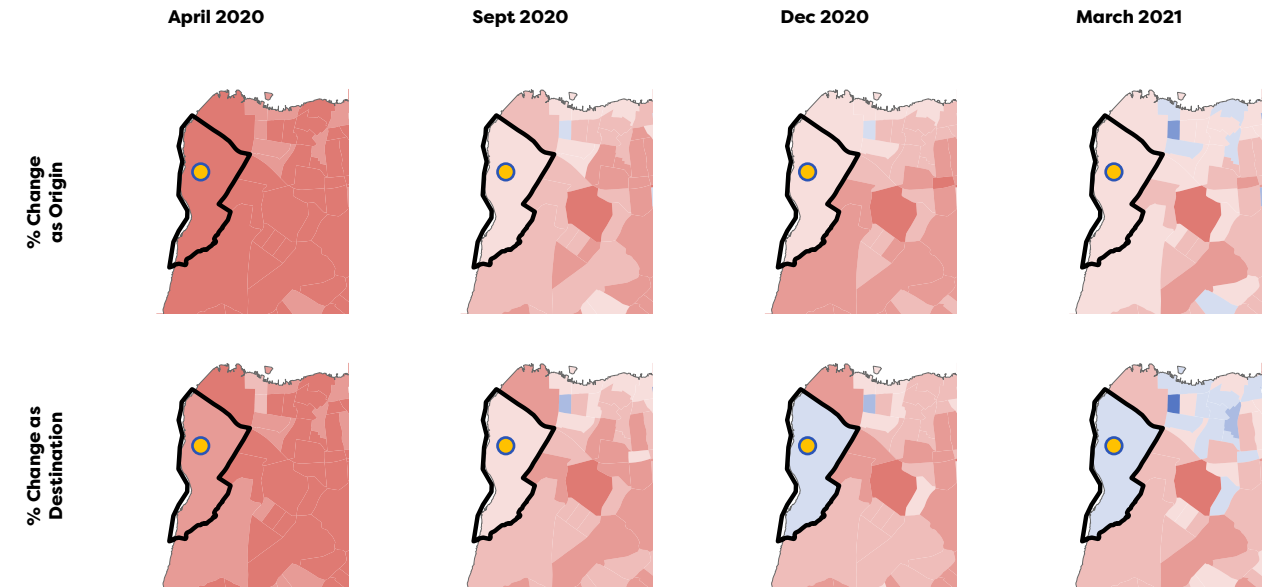
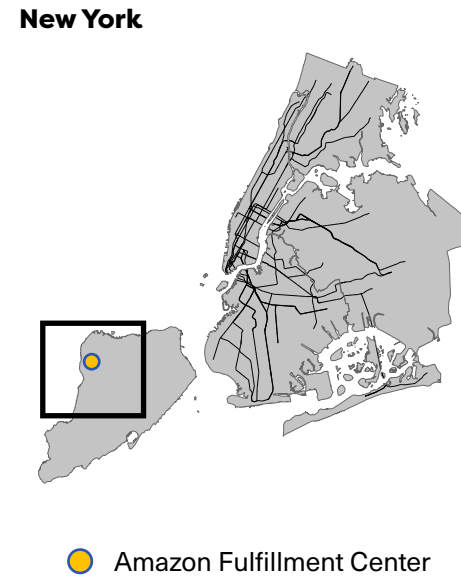


% Change in Trip Volume (compared to April '19)

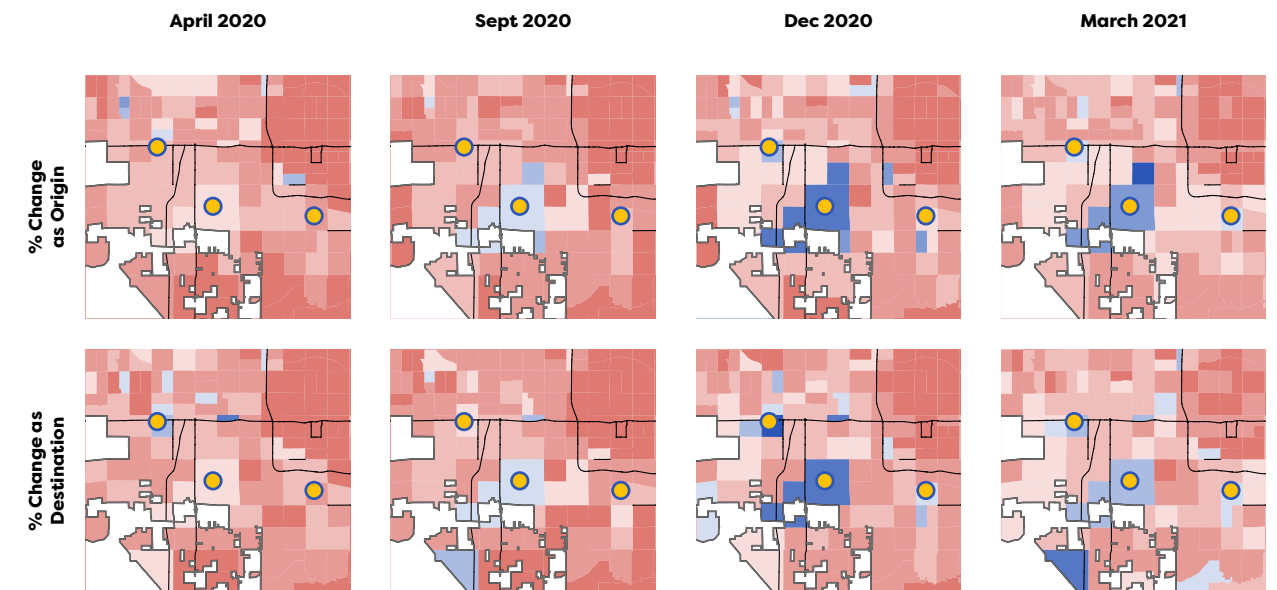
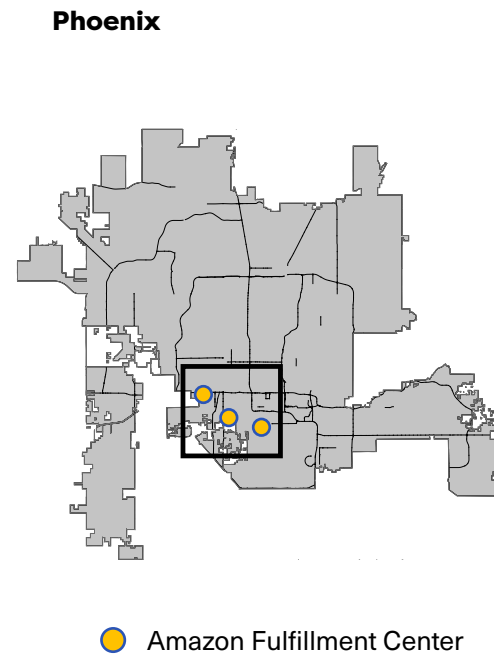


2 Essential Worker Destinations

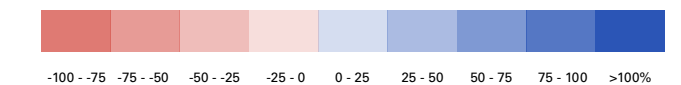
Major essential employment destinations, including hospitals, fulfillment centers, industrial zones, and big-box stores like Walmart and Target, saw lesser decreases (and some absolute increases) in trip volume. These patterns reinforce how Uber played a critical role as a transportation provider during the pandemic, but also suggests that the new geography of commerce lacks transit accessibility.



In both New York and Phoenix, large Amazon fulfillment centers saw significantly less of a decrease in trips and in some cases, witnessed an absolute increase in trips from April 2019.

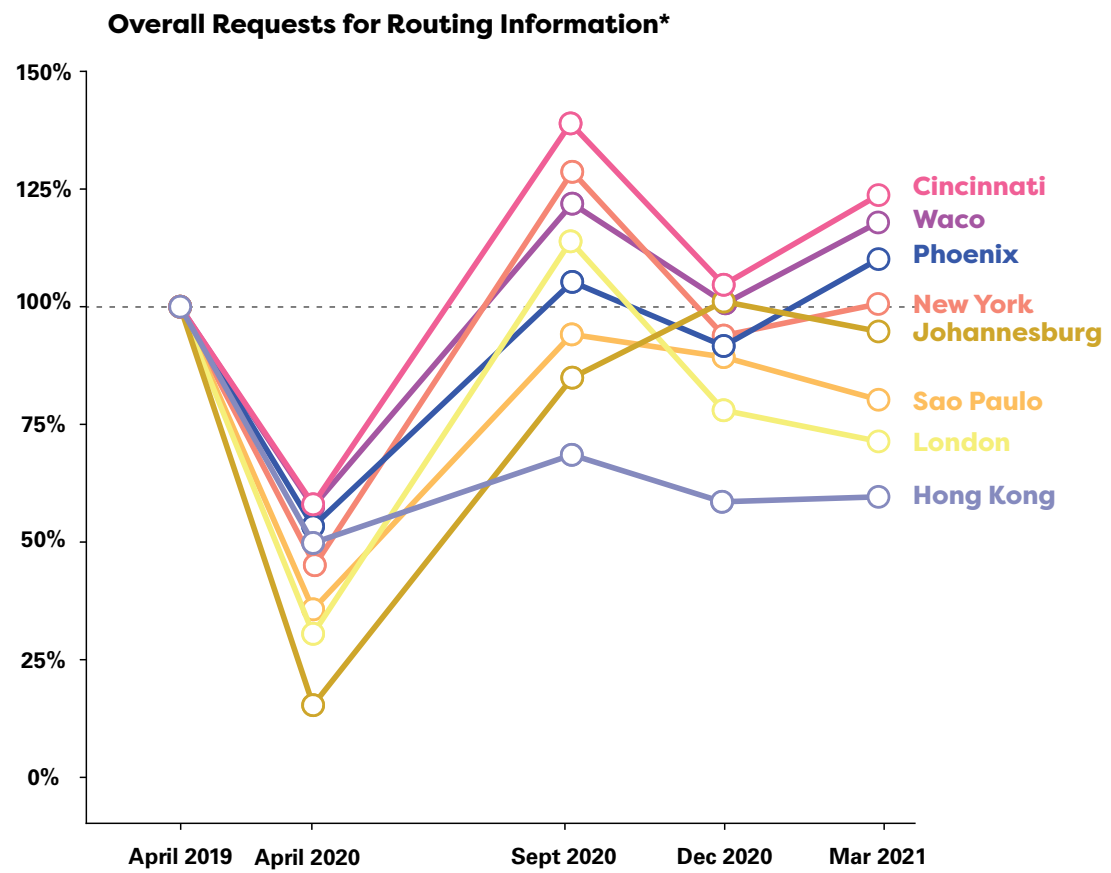


% Change in Trip Volume (compared to April '19)

