



Shaping Post-Covid Mobility in Cities

Summary and Conclusions



Shaping Post-Covid Mobility in Cities

Summary and Conclusions



The International Transport Forum

The International Transport Forum is an intergovernmental organisation with 64 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. ITF is the only global body that covers all transport modes. The ITF is politically autonomous and administratively integrated with the OECD.

The ITF works for transport policies that improve peoples' lives. Our mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of transport policy.

The ITF organises global dialogue for better transport. We act as a platform for discussion and pre-negotiation of policy issues across all transport modes. We analyse trends, share knowledge and promote exchange among transport decision makers and civil society. The ITF's Annual Summit is the world's largest gathering of transport ministers and the leading global platform for dialogue on transport policy.

The Members of the Forum are: Albania, Armenia, Argentina, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Cambodia, Canada, Chile, China (People's Republic of), Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Republic of Moldova, Mongolia, Montenegro, Morocco, the Netherlands, New Zealand, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Tunisia, Türkiye, Ukraine, the United Arab Emirates, the United Kingdom, the United States and Uzbekistan.

International Transport Forum

2 rue André Pascal

F-75775 Paris Cedex 16

contact@itf-oecd.org

www.itf-oecd.org

ITF Roundtables

ITF Roundtables bring together international experts to discuss specific topics on economic and regulatory aspects of transport policies in ITF member countries. Findings of ITF Roundtables are published in a Summary and Conclusions paper. Any findings, interpretations and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the International Transport Forum or the OECD. Neither the OECD, the ITF nor the authors guarantee the accuracy of any data or other information contained in this publication and accept no responsibility whatsoever for any consequence of their use. This document and any maps included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries or to the name of any territory, city or area.

Cite this work as: ITF (2023), *Shaping Post-Covid Mobility in Cities: Summary and Conclusions*, ITF Roundtable Reports, No. 190, OECD Publishing, Paris.

Acknowledgements

This Roundtable Report builds on expert discussions during an ITF Roundtable, “Shaping Post-Covid Mobility in Cities”, held in Paris and virtually on 8-10 June 2022. Rhona Glazer-Munck (Department for Transport, United Kingdom) chaired the Roundtable.

At the ITF, Malithi Fernando and María Santos Alfageme wrote the report. Malithi Fernando also co-ordinated the overall project, while David Prater managed the editorial process. Diego Botero and Nicolas Caros provided support on data visualisations and graphs. Philippe Crist and Jagoda Egeland provided feedback on the draft report. Dominique Bouquet and Layla Khalaf provided administrative support to the Roundtable. Shaoni Purkait (ITF consultant) provided support on background research.

The authors would like to thank Agustin Beccar (Ciudad de Buenos Aires), Marije Hamersma (KiM Netherlands Institute for Transport Policy Analysis), Aldana Hofman (Ciudad de Buenos Aires), Anne Laure Le Merre (Union Internationale des Transports Publics), Greg Marsden (University of Leeds), Emmanuel Mogaji (University of Greenwich), Alexandre Santacreu (European Metropolitan Transport Authorities) and Owen Waygood (Polytechnique Montréal) for their valuable comments on the draft report.

The ITF would like to thank Rhona Glazer-Munck for chairing the Roundtable. Thanks also to Jillian Anable (University of Leeds), Emmanuel Mogaji (University of Greenwich), Sheilah Napalang (Department of Transportation, Philippines), Laurent Tridemy (Michelin) and Jeremy Yap (Land Transport Authority, Singapore) for their presentations during the Roundtable. Annex A lists the names and affiliations of the 40 Roundtable participants from 21 countries.

This Roundtable Report is part of the ITF’s core Programme of Work for 2022-23, co-ordinated by Jagoda Egeland, and has been approved by the ITF’s Transport Research Committee.