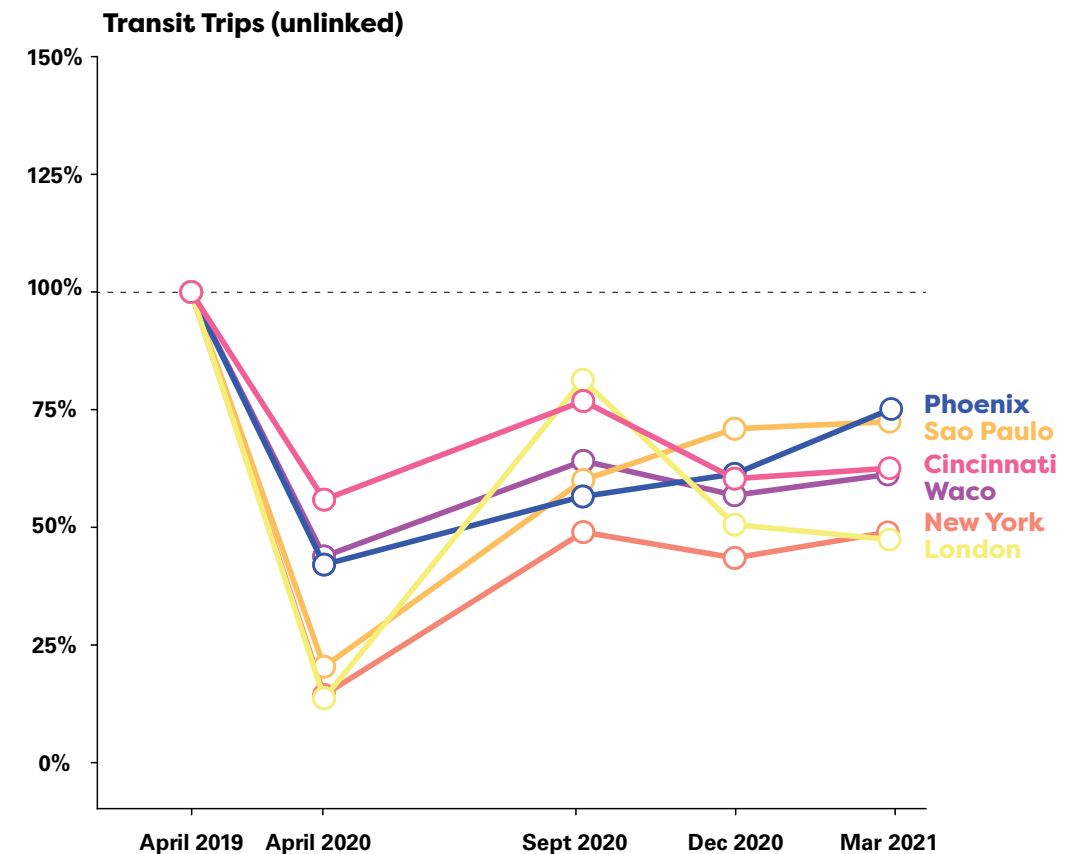
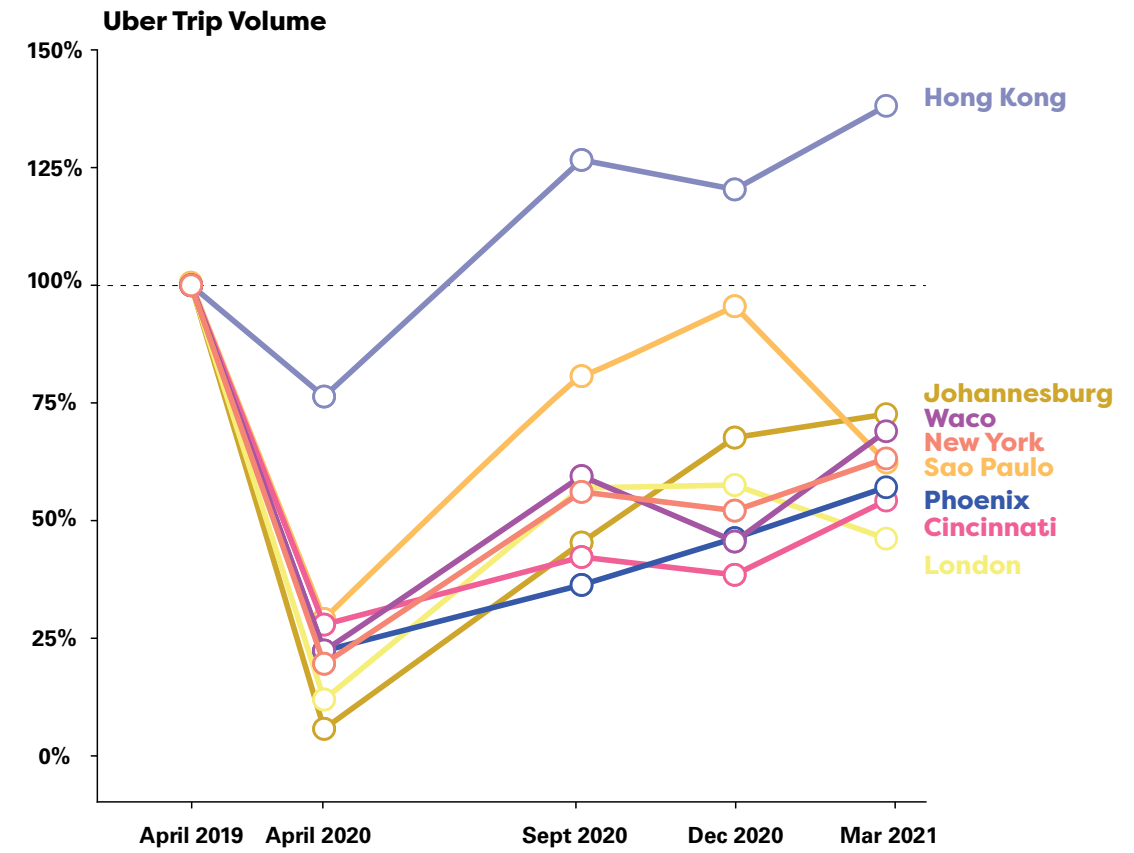


3 Uber and Transit lag behind vehicle miles traveled (VMT)

In mid-2020 and again in March 2021, VMT recovered above normal levels in many places, indicating that more people were driving than taking transit or shared mobility. Uber's recovery pattern closely follows that of transit in most markets, rather than tracking with VMT and private vehicles.

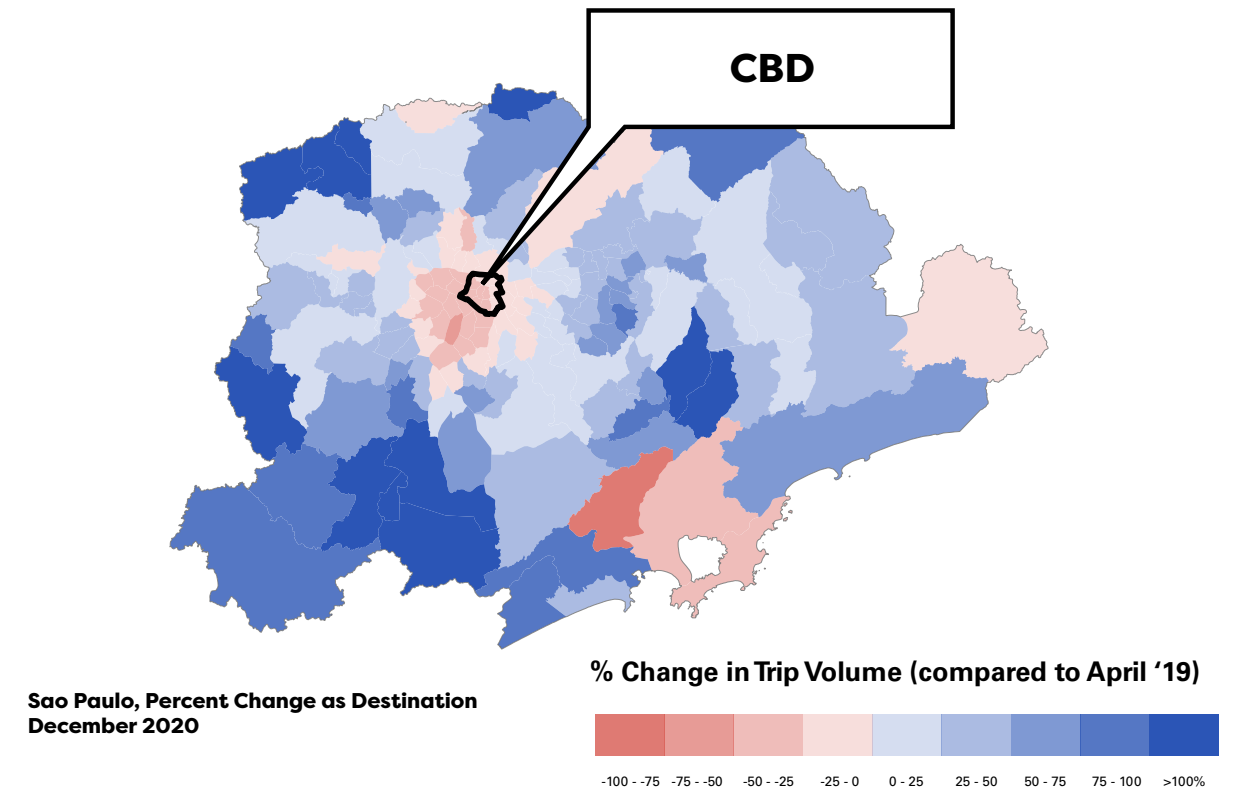
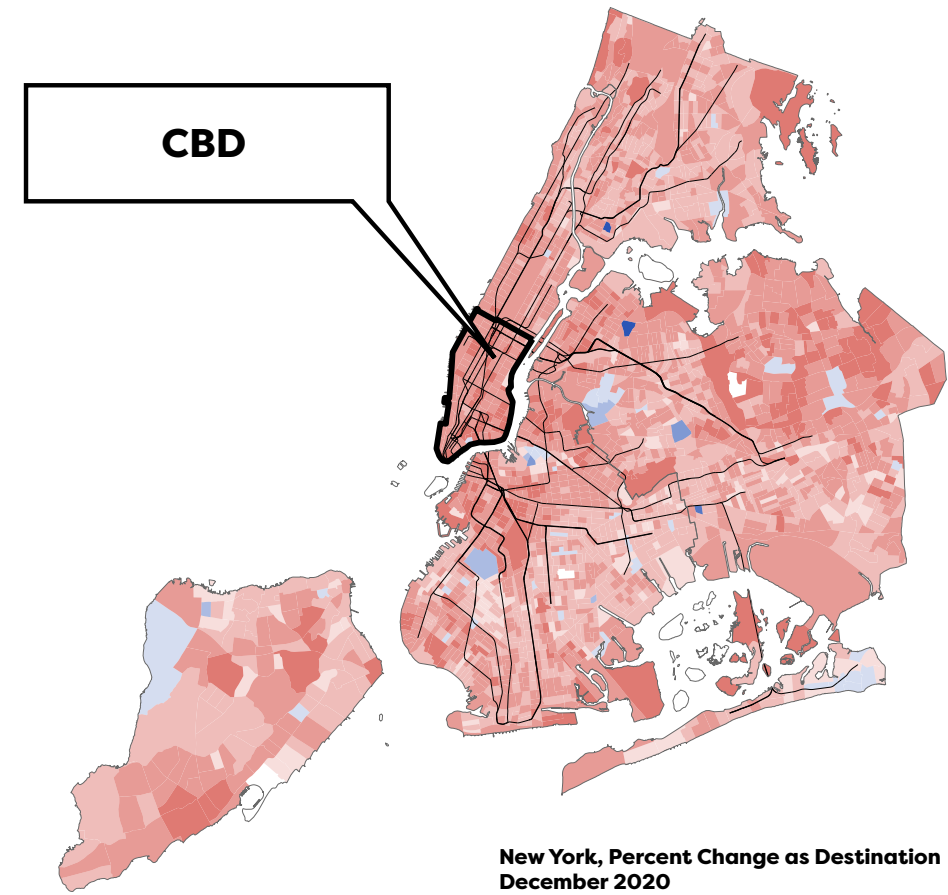
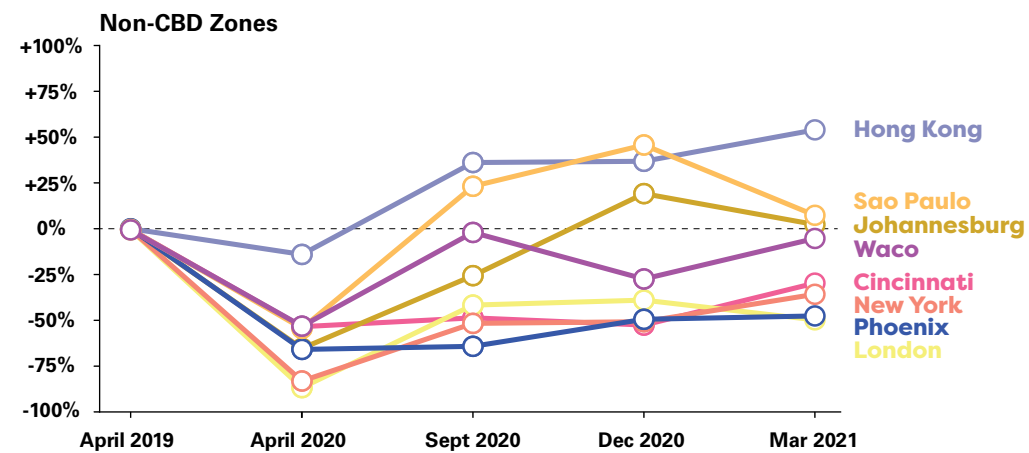
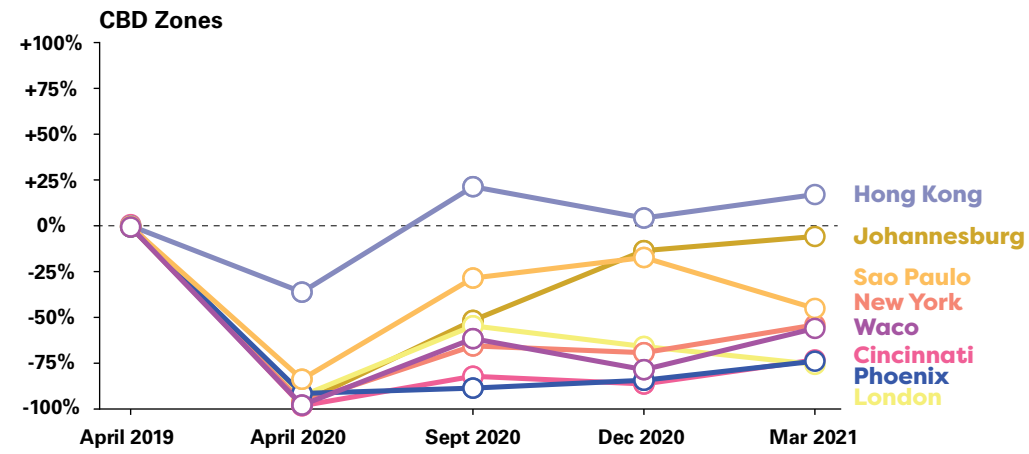


*Based on Apple Maps data



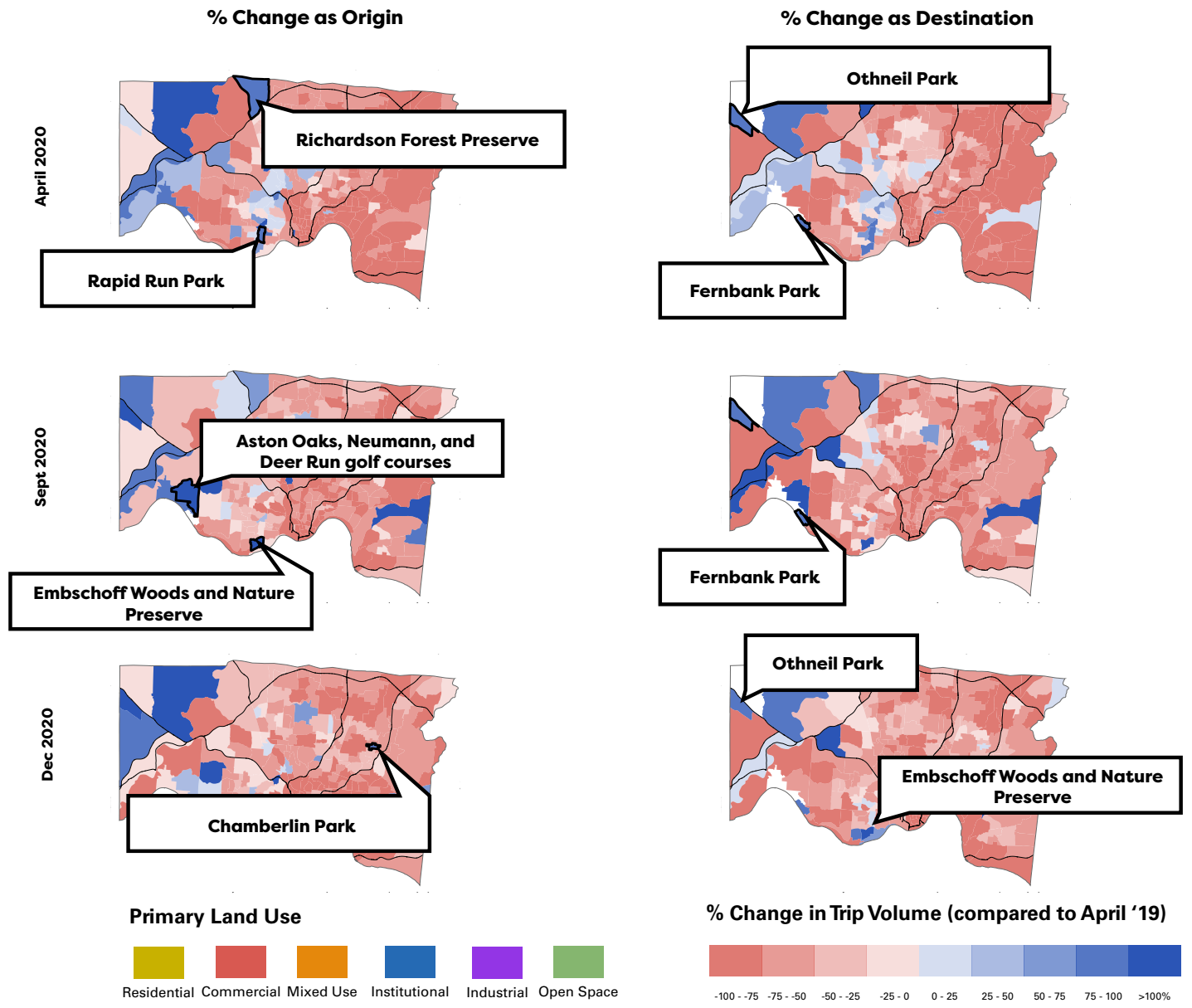
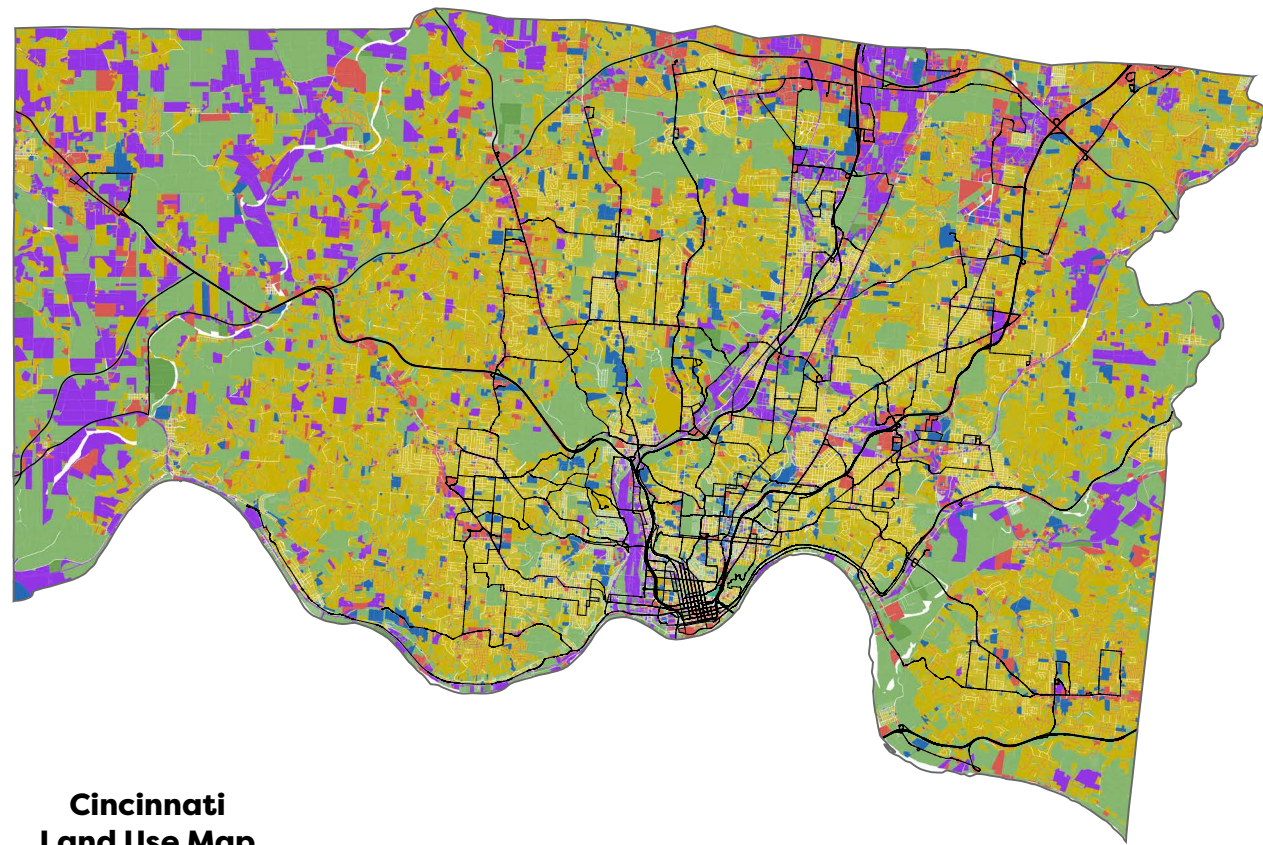
4 CBD recovery is lagging

As Uber trips have recovered, their recovery has lagged behind in traditional central business districts, especially those dominated by and reliant upon office workers. Some geographies exhibit a “donut hole” characteristic, with peripheral travel increasing, but avoiding the central city.



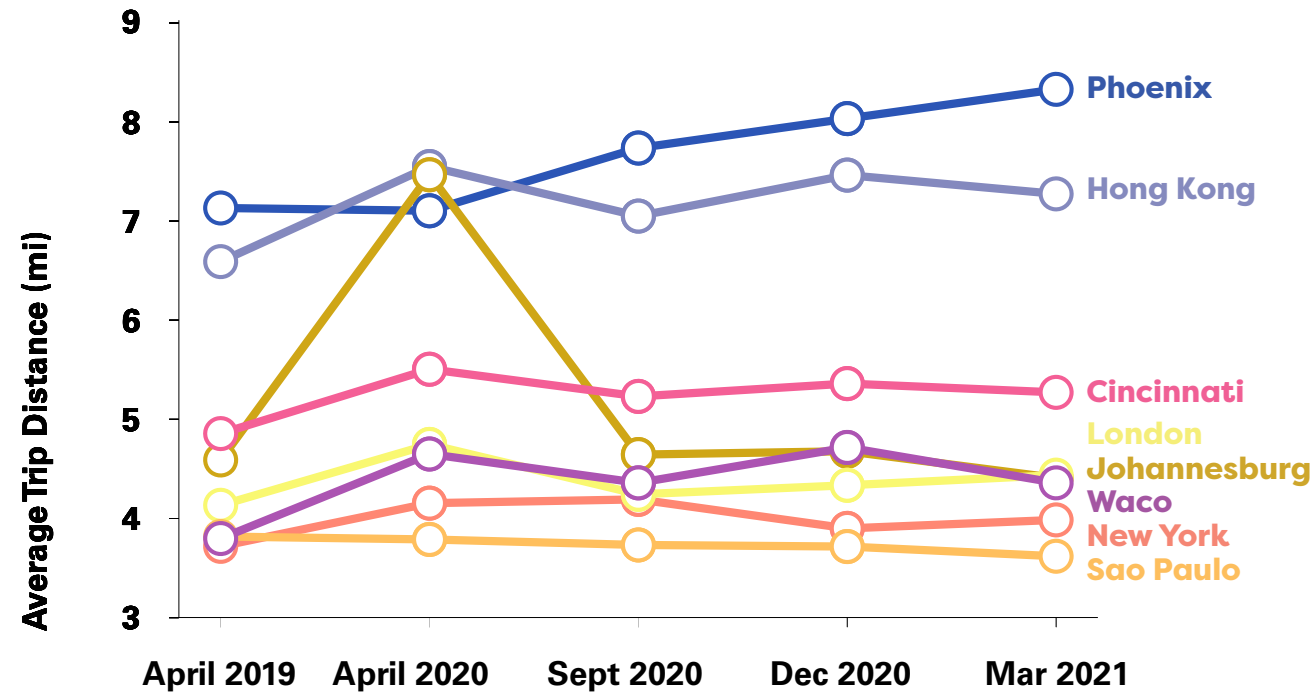
5 Open Space Destinations

Many riders used Uber during the pandemic to access open spaces in the core and at the periphery of cities. Uber provided an important link to natural resources during lockdown, including major parks, beaches, and hiking areas.

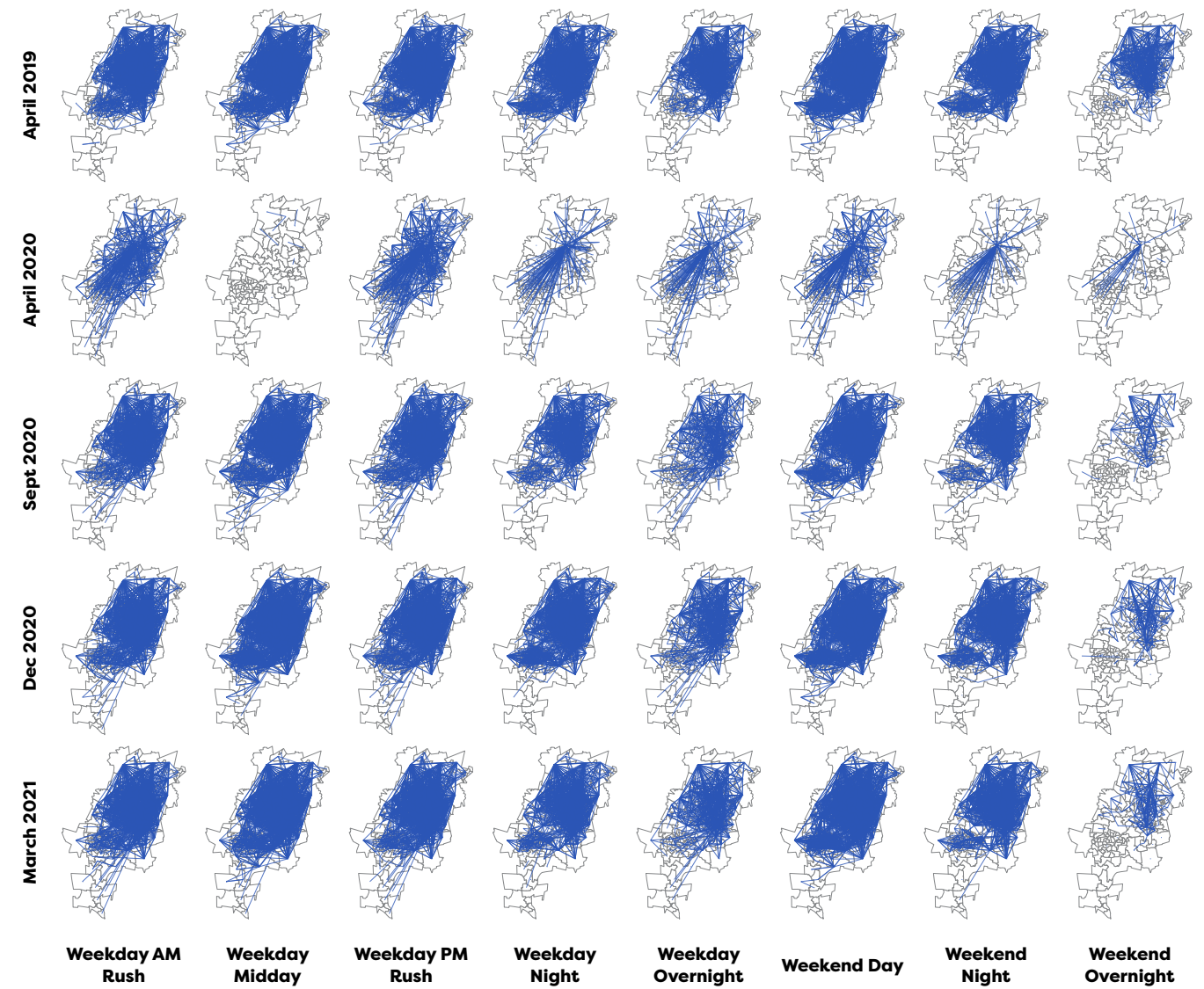


6 Trip distances saw limited fluctuations

In contrast to what was initially expected, in most geographies, average trip distances changed relatively little. In a few places, trip distances increased marginally at the start of the pandemic, but later returned to normal levels.