Table of contents

Executive summary	6
Introduction	8
How urban travel behaviour changed during the pandemic.....	9
People adjusted to travel restrictions by travelling in new ways.....	9
Policies and personal factors shaped pandemic travel behaviour.....	10
Policy responses to the pandemic reshaped work practices	11
Micromobility and active mobility received a new impetus	16
The pandemic’s effects on car use and ownership remain unclear	17
The outlook for teleworking and its impact on cities.....	18
Teleworking’s effects on transport are still highly uncertain.....	18
People are relocating but primarily within major urban areas.....	19
Teleworking’s effects on transport provision.....	21
How policy makers can approach urban transport planning in a post-pandemic world.....	22
Adopt a “decide and provide” approach reinforced by data and stakeholder support.....	22
Focus on increasing accessibility over increasing mobility	25
Reorient the use of city space around people not cars	25
Underpin recovery with environmental and health considerations.....	28
Managing post-pandemic integrated transport systems	29
Cater for diverse travel purposes and travellers, not one archetype.....	29
Decentralise and diversify mass and shared transport services	30
Win back public transport riders and target new users.....	33
Build on the momentum for active travel and micromobility	35
Collect more data on active modes and micromobility	37
Multi-level governance for a co-ordinated pandemic recovery.....	40
Empower city authorities to transform mobility.....	40
Align public transport recovery in cities with broader national policy goals.....	41
References	44
Annex. List of Roundtable participants	57

Figures

Figure 1. Mobility patterns in Colombia, Germany, Ghana, India and the United States, 2020-22	10
Figure 2. Public transport usage in London, July 2020 to July 2022.....	15
Figure 3. Decrease in household car ownership in the United Kingdom, June 2020 to July 2021.....	17
Figure 4. Changes in house prices in Budapest and Lisbon, 2019 to 2021.....	20
Figure 5. Spatial coverage of Mexico City’s formal and informal public transport networks, 2022.....	32
Figure 6. An example of a cycle lane in Buenos Aires installed during the pandemic.....	36
Figure 7. A bike counter in Paris tracking cyclists using dedicated infrastructure	38

Boxes

Box 1. Lessons from London’s low-traffic neighbourhoods	24
Box 2. Converting on-street parking to outdoor terraces in Paris.....	27
Box 3. Germany’s 2022 experiment with integrated public transport tickets	42

Executive summary

What we did

The Covid-19 pandemic has changed how people live and move, especially in urban environments. As many cities transition towards living with the virus, this presents challenges and opportunities to create more sustainable, resilient and equitable transport systems. This report explores how urban mobility changed during the pandemic, focusing on changes in how people work. Based on a review of international best practices, the report provides recommendations for better urban mobility in a post-Covid world.

What we found

Travel behaviour in cities is not likely to reach a “new normal” in the wake of Covid-19. Travel habits remain uncertain, with several other crises coinciding with recovery from the pandemic. Policy makers, therefore, face a challenging decision-making environment. However, the Covid-19 experience has also proven that they can introduce sweeping changes in the face of new challenges. This offers hope for a transformation of urban environments into cities that are more sustainable and liveable.

Many governments imposed strict lockdowns and physical distancing at the beginning of the pandemic. These policies had a profound impact on mobility in cities. With very low demand and new health protocols, some cities reduced public transport provision. Authorities also had to pivot how they delivered services to make essential trips possible.

Many cities addressed the connectivity challenge by promoting active transport modes and micromobility. They invested in pop-up infrastructure, widened footpaths, and partially closed streets to traffic to encourage walking and cycling. Local authorities with comprehensive active mobility plans already in place were able to progress most efficiently in rolling out infrastructure during the pandemic.

Working from home became a global experiment, with office-based employees teleworking at unprecedented levels. While these levels are unlikely to continue in the post-pandemic world, hybrid working arrangements for office workers have become common. Fewer trips to the office are often perceived to have a positive effect, reducing environmental pollution and strains on the transport network.

However, less commuting can lead to more non-work-related travel. Freedom to work from home can also lead city-dwellers to relocate to suburbs, prolonging occasional commutes and potentially increasing car dependence. In many cities, car traffic has returned to pre-pandemic levels and is rising further. The teleworking patterns emerging in the future could be a deciding factor in whether people adopt more car-centric lifestyles or not. More research is needed here, as is attention from policy makers.

Not everyone had the luxury of teleworking during the Covid-19 pandemic. Essential workers in health care, service and other industries relied on formal and informal public transport to continue working during the pandemic. Making these services safe to use was vital to keeping cities functioning.

The pandemic highlighted the importance of public transport as a backbone of the transport network. Yet it also demonstrated its vulnerability to demand fluctuations. Less commuting has meant cuts to public transport provision. Demand in many cities has recovered, but its pattern is now different, with less pronounced peak-hour travel. Cities with significant capacity issues have welcomed this trend. At the same time, lower demand has meant severe revenue losses for public transport operators in other contexts.