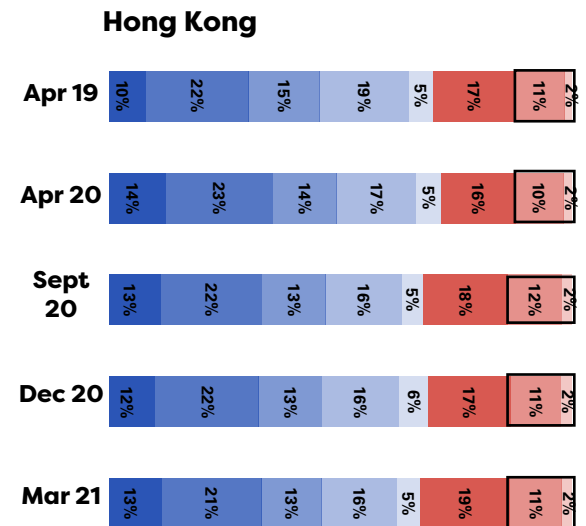
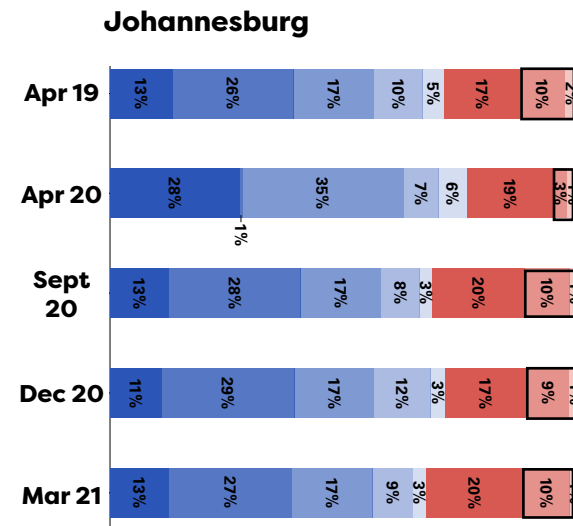
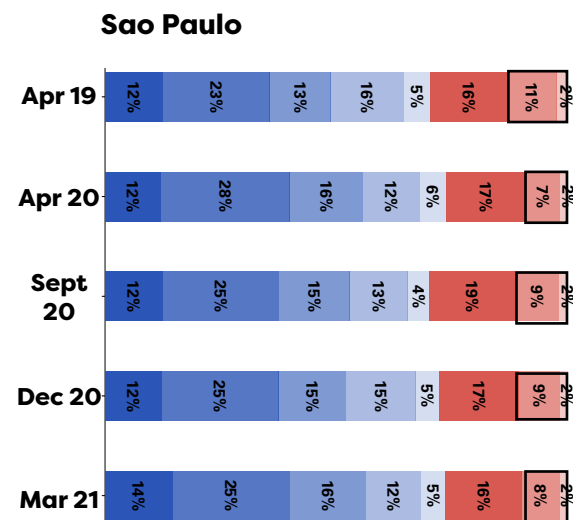
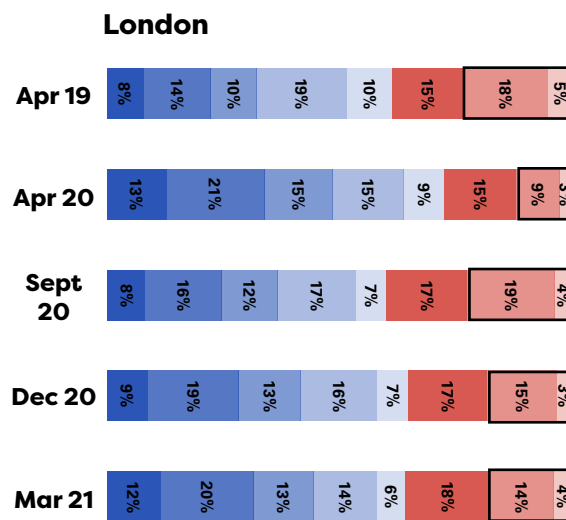
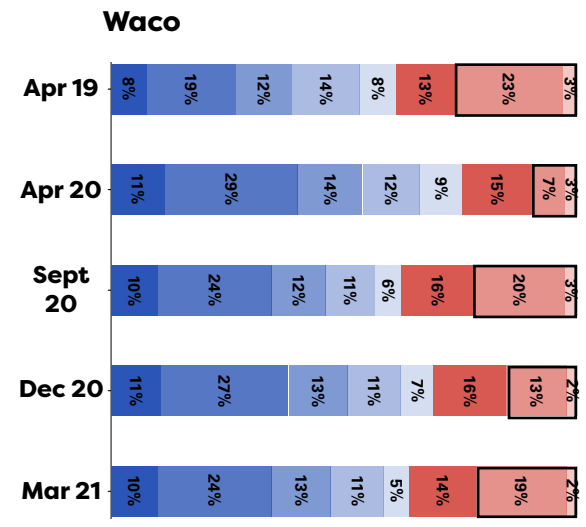
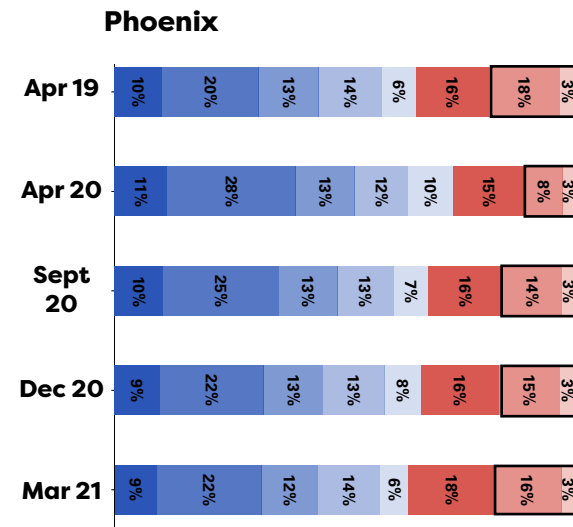
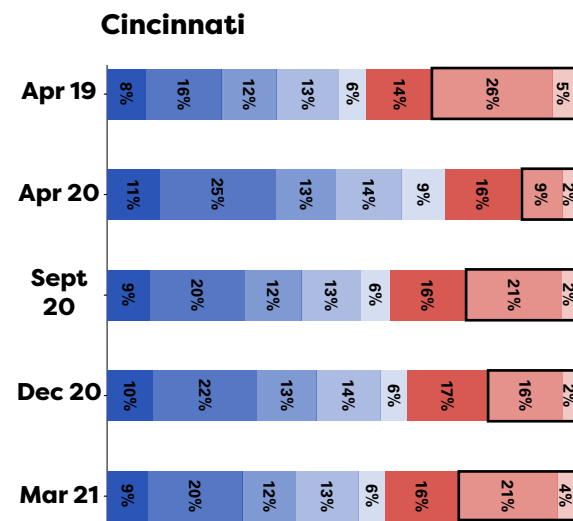
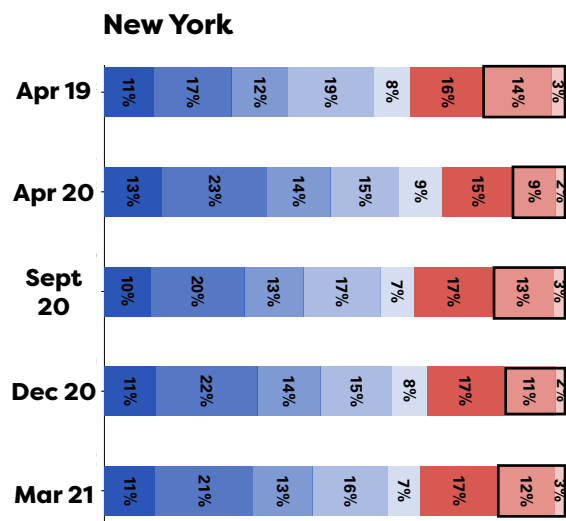


Johannesburg Origin-Destination Flows



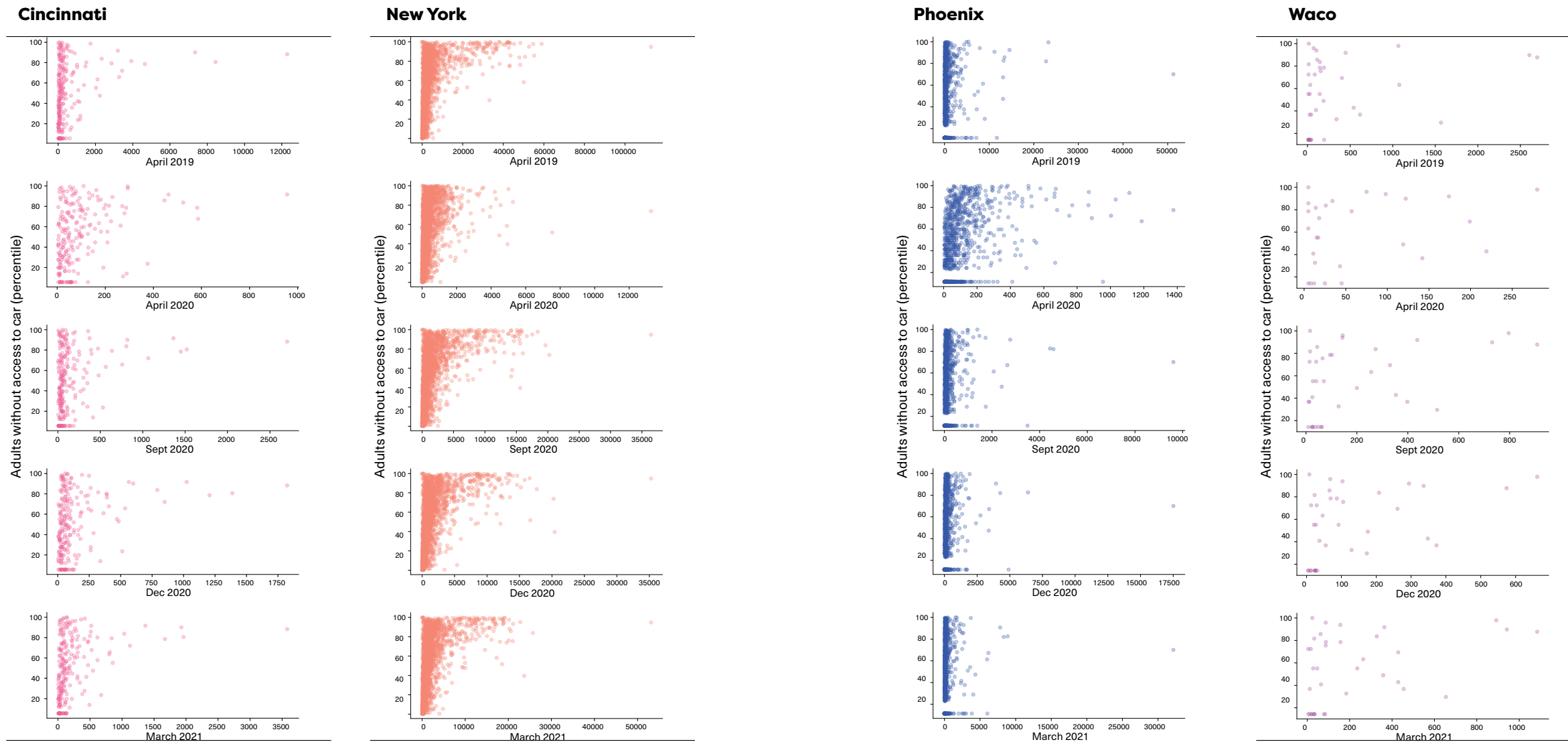
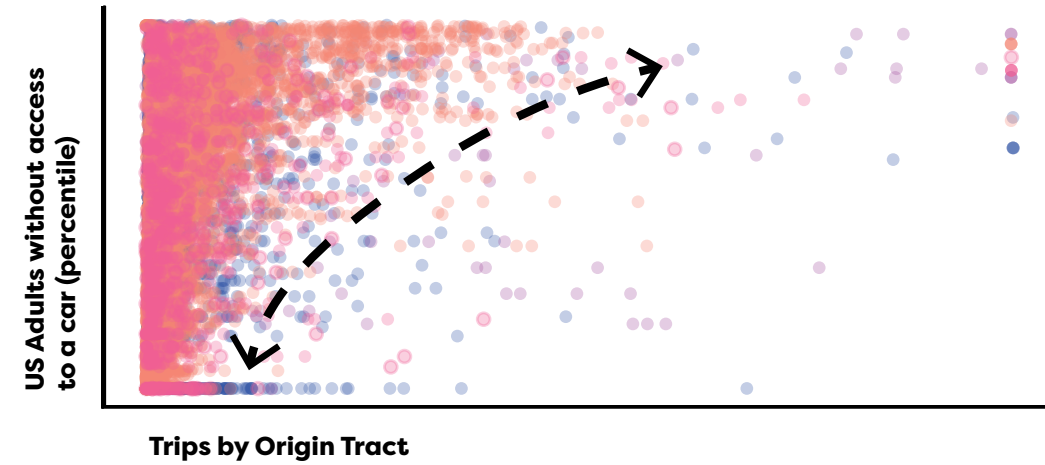
7 Trip time distribution

In contrast to what was expected, trip time distribution changed marginally, with an initial drop in weekend and weekday night trips, followed by a return to relatively normal trip distribution patterns.



8 Car ownership rates drive Uber usage

Both before and during the pandemic, lower rates of car ownership were strongly associated with Uber usage. These trends were exacerbated during the pandemic, as public health concerns around social distancing mounted.



Conclusion

Conclusion



Uber stands at an important crossroads in its growth trajectory. Following the pattern of transit agencies and cities who have seen revenues fall as the daily rhythm of cities has gone out of sync, Uber has an opportunity to rethink and reimagine the role that it plays as cities emerge from the pandemic.

The future of cities and urban areas is bright. Globally, the balance between rural and urban areas still points towards greater urbanization, greater opportunity, and greater wealth. To date, Uber's role in cities has been that of a platform and a market shaper. As a pioneer of the ridesharing industry and an innovator, Uber has shifted the transportation field from a focus on fixed-route services mismatched with prevailing land use patterns to a paradigm that challenges conventional notions of car ownership and utility. The emergence of micromobility, trip planning, and other MaaS tools has given consumers more options than ever.

Cities will recover in the post-COVID future, but many things show signs of slow but significant change, including work, retail, and regional development patterns. The overall number of trips to central business districts, malls, and other centers may never fully recover.

Nevertheless, the pandemic has opened the door to new paradigms and potentials for innovation. As more low-income riders use Uber as a service, the argument for further enmeshing Uber into transit and shared mobility services is clear. Uber has a clear opportunity to fill a "utility" gap and transform many of its services from luxuries into routine services that people rely on for errands, work, and day-to-day transportation needs. To fill this gap, Uber will need to create strategic partnerships with carsharing providers, transit agencies, micromobility operators, and microtransit services. By creating a critical mass of services that can supplant trips by private vehicle, Uber stands to win a higher share of the market and transform itself into the leading Mobility-as-a-Service provider.

Beyond the digital platform, Uber should continue exploring and building partnerships with cities and developers to test new and innovative types of mobility hubs, subscription formats, car-free developments, and curbside management services. Collectively, these new innovations can better adapt Uber to the polycentric urbanization that is becoming ever more prevalent globally, while also offering alternative lifestyles to conventional suburban markets in the US and globally.

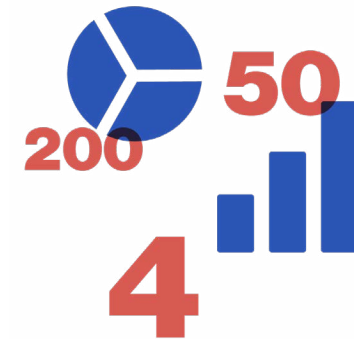
Appendix

Goals



Assess

Assess how Uber's Rides business reacted to the pandemic by looking at 8 global case studies and reviewing the most recent literature on post-pandemic mobility



Analyze

Assess key questions around Uber's role in the future of cities, using data from April 2019 through March 2021



Project

Based on compiled data and literature, project how Uber's role may change and how it could adapt to new strains of thinking around cities after the pandemic



Envision

Envision several new "frontiers" for Uber's platform that build on existing trends and anticipated changes in cities

Audience

This white paper was developed with Uber staff for an internal audience. While many of the findings here are useful internally for business development, market research, and trends forecasting, many of these images, findings, and ideas are designed for Uber to communicate how it understands cities and its role within them to a larger audience. The paper's audience is divided into three primary groups:

Internal Decision Makers and Leaders at Uber

Decision makers at Uber who can help inform future trajectories for the platform and as a result, can heavily influence the nature of the ridesharing industry in cities globally.

Uber Research and Local Policy Teams

Internal staff and researchers at Uber who can use these findings to inform and challenge their work and to project key trends in their local areas.

External Policymakers and Cities

This white paper expresses Uber's attitude towards and understanding of the future of cities and mobility. As a result, it can serve as a useful document and means for Uber to communicate its goals and ambitions as a company to a wider policy audience, including city officials.

Methodology

The research team produced this report using a mixed methodology that included a detailed literature review of current trends and an analysis of eight cities using aggregated data provided by Uber. Literature review focused on research into the current and projected impacts of COVID-19 on mobility and the built environment. This investigation focused on research literature developed between April 2020 and April 2021, but also looked back at research on trends and the built environment prior to 2020.

Research explored key themes that relate to Uber's core mobility business, including emerging and new mobility, transit, and technology. Supplementary contextual research investigated peripheral trends that impact Uber's business, such as regional development, land use, and changes in retail and logistics. Across these themes, the research team looked at scholarly papers, consumer reports, and opinion articles to gain a broad view of how different experts in the field anticipate urban development evolving after COVID-19.

In parallel, the research team worked with Uber to obtain data for eight cities globally, with a mix of different types, sizes, typologies, and mode splits. These cities included New York City, London, Hong Kong, Sao Paulo, Johannesburg, Cincinnati, Phoenix, and Waco (TX). Origin-Destination data was aggregated for five months (April 2019, April 2020, September 2020, December 2020, and March 2021). Using Census data and American Community Survey Data from 2010-2020 (along with international equivalents), the team explored how the pandemic impacted Uber's overall Rides business and explored the relationship of these impacts to transit, demographics, income, and land use.

Trends Analysis

Future of Mobility

Key Finding: Mobility options are diversifying, growing smarter, and more app-enabled, allowing people to consume new mobility in more flexible ways and with greater ease than ever before.

Over the past decade, the mobility landscape has experienced a rapid and unprecedented transformation. Increasingly, mobility is understood not just as a product for purchase but as a service to be consumed, leading to the emergence and proliferation of app-based mobility-as-a-service (MaaS) platforms globally. The market for MaaS is diverse and includes scooter, moped, bike share, carsharing and rental services, ridesharing and taxis, and in some markets, public transit. At the same time, in some contexts globally and especially in US cities, traditional public transit systems have witnessed declines in service and ridership, without significant investment in new technology, on-demand service, or operational changes beyond limited but successful bus network redesigns. While car sales continue to drive many national economies and are growing in many geographies, a new generation of users has signaled a shift away from traditional models of ownership towards service models that allow greater choice and flexibility across modes.

As MaaS models have evolved, the mobility landscape has become far more integrated, connected, and seamless. As a result, TNCs and other mobility providers find themselves uniquely positioned between the public sector, Original Equipment Manufacturers (OEMs), and consumers to offer a comprehensive range of options for any mode a user might desire to travel by. As a diverse range of public and private mobility options become integrated with consolidated apps or operators, experts project a significant uptake of MaaS bundles, in which users pay subscription fees in exchange for pre-determined mobility allowances or discounts. Such bundles may be configured in a multitude of

ways or may even be customizable, with benefits encompassing a range of mobility alternatives ranging from bike sharing to rideshare and mass transit. Integrated and responsive mobility pricing with well calibrated incentives can help ensure that new mobility emerges in a way that is equitable and accessible to all.

Despite the potential benefits of an integrated and universal MaaS system, several critical barriers remain. Car ownership and car-dependent land use patterns, especially in the US, continue to depress the overall market for MaaS in all but the densest cities. Widespread MaaS adoption will need a policy framework that fosters its adoption and creates the right physical and digital infrastructure for healthy competition. Cities and states remain at an impasse over how best to integrate ridesharing into the larger transportation network, with some calling for widespread oversight and data-sharing at all levels of government and others taking a laissez-faire approach. A shifting landscape of micromobility providers, including new scooter companies with competing separate apps, have demonstrated the pitfalls of unintegrated technologies and services, resulting in a chaotic shared mobility field with too many competitors and applications in small markets. Bike share systems have taken the opposite approach, with new entrants quickly entering and then leaving the market as exclusive contracts have eliminated competition and forestalled innovation beyond e-bikes in many large US markets. Many transit agencies, which arguably have the most to gain from substantive partnerships with ridesharing companies, have yet to fully embrace or understand how their services can interact with ridesharing, even though many users regularly supplement bus and transit trips with rideshare, especially at off-peak times or in transit inaccessible areas.

The equity implications of these combined trends are problematic and were exacerbated by COVID. Severe service cuts left many transit riders with few options other than rideshare, especially in places where walking and biking are unsafe, burdening low-income households already predisposed to job loss and poverty by the pandemic. Partnership, integration, and experimentation are critical to creating greater resiliency within our mobility systems, and rideshare has a strategic and critical role to play in shaping and leading those efforts.

1 Transit Hardships

The COVID-19 pandemic has exacerbated pre-existing declines in public transit ridership, endangering underfunded transit systems and hurting the most vulnerable riders.

Over the past decade, public transportation systems, with few exceptions, have witnessed widespread declines in ridership. The reasons for these declines are complex, including economic growth, persistent service cuts, low-cost car financing, rideshare expansion, and uptake of bikes and scooters. Net bus ridership across the U.S. has declined as much as 12%, and rail ridership 18% (Erhardt et al, 2021). The financial implications of decreased public transit ridership have significant consequences for private mobility providers including Uber, as a robust public transportation network is critical to the emergence and evolution of shared mobility in many markets.

COVID-19, meanwhile, has exacerbated preferences for private vehicle use over shared mobility and public transit. The McKinsey Center for Future Mobility found that users' topmost transportation priority is now "reducing the risk of infections," surpassing both price and travel time. In addition, half of respondents to a recent IBM survey intended to make significantly less or zero use of shared mobility, including public transit, even once all public

health restrictions are lifted, likely in part--if not primarily--due to the same factors.

According to 2020 research from Zipcar, 4 in 5 residents of American cities now say it is "essential" to have access to a car.

2 Shared Mobility Growth

Although public health concerns have contributed to a surge in demand for private vehicles, the market for shared mobility is still poised to see continued growth.

Despite the COVID-19 pandemic, the market for shared mobility is still projected to grow over the next several years. Inclusive of mobility services such as bike-, moped-, and scooter-share, Emergen Research anticipates that global shared mobility revenues may reach \$523.6 billion by 2027, with a compound annual growth rate of 26.3% as measured from 2019 levels. Were a high-disruption scenario to occur, with shared autonomous vehicles coming to replace a great number of today's single-occupant vehicle trips, they project that the number of passenger vehicles across the U.S. would drop from 247 million in 2020 to 44 million in 2030, although VMT may remain the same or even increase.

In stating that "a third of consumers value constant access to a private vehicle more than before COVID-19," Furcher et al. carefully predict a future of mobility defined not by vehicle ownership but by vehicle access, and one in which MaaS providers are sure to play a critical role. In an endorsement of this prognosis, the McKinsey Center for Future Mobility projects that shared mobility will bounce back from the pandemic, albeit slowly at first, gaining at least 1 to 2 percent in ridership from pre-pandemic levels "when normal life returns."

3 Consolidation & Integration

If mobility services consolidate into unified trip planning and payment systems, operators may be positioned to collect more holistic user information on a larger scale than ever before, sparking concerns about data-sharing and privacy.

Many mobility experts view payment and trip planning integration as critical to the eventual expansion of mobility-as-a-service. As demonstrated by consolidated payment cards like London's Oyster card, consolidated payment can ease transfer challenges and create a more seamless customer experience. Nevertheless, little consensus exists as to how comprehensive MaaS systems will actually come into being, who will manage them, and what that means for consumers. Many transit agencies maintain outdated back-end payment systems that make payment integration challenging in the near term. At a basic level, many researchers expect to see increasing integration as a sign of a mature market, as smaller competitors are consolidated into larger and more diverse shared mobility apps. Uber's acquisition of JUMP Bikes (now Lime) and current partnership with Lime and City Scoot, along with Lyft's acquisition of Motivate, are early examples of this phenomenon. Integration of transit partnerships and trip planning services are a logical evolution for ridesharing companies but have been forestalled by fears around data-sharing and privacy, loss of competition, and reticence among conventional transit operators.

4 Dynamic Pricing

Advanced mobility and congestion pricing may be critical to encouraging greater equity as well as a sustainable balance of use intensity between different modes.

Mobility pricing may prove a crucial tool in promoting behaviors which contribute desirably toward goals around greater equity in public health, urban design, congestion intensity, and a host of other concerns. Dynamic, targeted mobility and congestion pricing has the potential to encourage behaviors that contribute to a beneficial balance of transit modes and greater equity in terms of congestion, access, the urban form, and more. Authors for TransitCenter write that mass transit serves as the “backbone” of an affordable and equitable transportation network, and there is widespread optimism that emerging mobility will support, and not decimate, the use of public transportation, often filling in first- and last-mile gaps that transit agencies are ill-equipped to address well or efficiently, such as specific bus routes or paratransit services. Mobility pricing has the potential to account for “the full environmental and network impacts of a journey” (Barrett, 2019) and to encourage multimodality through bundled services or other incentive schemes potentially pinpointed even to specific groups or locations; these technological tools may induce small changes in consumers’ behavior, and eventually add up to catalyze greater equity in mobility, environmental justice, and urban design.

5 Electric Micromobility

Bikes, scooter, and e-bikes saw significant gains during COVID, signaling a shift towards private, clean mobility options that offer additional flexibility.

COVID-19 caused a significant spike in the overall sales volume of bikes, e-bikes, and scooters, as many individuals sought out smaller personal vehicles for recreation and in place of transit trips. Bicycle sales grew 65% in 2020 over 2019 levels and e-bike sales grew 145% in the same period (World Economic Forum, 2021). In many cities, bike share and scooter systems played an important role for local trip-

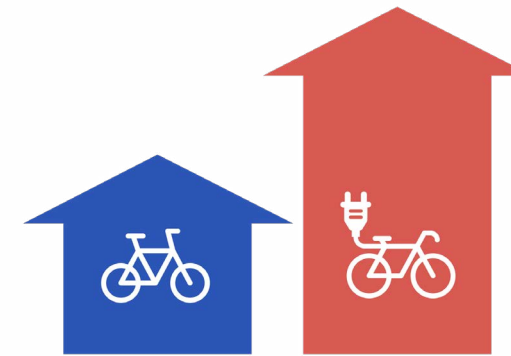
making, recreation, and leisure, providing people with a socially distant option for traveling. New micromobility options offer a significant opportunity to enhance last mile trips, serve trips less than 3 miles, and enable neighborhood-scale travel.

6 Persistent Car Ownership

Car ownership rates remain high and pose a persistent and lasting challenge to all kinds of shared mobility, including rideshare and transit.

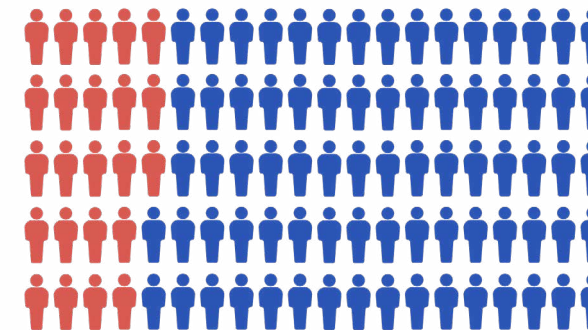
Despite the proliferation of a range of new shared mobility options, in the US, rates of car ownership and commuting by single occupancy vehicle remain stubbornly high. 83% of US adults drive frequently and 64% drive every day (Gallup, 2018). By comparison, only 5% of people take public transit to work daily and only 3% bike or walk.