What we recommend

Replace “predict and provide” transport planning with a “decide and provide” approach

Policy makers should abandon the “predict and provide” approach, which prioritises enabling forecasted demand by reducing traffic bottlenecks. To put urban mobility on a path towards sustainability, they should instead implement a vision-led “decide and provide” approach, where policy leads rather than responds to change. This will help align Covid-19 recovery with other strategic goals, such as mitigating climate change, addressing cost-of-living challenges and delivering transport services in an efficient and economically viable manner. A robust process for comprehensive stakeholder consultation will ensure the approach is effective.

Use Covid-19 recovery to improve the physical and virtual accessibility of services and opportunities

Pandemic-induced changes in habits made the value of physical and virtual accessibility more salient. Public support for accessibility improvements will likely be greater during recovery from Covid-19, making it possible to implement previously contentious policies. Virtual access to work, medical services, social interaction and other opportunities should be offered where possible. Yet not everything can happen online, nor do all people have access to the required technology or possess the necessary competencies.

Accelerate the reallocation of city space from cars to people

The pandemic triggered a host of changes in the use of urban space that enabled socially distanced travel and encouraged walking, cycling and other forms of active mobility. City authorities should build on this momentum to expand dedicated infrastructure for active mobility, introduce traffic-calmed areas and enable the sharing of road space.

Decentralise and diversify transport services to cater for varying travel purposes and users

Traditionally dominant peak-hour commutes of office employees into central business districts fell significantly in volume during the pandemic. This development highlighted the importance of other trip types, such as atypical commutes, trips for care purposes and leisure travel. Transport systems should plan for everywhere-to-everywhere travel networks – not just radial, peak hour-based systems – to serve more diverse trip types and travellers better. Achieving this requires a multi-modal transport model, combining shared mobility and demand-responsive transport, micromobility and active travel with public transport.

Empower local authorities with adequate funds and decision-making power to address post-pandemic transport challenges

Local governments responding to the Covid-19 pandemic faced limited funding and a lack of power to make decisions to address local transport issues. National governments can address this by providing local authorities with sufficient funds and authority to make necessary investments to improve their transport networks. The long-term visibility of available budgets is vital for robust, ambitious policy action at the local level. At the same time, local authorities’ financial contributions to such projects help create accountability and ensure value for money.

Introduction

Much of the dialogue on pandemic recovery focuses on finding a “new normal”. The desire to find and define a new normal is an understandable approach. It suggests a stable policy-making environment and decision making with a sense of certainty. Transport policy-making has never occurred under deterministic conditions. However, the pandemic recovery period brings a level of unpredictability not experienced in the recent past.

At the time of writing in late 2022, recovery coincides with war, supply chain disruptions, and a food and energy crisis leading to high inflation. In a period when social protection systems are suffering stress from three years of a pandemic, governments are facing an exceedingly challenging policy-making environment.

In this context, there is no reliable way of predicting future travel habits. Trip rates may be reaching pre-pandemic levels, but where people are going and when and how they are getting there will continue to vary. Travel habits will evolve based on the effects of external crises, personal needs, means, beliefs and habits. Given this uncertainty, now is an opportune time to shift from traditional “predict and provide” methods of transport planning to a “decide and provide” approach: deciding on a collectively desired future and creating policies that support it (ITF, 2021a).

This report adopts such an approach, identifying how policy makers can capitalise on positive outcomes and take stock of transport-related lessons from Covid-19 to create this new future. It begins by examining how urban travel behaviour changed during the pandemic. Then follows a chapter speculating on the future role of teleworking and its impact on cities. Detailed analysis of changes in other trip types (e.g. care trips, shopping trips due to e-commerce, and leisure trips) is beyond this report’s scope but would make for valuable future research.

The remaining three chapters provide policy makers and other stakeholders in urban mobility with recommendations for action based on best practices and lessons from around the world. The actions outlined in this report require complementary measures whose applicability will vary based on geographical and socio-demographic contexts. There are no one-size-fits-all policy measures when it comes to shaping post-Covid mobility.

While local authorities shape transport systems and travel behaviour in this transitional phase, they also have the challenge of making transport systems more sustainable and resilient. They are working to reduce energy use, emissions, and the inequalities exacerbated by the pandemic. Perhaps, eventually, this will be the “new normal”. However, it will only emerge when policy makers have grasped the opportunity to shape recovery.