Understood within this larger context, the role of rideshare pales in comparison to private vehicles, yet nevertheless has an outsized role in shaping the mobility landscape of the future, which will increasingly rely on data-enable services, automation, and real-time choice as opposed to traditional vehicle ownership models, especially as automation becomes more central to mobility policy and technology.



145% sales growth in e-Bike and 65% for bikes vs. 2019.

Sales of e-bikes grew 145 percent in 2020 compared to 2019, outpacing sales of all bikes, which were up 65 percent” over the same period. (World Economic Forum, 2021)



Only 23% of workers without a bachelors degree say their work can be done from home.

62% of educated workers say that their work can be done from home. (Pew Research, 2020)

OUTLOOK

Potential Outcomes

- Cities see continued declines in transit ridership as public health concerns persist and other options become more competitive.
- Continued growth in the shared mobility market, with ridesharing, scooters, bike share, and other services expanding and diversifying.
- Increasing consolidation of mobility services and trip planning services, with payment integration and mobility bundles.
- Adoption of Mobility-as-a-Service models for integrated payment, through trip planning apps, municipally backed applications, and ridesharing applications.
- Increasing adoption of dynamic pricing applications to shift travel behavior and create a real-time market for transportation.

Parking & Curbside Management

Key Finding: Since the start of COVID-19, parking spaces around the country have sat empty. Meanwhile, cities have reappropriated streets, parking and curbside space as public seating, dining streets, and other uses. These experimental pilots likely offer a glimpse at the future of parking in American cities—which is expected to shift considerably as a result of new approaches to curbside management and parking minimums, shifts in commuting habits, and the longer-term adoption of autonomous vehicles.

In the first months of COVID-19, parking volumes plummeted across the U.S., decreasing by 80-90% (Goldman, 2021). Though parking transactions increased later in the year, they have still not returned to pre-COVID-19 levels—particularly outside of large, dense cities where trips are more frequent and more essential workers are employed.

Decreased trips and the need for social distancing during the pandemic have prompted many cities to re-appropriate curbside parking spaces for outdoor dining, pedestrian access, and other uses. Curbside space is a critical asset for cities to create public space and accommodate a more diverse range of modes and functions, including pick-up/drop-off, curbside deliveries, bike share, bike parking, and scooters, among other uses. Many cities have already adopted dynamic curbside management approaches that allow curbsides to be maximized for a range of uses and users throughout the day.

These future curbside uses can more seamlessly integrate Uber's various service models into urban streetscapes: from UberEats deliveries, to rideshare pick-up/drop-off, to shared micromobility options. In addition to the rethinking of on-street parking and curbside space, cities may see a decrease in demand for parking of all kinds, a trend that will be aided and accelerated by the uptake of automated vehicles (AVs). The planning and design of parking facilities will likely need to evolve in response to an automated landscape in which shared, electric, and autonomous mobility is central to how people plan cities and move through them.

“Zoning ordinances have coded for ultimate parking convenience at the expense of other values.”

“Prioritizing better use of space dedicated to parking for cars is critical to reducing greenhouse gas emissions from cities.”

- Institute for Transportation and Development Policy (report by Martha Roskowski)

1 Parking Conversion

Parking spaces of all kinds may decrease in response to changes in mobility, development, and commuting, as well as the rise of autonomous vehicles and charging infrastructure.

Over the next decade, shifting trends in shared and autonomous mobility, combined with the changing geography of housing and work, may contribute to a reduction of parking spaces in cities. Some studies project an 80-90% reduction of parking in urban areas, due in large part to the rise of autonomous vehicles that would not require the same amount of parking space or time. This may prompt the conversion of many parking facilities to other uses in the future. In a high-disruption scenario based on the impact of autonomous vehicles, urban areas could see a 67% reduction in vehicle ownership and up to a 60% reduction in destination parking (Smith, ULI, 2020).

The degree to which parking is reduced will vary according to a variety of factors. A 2018 study found that the reduction in personal vehicle use will vary across cities according to residential density by area and overall, with the largest impacts possible in more densely populated areas. The study found the following potential reductions in personal vehicle commuting trips in each of three Metropolitan

Statistical Areas (MSA): New York, 46 to 60 percent; Los Angeles, 36 to 44 percent; and Dallas, 21 to 31 percent (Driverless Future, 2018). This reduction in personal vehicle commutes would impact parking demand considerably.

In Singapore, as many as 86% of parking spaces are projected to be eliminated due to a combination of these trends (World Economic Forum, 2020). This equates to a decrease of nearly 14 square kilometers of parking space. Vacated/repurposed parking spaces present potential for urban and public realm design, local business use, active mobility, and more.

2 No More Minimums

There is an over-abundance of parking in the United States, a trend perpetuated by zoning and parking minimums.

It is estimated that there may be as many as 2 billion parking spaces in the United States (ITDP, 2021). In most U.S. cities, from Jackson, Wyoming to Los Angeles, California, parking spaces outnumber households. In others, as much as one third of land area is occupied by parking spaces. Given the over-supply of parking in the U.S., a sizable amount of parking space remains unoccupied every day. In Seattle, for instance, daily parking space occupancy ranges from about 43 to 64 percent (Scharnhorst, 2018).

Transportation experts surveyed in 2021 by ITDP pointed to an excess in parking supply as the greatest challenge to efficient planning and an obstacle to increasing access to uses like affordable housing, parks, and open space.

The over-abundance of parking is perpetuated by parking minimums mandated in zoning codes, which often require more parking than is needed. Parking minimums are often arbitrary and out of

sync with demand, and do not generate tax revenue that other uses, such as commercial and industrial, do—occupying “unproductive” land that does not return revenue to cities. Parking minimums create added expenses for developers—a single parking space can add 20% to the cost of developing a housing unit—which has discouraged development and additional density in some regions (ITDP, 2021). Cities like Buffalo, Hartford, and Miami have seen success in reducing or eliminating parking minimums to encourage and diversify much-needed new development.

“After decades of requiring parking for new construction, car storage has become the primary land use in many city areas.”

- Eric Scharnhorst, “Quantified Parking: Comprehensive Parking Inventories for Five U.S. Cities,” 2018

3 Searching for a Spot

Americans spend a sizable amount of time searching for parking, and this contributes to pollution and congestion in cities.

It is estimated that Americans spend a total of 17 hours each year searching for parking, an activity that wastes time and fuel, and adds to emissions and congestion in cities. In urban areas, this figure increases considerably; for instance, in New York, drivers spent 107 hours each year searching for parking—the equivalent of \$2,243 in wasted time, fuel, and emissions (Deloitte, 2018).

Approximately 99% of parking in the U.S. is free (ITDP, 2021). Transportation policy experts suggest that free and underpriced public parking incentivizes people to drive and to circulate to find unoccupied spots, which leads to unnecessary CO2 emissions,

poor air quality, and increased traffic. Parking charges also act as a regressive tax, placing the highest burden on the lowest-income drivers.

The average American spends 17 hours per year searching for parking, resulting in a cost of US\$345 per driver in wasted time, fuel, and emissions. The average New York City driver spends 107 hours searching for parking each year, the equivalent of \$2,243. (Deloitte, 2018)

Across the US, 99% of parking is free. (ITDP)

4 The Advents of AVs

Autonomous vehicles may significantly impact the usage and design of on- and off-street parking.

In the future, a proliferation of autonomous vehicles may drastically change the demand for and design of parking. By 2040, more than half of all miles traveled in the U.S. might occur in shared autonomous vehicles. These vehicles would rarely need to park and would not need to sit idle throughout an entire workday, thus decreasing the need for parking. As individual riders require less parking—especially in urban areas—autonomous vehicles may present the need for different kinds of parking structures. Parking may be required to maintain or store shared AV fleets, as well as for other uses such as pick-up and drop-off zones and EV charging stations. Parking facility developers are increasingly aware of the need to build facilities adaptable to these future needs.

5 Curbside Reclamation

Cities are increasingly recognizing the need to expand the use of the curbside beyond personal vehicle parking.

COVID-19 prompted city leaders across the country to adapt curbside space to serve residents and businesses during a public health crisis. To meet the demands of the moment, city governments and stakeholders were able to pause or reimagine would-be constraints (such as outdoor dining permitting, and resistance to converting on-street parking).

Curbside transformations across the country have provided valuable lessons learned about inter-agency collaboration, equity and community engagement, street and public safety, permitting processes, and public health. Many cities have already begun to assess the potential to turn these temporary interventions into long-term changes. A 2021 report by Transportation for America looked at curb transformations during COVID-19 in upwards of 20 cities, documenting valuable lessons learned during the pandemic, and offering recommendations at the federal, state, and local level to encourage long-term adoption of these emerging practices in curbside management.

“COVID-19 accelerated some of the changing uses of and growing demand on the curb already underway, and shined a light on the immense value of the curb and its crucial role in preventing the spread of COVID-19.”

- “COVID and the Curb” T4A

OUTLOOK

Potential Outcomes

- Changing paradigms of curbside management activation open the door to enhanced pick-up drop-off zones and other uses.
- Dynamic curbside pricing and curb “coding” create opportunities for more dynamic pricing and usage of the curb, efforts that could be supported by Uber’s knowledge of curbside activity and congestion.
- Elimination of parking minimums open the way to new development, creating denser cities and more active downtown districts.
- Automated vehicle uptake causes a rethinking of traditional parking structures to house AV fleets and other functions.
- Parking is now the dominant land use in most cities. Uber should focus local policy pressure on eliminating parking minimums and free parking. Parking availability at the destination is directly correlated with the choice to use Uber instead of a personal car.

Transportation Equity

Key Finding: COVID-19 highlighted the importance of addressing transportation inequities and revealed the prominent role rideshare may play in filling in transportation gaps. During the pandemic, public transit ridership plummeted, impacting low-income people and people of color who rely disproportionately on these services.

While inequities in the transportation system existed long before COVID-19, the pandemic revealed the network's tenuousness and importance—especially for marginalized communities and frontline and essential workers. During the pandemic, rideshare companies reported relative increased rates of use of their services by essential workers, people of color, people with disabilities, and women. Cuts in public transit and concerns about health and safety in light of COVID-19 have pushed more low-income families to consider purchasing a car. However these households face considerable barriers to car ownership, including high costs of insurance, car payments, and the cost of parking.

Transportation equity manifests itself in different ways in different contexts globally. Patterns of transportation use by race and class are hardly uniform and mode choice is driven not only by economic means but also by land use, job location, and infrastructure. Whereas many countries have invested heavily in public transportation services that ease the burden of transportation costs on the poor, the United States continues to see greater income inequality and economic disparities than many other countries, due in large part to entrenched segregation in housing markets and high costs of transportation.

“How can (low-income) residents get to jobs, health care, and other amenities if they potentially have to face a choice between taking a reduced-service public transit system and committing a significant amount of their income to purchasing a car?”

- Ezike and Burrowes, “Are Cars a Necessity? During COVID-19, Low-Income Households May Consider Public Transit Alternatives” (2020)

If trends of increased reliance on personal vehicles continue, low-income people and people of color may continue to rely disproportionately on public transit, rides from friends and family, walking, or occasional rideshare trips as compared to white and higher-income Americans. Low wage workers tend to have longer and more difficult commutes than higher wage earners. While it is projected that as many as a third of workers could work remotely in the future in some American cities, low wage and essential workers have continued to commute to their jobs during the pandemic and will likely continue to do so in the future. Low-income people and essential workers are less likely to have the option to work remotely, and more likely to continue to rely on rideshare and public transit to travel to work and for other essential trips.

In the United States, continued decline in public transit budgets and ridership, a trend already present before COVID, could further increase the reliance of low-income people, people of color, and people with disabilities on rideshare services like Uber. The gaps in rideshare use between lower-income and higher-income Americans could widen as more affluent Americans purchase and rely on personal vehicles in greater numbers.

Although marginalized groups have relied more heavily on rideshare since the onset of COVID-19, historically, rideshare services and shared mobility have been unable to address transportation inequities on their own. Companies like Uber should monitor trends related to transportation inequity in the post-COVID-19 city and consider new models of service to meet the needs of the communities facing transportation inequities.

“...microtransit has been a vital public resource for lower-income communities during the coronavirus pandemic. Looking ahead, the long-term socioeconomic reverberations of COVID-19 mean that affordable, convenient public transportation will remain absolutely critical.”

- Saar Golde, “Data proves that on-demand transit is essential for equity” (2020)

1 Longer, fewer commutes

Low-wage workers tend to face longer and more difficult commutes to work.

A 2021 Urban Institute report found that low-wage workers in four major U.S. metropolitan regions tended to reside in suburbs and have a high degree of mismatch between the location of their homes and workplaces.

Due to historically racist planning practices such as FHA housing subsidies and redlining, people of color and low-wage workers have experienced greater spatial mismatch between their homes and jobs. These communities also tend to live farther from city cores, where jobs and services are concentrated. These challenges are intensified for residents of public and subsidized housing, who face limited options for housing and are often left with no choice but to live far from where they work.

Late-shift workers face even more difficult commutes. Over 790,000 late-shift workers, who are disproportionately low-income and people of color, rely on public transportation to commute to work (Urban Institute, 2020). Average commute times for these workers are twice as long as those of workers with access to personal vehicles.

Average commute times for late-shift workers who rely on public transit are twice as long as for workers with access to a personal vehicle. (Urban Institute, 2020)

2 Car Ownership & Equity

Low incidence of car ownership is the greatest predictor of rideshare ridership rates in North American cities. People of color and low-income workers are less likely to own personal vehicles and more likely to rely on public transit.

Based on a study of Lyft ridership in Los Angeles, the most important determinant of rideshare usage is car ownership. Every 10% increase in the portion of households without a car is linked to a 7% increase in the number of trips taken by an individual rider in that area. This finding points to an equity issue, as car ownership is strongly linked to both class and race. In Los Angeles, majority-Black neighborhoods have the highest share of zero-car households (National Equity Atlas, 2021). And nationwide, people of color and low-income people are less likely to own personal vehicles as compared to the population as a whole. Black households in the U.S. are the least likely group to have access to a personal vehicle. Immigrant households of all racial and ethnic backgrounds are more likely to lack access to a vehicle compared to their U.S.-born counterparts—except for Black households.

Car ownership is rarely a matter of choice: 80% of car-free households in the U.S. say this is due to financial constraints, not personal preference (Mohiuddin, 2021). An estimated 60% of all transit trips in the US are taken by people of color, low-income people, and those who may not be able to own, operate, and maintain a car (due, for instance, to a physical or cognitive disability).

Low-income people and people of color face particular barriers to car ownership, including longer commutes to work, higher interest rates on car loans due to a perceived higher lending risk, and cost burden of car payments, which can comprise 10% or more of monthly income for low-income households.

“80 percent of car-free households in the U.S. point to financial constraints, not any personal choice, as the reason.”

- Anne Brown, “Redefining Car Access” (2019)

“An estimated 60 percent of the transit trips in the US are taken by people of color, people with low-incomes, and people who may not be able to own, operate, and maintain a car.”

- H. Mohiuddin, “Planning for the First and Last Mile...” (2021)

3 Declining Bus Ridership

In the United States, decreases in bus ridership and service raises significant transit equity questions.

Across the United States, cities were experiencing declines in bus ridership of 12-18% before COVID (Erhardt et al, 2021). Declining bus ridership has been attributed to multiple sources, including a rise in other options such as rideshare, bike share and micromobility, as well as overall economic growth. While individual riders switching from bus to TNC may experience benefits, this shift may result in negative externalities for those who rely on public

transit. Reduced bus (and other transit) service brought about by COVID-19 has exacerbated the challenges already faced by populations who rely on bus service the most—namely, people of color and low-income workers—through reduced route and trip options.

4 Low-income Ridership

Rideshare companies saw significant increases in low-income ridership and essential worker ridership during the pandemic.

In LA amid the pandemic, the uptake of on-demand ridership among workers earning less than \$40,000 was especially strong: in June ridership was around 140% of its pre-COVID-19 peak, according to data from Via. Lyft ran a demographic comparison of riders before COVID-19 and during the pandemic, and found riders during COVID-19 were more likely to be women, living with a disability, and of lower household income. Riders during COVID-19 are almost twice as likely to be from a racial or ethnic minority, and more than three times as likely to be an essential worker, as compared to riders before the pandemic.

OUTLOOK

Potential Outcomes

- Ridership among lower income groups increased during COVID. Growth in lower-income rideshare ridership is projected to increase, as transit agencies curtail service and jobs continue moving to the periphery.
- Car ownership is a critical indicator of Uber usage, especially among lower income workers reliant on off-peak transportation service.
- Bus ridership may continue to decline, resulting in patterns of increased rideshare reliance and cost burden on lower income households.

Future of Work

Key finding: As remote work becomes increasingly prevalent, shifting trends may highlight deep inequities in the U.S. economy as well as transportation systems and mobility. Changes to the way we work will have profound impacts on the shape and size of cities, affecting where people live, how they travel, and the distribution of land uses in metropolitan areas.

At the outset of the COVID-19 pandemic, rates of working from home in the U.S. doubled in only three weeks. While remote work has rapidly become routine for many employees, it has also exposed underlying inequities in how we travel, who has the option to work where, and what this means for cities developed around single-use central business districts. For Uber, these trends have profound implications, pointing to a potential decrease in center city-bound trips and business travel, potentially even lowering the overall number of trips taken on a daily basis. Emerging research suggests that remote or hybrid work will shape cities and communities in a range of ways, including patterns of more localized trips and workplaces, less demand for parking and roadway space in center cities, and a bifurcation in the commuting and mobility consumption habits of more highly educated, white collar workers and their blue collar counterparts.

The number of Americans working remotely doubled from 31% in mid-March to 62% in early April 2020. It is estimated that by 2025 there could be as many as 36.2 million Americans working remotely, an 87% increase of compared with pre-pandemic rates. (UpWork, 2020)

1 Class Bifurcation

Hybrid and remote work will become increasingly prevalent across professional industries and will highlight deep pre-existing inequities in U.S. and global economies.

While the potential transition to a work-from-home model has been exaggerated by some, the COVID-19 pandemic has furthered exposure of the convenience and financial practicality of shifting towards an environment of decentralized workplace options. While particularly pronounced in the US, this phenomenon is increasingly global in nature, especially in countries with advanced broadband infrastructure. Companies as diverse as Twitter, Zillow, and REI have already made remote work a permanent option for the vast majority of their employees. Others, including Amazon and Google, have taken a more gradual approach by reshaping their office assets for an indefinite hybrid scenario, stopping short of inviting most employees to work remotely in the long-term. The Pew Research found that prior to the pandemic, 7% of U.S. employees had a “flexible workplace,” the majority of whom were identified as “managers, white-collar professionals and highly paid.” The benefits consultancy Willis Towers Watson found this figure has skyrocketed to 57% working remotely as of March 2021, and projects that approximately 40% of all U.S. employees may remain off-site at least through the end of 2021.

While remote work has become prevalent particularly among workers in the knowledge economy, many working-class jobs do not allow for remote work, revealing deep inequities in our economy and transportation systems. According to the Pew Research Center, only 23% of workers without a four-year degree say that they can do their work from home, as opposed to 62% with a bachelor's degree of greater. Trip analysis suggests that in New York

City, 2020 ridership decreases in portions of Queens and the Bronx paled in comparison to affluent areas of Manhattan and Brooklyn. This supports some predictions that remote workplaces are likely to differ sharply by class, job type, and income. Mobility services, as a result, will need to adopt and cater to two increasingly divided demographics—those who have the option and the flexibility to work from home, at the office, or elsewhere as needed, and those who rely on increasingly budget-constrained transportation services to get to and from work.

2 Multi-Hub Office Locations

Future work environments may scatter into on multiple ‘hubs’ rather than fewer centralized operations, decreasing office demand in all top U.S. markets.

As companies transition to an increasingly remote work environment, it is projected that as their workers will spread out geographically and so will their office spaces. While this is not a new phenomenon and already reflects the situation in cities like Phoenix or Sao Paulo, it is likely to become more pronounced after the pandemic. Newfound workplace flexibility may push employees able to work remotely to the periphery of cities and beyond, exacerbating sprawl as long commutes become more infrequent and tolerable for many workers.

In place of centralized workplaces in congested downtown business districts, Cushman and Wakefield foresees a variety of flexible “hub” locations from which workers may conduct business both remotely and in-person. Alternative workplaces may eventually include one's home, local community or neighborhood hubs, on-demand event or gathering spaces, and “third places” in cities, in conjunction with more traditional but less-frequented locations such as a core office campus, or core urban

hub. The phenomenon of companies turning to a constellation of work environments rather than a centralized workplace is likely to emerge nationwide; however, this trend is projected to be most pronounced in markets with the greatest uptake of the work-from-home model, including Atlanta, GA, Charlotte, NC, and Austin, TX (Cushman & Wakefield). Internationally, remote work is expected to increase, but at a slower pace than in the United States.

“Most office activity will not move to homes or to the cloud. Instead, it is likely to be redistributed within and between cities, with a variety of new employment areas popping up and saving many people the trouble of simultaneous commuting to a central business district.”

- Dror Poleg, *New York Times*, 2021

3 New Live-Work Models

Cities across the United States are investing in live-work models and remote work incentives to attract mobile and highly-skilled residents.

As workers and their workplaces spread into the urban periphery and beyond, with many of them operating through a hybrid digital model, smaller cities with lower costs of living across the U.S. are offering incentives to workers who would live and conduct business there. Cities and regions investing in a variety of remote work infrastructure, grants, and in-kind gifts include Topeka, Kansas; Tulsa, Oklahoma; New Orleans, Louisiana; Bentonville, Arkansas; Ogden, Utah; Rocky Mount, North Carolina; and Rochester, New York. Remote working environments and incentive models like these could further accelerate a shift from large, dense, expensive cities to smaller and mid-sized cities with a lower cost of living.

“A lasting increase in working from home could have far-ranging consequences for the distribution of economic activity inside urban areas. One of the critical factors driving workers’ location choices is the need to commute between their job and their residence. Increasing the number of telecommuters makes this trade-off moot for a significant fraction of the workforce.”

- Delventhal et al, 2021

4 Evolving Urban Form

An environment of increased remote working is likely to have great effects on the scale and urban form of cities and entire regions, including increased demand for local retail and mixed-use amenities.

The new landscape of hybrid workplaces may pose serious implications for the future of mobility, particularly in urban areas. It is projected that employees in work-from-home occupations may opt for more arduous but less frequent commutes from residential locations which they view as more attractive or affordable. While time spent commuting is projected to fall, distances commuted may rise; and with fewer vehicles on the road, traffic congestion could ease at peak times, increasing average travel speeds (though empty roads could also induce further demand). In a long-term work from home scenario, far less parking may be required, potentially leading to a shift in urban form away from car parking and towards other uses which support an active, multi-modal public realm.

In addition to mobility and urban form, remote work is likely to significantly impact real estate, the scale of cities, and the characteristics of neighborhoods

and suburbs. In the US, these trends have been persistent over the past several decades, but are being exacerbated by the pandemic. As workers and their workplaces relocate to peripheral locations in place of centralized ones downtown, researchers project sizeable fluctuations in the real estate market, with prices decreasing overall, even offset for rising prices outside of core areas due to increased demand. Projections by Delventhal et al. featured in the *Journal of Urban Economics* suggest that in Los Angeles, for instance, the average price of housing may fall roughly 6%, due in large part to emerging trends in remote work.

At the same time, many single-use central business districts, including major centers like Manhattan and Downtown Los Angeles, are seeing the highest vacancy rates since the mid-1990s. According to Cushman & Wakefield, overall office vacancy rates in Manhattan are now 16.3%, up from 11.3% in Q1 2020. As a result of potentially long-lasting vacancies in both office and ground floor retail, many landlords are exploring potential office to residential conversions, a challenging prospect for large floorplate buildings that were purpose built as offices from the 1950s through the 1990s. Ultimately, the trend across the board points to a desire for increasing the overall percent of mixed use spaces, which can protect landlords against future shocks to the real estate sector and diversify their options for fit out.

OUTLOOK

Potential Outcomes

- The adoption of hybrid remote work models results in an overall decrease in the Rides business, including less business travel and airport travel for work.
- Fewer trips to and from traditional single-use Central Business Districts deconcentrate Uber’s business and make cities more polycentric over time.
- Single-use office districts (as well as malls and industrial parks) convert to mixed-use areas with a mix of residential, office, and entertainment, deemphasizing the hub-and-spoke model of trip making.
- There is an overall decrease in business travel in favor of remote communications and meetings.
- More space is consumed at the urban periphery as workers tolerate fewer, longer commutes.
- Companies create multi-hub office constellations with peripheral neighborhood locations closer to where people live.

Future of Retail & Logistics

Key Finding: COVID-19 accelerated already shifting trends in retail and goods movement. The uptake of e-commerce is projected to significantly impact traditional retail and freight over next decade.

COVID-19 sharply accelerated the rise of e-commerce and the decline of traditional brick-and-mortar retail. Due to public health concerns and state-mandated lockdowns, in-person shopping was heavily restricted during the spring and summer of 2020, bankrupting some of the oldest retailers in the United States, including Lord & Taylor, the oldest department store in the U.S., and the nation's very first clothing retailer, Brooks Brothers. As retailers and consumers emerge from the pandemic, COVID-19's effects on retail and goods movement will be brought into clearer focus, and may prompt some retailers and mall operators to convert newly-vacant spaces into logistics centers, a trend that was already underway before the pandemic. Malls and other outmoded retail assets will continue to undergo a process of reinvention as mixed-use destinations that combine housing, retail, and entertainment.

These trends reflect a broader shift from consumers traveling to purchase goods (at big box stores, grocery stores, and smaller retailers) to direct-to-consumer deliveries. While few expect for deliveries to maintain the same pace of growth seen during the heart of the pandemic, the overall trend has critical implications for how researchers and transportation planners understand future travel behaviors. As goods delivery increasingly supplants traditional retail purchases, how should cities be thinking about parking and loading needs, trip generation calculations, and overall travel demand? Will trips shift to more experiential forms of consumption or be consolidated into an increasingly efficient network of smaller freight vehicles.

"IBM's annual US Retail Index study suggests that COVID-19 has effectively accelerated the shift to e-commerce by five years, boosting some businesses while nearly bankrupting others."

- Mark Small, "Placemaking & Society: Retail: How essential is diversification to survival?" (2020)

1 Rising E-Commerce

E-commerce has skyrocketed during the pandemic, with more shoppers than ever before buying items online and planning to continue doing so for the foreseeable future, precipitating a severe decline in brick-and-mortar retail.

The pandemic has contributed to a surge in e-commerce, which experienced exponential growth through 2020, with a 32.4% increase from 2019 levels, while retail sales as a whole increased by only 3.4%. Mall-based retailers, meanwhile, saw a 256% earnings drop in the second quarter of 2020 (Bezuidenhout, 2020).

While the pandemic certainly accelerated trends away from brick-and-mortar retailers, their well-documented decline in advance of COVID-19 is beyond doubt. The number of retail leases signed or renewed across Manhattan in 2020 Q3 dropped 31% from a year prior, with rents down 13% along major shopping corridors (New York Times, 2020). This trend belies the fact that this marked the twelfth consecutive quarter of rent declines, indicating a trend the origins of which date back at least to 2016.

2 Big Box to Distribution Hub

The decline of brick and mortar retail and simultaneous rise of e-commerce prompted conversions of big box and retail stores into logistics and distribution centers, with other potential future uses including multi-family housing, experiential retail, and food markets.

The surge in e-commerce during the COVID-19 pandemic calls into question the nature and use of retail locations across the U.S. As shopping malls in particular struggle with declining foot traffic, operators are reconceptualizing the identities of these locations, with possible future uses including "multi-family [residential], education, experiential retail, food halls, healthcare, concert venues, and more" (Cushman & Wakefield, 2020).

In addition, the twin trends of declining brick-and-mortar shopping and the rise of e-commerce have prompted conversions of mall anchor retailers and big box stores into distribution and logistics centers. These facilities make ideal warehouses for several reasons. They are often proximate both to consumers and transportation links. These facilities are already outfitted with most of the infrastructure a logistics provider might need. Installing an additional loading dock is far faster than building a new complex from scratch, allowing operators to become more nimble, acquiring smaller and more precisely pinpointed sites as evidence shows where they are needed.

A repeated three-year study conducted by CBRE Econometric Advisors indicates that 59 such conversions were completed, proposed, or underway between 2017 and 2020, which is over 2.5 times as many as were found in the same study conducted only one year earlier. Roughly one third of conversion projects nationally have occurred across the five markets of Milwaukee, Cleveland, Chicago, Omaha, and Dallas/Fort Worth.

CBRE Research has found that \$1 billion in incremental e-commerce sales generates 1.25 million square feet of warehouse space demand.

The rise in demand for smaller warehouses located with greater precision is strongly tied to consumers' robust uptake of e-commerce to facilitate a range

of transactions, from purchasing clothing to cars to groceries and everything in between. Increasingly, products and even services are being ordered in advance and brought to the consumer rather than the other way around. As users expect an increasingly seamless experience of digital and physical retail, it is projected that providers able to offer increasingly narrow delivery windows will be best positioned post-pandemic. As competition increases among delivery operators aiming toward the utmost precision and predictability, so too will demand for smaller, decentralized logistics facilities, many of which may come to replace the shopping mall anchors and big box retailers of only a few years prior.

Average warehouse sizes have fallen by 9% since 2016 and trucks' average length of haul by 25% over ten years.

“What consumers are really looking for are precise deliveries and being able to receive their orders on specific dates and at exact times. Successful providers will be the ones that are able to slim that window down to 30, 20 or even 10-minute periods... Last mile properties will be smaller, process fewer parcels and serve less people, but there will be many more of them.”

- CBRE, “Urban Logistics: Delivering Closer to Consumers”

3 Experience Diversification

“Normal” in-person retail shopping is not expected to fully resume until at least 2023, if at all, and will likely be driven by experiential retail and services rather than dry goods.

As consumers increasingly opt to receive their goods via curbside pickup or delivery at home, pre-pandemic levels of retail shopping and foot traffic are not expected to fully return until 2023, should they materialize at all. To revitalize malls, operators are shifting away from simply showcasing and selling products and towards entertainment, experiences, and services to draw users inside. The malls of the future may be envisioned as thriving communities “where people will live, work, play, and eat,” and are projected to “offer people the opportunity to connect with others and feel the sense of community.”

OUTLOOK

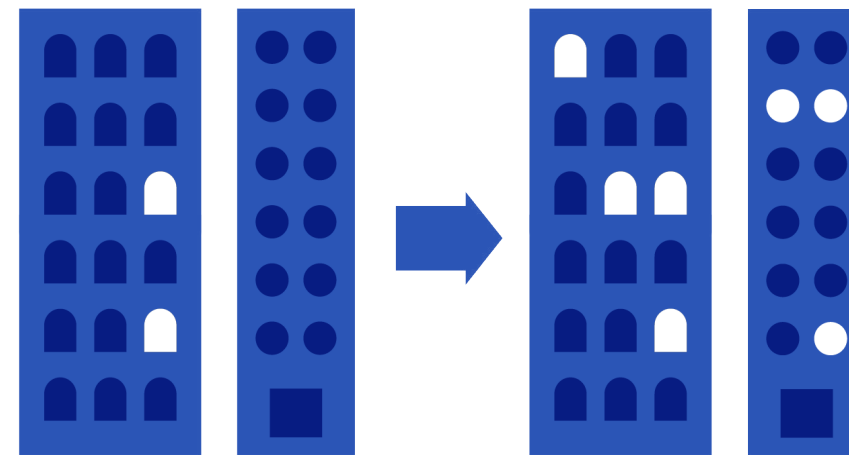
Potential Outcomes

- Rising e-commerce continues to increase demand for localized, on-demand delivery.
- Increasing diversification of retail assets and experiences, with a focus on entertainment, mixed-use, food and beverage drives a surge in late-night rides and weekend travel.
- The conversion of outmoded retail assets to new uses, including mixed-use communities and logistics and distribution centers, creates additional destinations in areas inaccessible to transit, creating new ridership patterns, but also surfacing latent inequities.
- There is an overall decline in roadway and parking demand near major retail destinations as on-demand delivery commands a greater share of the market.
- Trip generation rates are revised to focus on trips received (direct to consumer) rather than trips generated.



E-commerce is now 13.6% of total retail sales in the US.

Q1 2021 saw 39.1% growth in the e-commerce over Q1 2020. In the UK and Latin America, e-commerce reached over 30% of total retail sales.



16.4 % of office space in the US is vacant (Q1 2021).

Up from 9% in Q4 2019 and 13% in Q1 2020. (Source: Statista)

Regional Development

Key Finding: American suburbs are growing. The pandemic accelerated this growth in some regions, as residents of densely populated and expensive cities fled to nearby suburbs. As work and commuting patterns shift, Millennials age, and more municipalities adopt 15-minute city paradigms, the landscape of cities and regions will emphasize mixed-use environments in both suburbs and the urban core.

In keeping with trends that predate the pandemic and policies that favor suburbanization, the nation's largest and densest cities have seen an exodus of residents since the start of COVID-19, with home sales rising in their outlying suburbs over the past year. This trend is unfolding across the U.S. but most dramatically outside of more expensive and highly populated cities, namely New York, Los Angeles, and San Francisco. In some regions, particularly in the Midwest, urban home values have outperformed those in the suburbs. This highlights the importance of understanding regional differences in demographic change and its impacts on mobility. Overall, urban areas have generally kept pace with suburbs along key metrics, including in real estate value growth, Zillow web traffic, and sales volume.

While the pandemic has reshaped the needs and lifestyles of many Americans, it has also accelerated existing trends in suburbs. Large suburbs have grown in their share of the nation's population over recent decades, from a fifth of the population in 1970 to one fourth of the U.S. population today. Historically, homes were more affordable in city cores than in suburbs. This relationship flipped starting around 2000, when suburbs in many places became more affordable than city cores. After being outpaced by urban population growth between 2010 and 2016, suburbs began to see more population growth than cities starting in 2017.

Over the coming decade, the rise of remote and hybrid work and the aging of Millennials may accelerate growth in the suburbs. A single-family home buying wave is expected in the next decade, driven by Millennials—now the largest generation group in the U.S., comprising 22% of the population

(Brookings, 2020). Experts project a large increase in the demand for single-family homes, as more Millennials reach the current median home-buying age of 33 (McCarthy, 2020).

In cities, a continuation of planning trends which predate COVID-19 may support a transition to more neighborhood-centric approaches to development that encourage shorter trips by foot or bike. More homebuyers may be seeking 15-minute neighborhoods, with mixed uses and convenient, bikeable and walkable amenities, rather than car dependent subdivisions.

Population growth and demographic shifts in the suburbs have the potential to change the geography of rideshare services, which historically have seen their highest volumes in densely populated cities. In urban areas, a transition to 15-minute city planning paradigms could reduce the need for longer trips (i.e. to a central business district) for work, services, shopping, and more. In some cases, these shorter trips may be replaced by walking, biking, or use of shared mobility (e-scooter or bike share). During the pandemic, shifts to micromobility have already caused many cities to invest in updates to infrastructure to encourage active mobility. These shorter trips may become a more important part of Uber's work in cities, while population shifts to the suburbs present both opportunities and challenges for the current rideshare model.

While further research is needed to understand shifts in travel mode and preferences post-COVID-19, research suggests that, since the start of the pandemic, people are taking shorter and more frequent trips, often via foot or bike for recreational purposes. Miles driven by car decreased in the early months of the pandemic, and public transit ridership remained 65% less utilized by July 2020 as compared to before the pandemic (USA Facts).

Large suburbs made about up a fifth of the nation's population in 1970, and a fourth of it today.

“The population of the large suburban counties has increased by 25% in the new century, outpacing the nation's overall population growth (16%).”

- Richard Fry, “Comparing Urban Core, Suburban Counties in the U.S.”

1 Post-COVID suburban growth
COVID is driving an exodus to the suburbs from dense cities, but urban residential markets are keeping pace in many regions.

In 2020, suburban homes sold faster than urban homes, but urban areas kept pace with suburban areas in terms of home value, sales volume, and Zillow web traffic. There are regional differences in real estate trends since COVID: in much of the Midwest, urban home values outperformed suburbs. However, in the most expensive markets (New York and San Francisco, namely), demand in the suburbs exceeded urban centers. The exodus from dense cities since the start of the pandemic is most dramatic outside of New York, Los Angeles, and San Francisco--more expensive and highly populated cities.

Large suburban areas have been growing as a share of the nation's population, while rural areas have lost ground and cities have remained stagnant. Large suburbs made up a fifth of the nation's population in 1970 and comprise a fourth of it today (Adams, 2020). The faster declines in population in rural areas suggest the growth of the suburbs is not driven solely by a retreat from cities.

From 2010 to 2016, populations grew more rapidly in cities than suburbs, but this trend reversed starting in 2017, when suburbs began to outpace cities (McCarthy, 2020). The exodus from some cities amid the COVID-19 pandemic, paired with the flip of affordability between urban and suburban housing markets, suggests to many experts that these trends will continue.

2 Suburbs are diversifying

As American suburbs grow, their demographics are becoming more ethnically, racially, and economically diverse.

Populations in suburbs are growing, and they are becoming more diverse more quickly than urban areas. The population of White residents in suburbs decreased from 77% in 2000 to 66% in 2018 (Adams, 2020). Latino- and Asian-Americans have almost doubled their shares of the population in suburbs. The population in poverty has increased by 55% since 2000, compared to a 23% increase in central cities (Fry, 2020).

Suburbs – which have historically been more conservative – have become more politically mixed—with many districts in dead heats in political races. Populations of older adults (65 and above) and younger adults (under age 25) are also growing in suburbs, while adults aged 25-44 are increasingly residing in urban cores (Fry, 2020).

As suburbs grow and diversify, their character is expected to change to accommodate the needs of younger adults, aging residents, and mixed-income communities. Many places are advocating for zoning changes to allow for more rentals and missing middle housing in suburbs, as well as more multi-family options for younger adults and older adults looking to age in place.

“20 years ago, suburban houses were significantly more expensive—an average of \$319,000 versus \$269,000 in core cities, a relationship which has been flipped.”

- Robert Steuteville, “How Suburbs Will Change After COVID”

3 Millennial homeownership

Increased demand for single-family homes is expected in the next decade, driven by Millennials entering home ownership.

Millennials, now the largest age cohort in the U.S., are buying homes later, with the median age of first-time home buyers at 33 years as of 2019. 70% of millennials are under the age of 33, leading many to project a large wave of new home buyers entering the market in the coming years. This is likely to result in a boost in demand for single-family homes in the next decade (McCarthy, 2020).

While much existing suburban housing stock is single family, developers are increasingly developing new models of mixed use and multi-family housing that challenge the conventional design approaches to suburban areas. New developments like Cul-de-Sac in Tempe, Arizona, are testing denser models of suburban development, which could create new paradigms for car-free living and mobility-oriented development in the future.

4 Mobility-oriented development

As development opportunities shift away from places easily accessible from transit, developers have begun to expand their playbook of mobility management strategies.

In some markets, especially more expensive housing markets like San Francisco and Washington DC, developers have begun shifting from the traditional notion of Transit-oriented development towards Mobility-oriented development. In large housing developments like San Francisco’s Park Merced, developers have decided to offer residents amenity packages via Clipper Card along with an allowance for shared rides on Uber and Lyft. Since the cost of building parking for residents in these outlying areas can be significant, more developers are pursuing these types of partnerships to build more housing, while enabling residents to take advantage of a wider array of options.

Partnerships like these remain relatively rare, but have significant implications for mobility and development. What if more housing products begin to account for mobility services rather than building off-street parking? What is the value of those services and who can manage them? How could these amenity packages ultimately interface with other services run by employers, like TransitCheck?

Working more closely with developers to understand the costs and benefits of these kinds of mobility packages can help inform the future trajectory of development beyond the transit shed, while enabling greater densities in places that have traditionally been transit poor.

OUTLOOK

Potential Outcomes

- The suburbanization of poverty results in an increase in transit-dependent populations without access to a car in the suburbs. Rideshare continues to fill gaps poorly served by transit.
- Growing millennial homeownership presents an opportunity to create models for car-free or car-light communities, catering to populations who are already Uber users.
- Developers experiment with car-free developments catering to new generations disinterested in the burdens of car ownership.
- An increasing number of people experience the city in a polycentric way, moving through and between outlying areas of the city, rather than moving back and forth between the core.
- More developers opt to pursue amenity and mobility packages instead of building parking for residents beyond the transit shed.

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