How urban travel behaviour changed during the pandemic

The Covid-19 pandemic significantly affected the travel patterns of urban residents. People in cities worldwide changed where, when and how they moved. Strict lockdowns marked the first phase of the pandemic, with many governments reacting quickly to reduce the movement of citizens to a strict minimum. Public transport use and road traffic dropped to levels never before seen. Even walking around neighbourhoods was actively limited in some communities, while others voluntarily chose to remain at home to reduce the virus' spread. With each new wave of infections, restrictions were eased and reintroduced, with travel resuming and subsiding in a similar wave-like pattern.

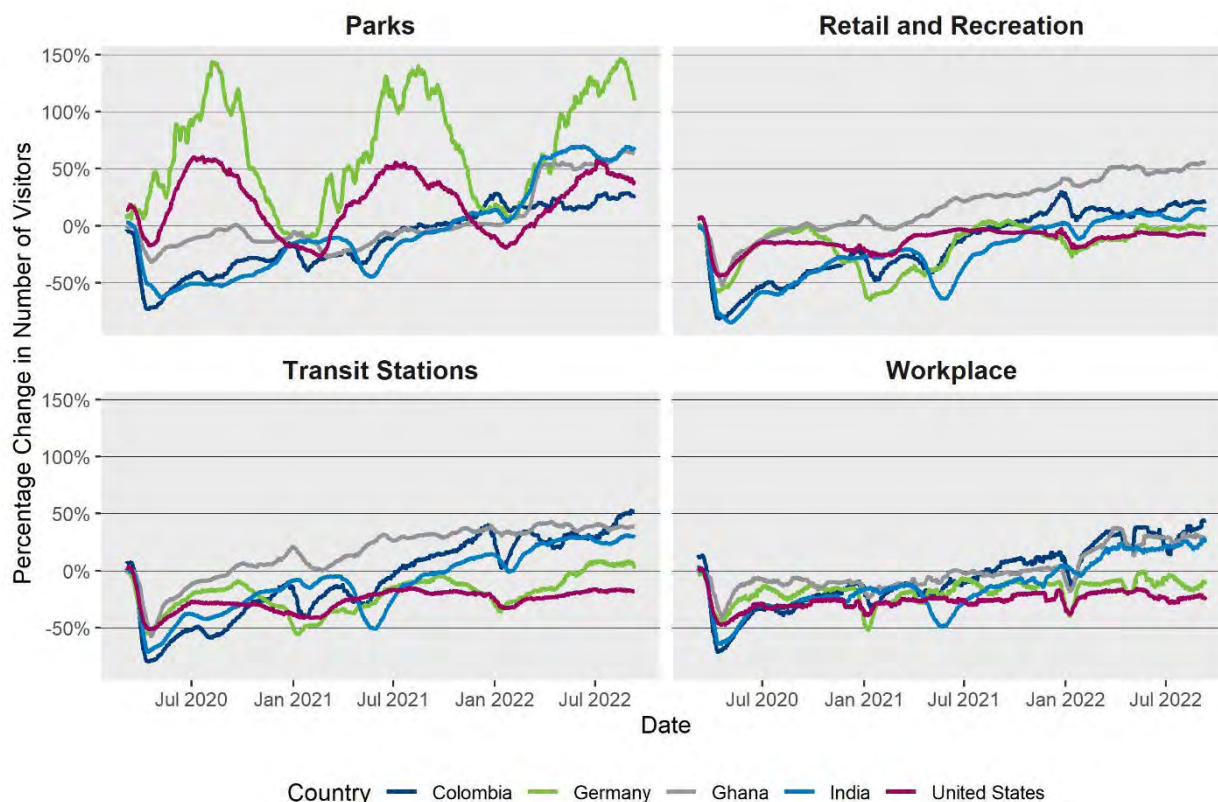
People adjusted to travel restrictions by travelling in new ways

Shifts in travel behaviour varied from country to country and between cities. In some cases, people began replacing physical destinations with virtual ones. In the United Kingdom, the frequency and timing of trips also changed, according to a panel study (Anable et al., 2022; Anable and Marsden, 2022). The Netherlands saw a 55% decline in physical trips and a 68% drop in distances travelled (de Haas et al., 2020). In Bangladesh, while Covid-19 caused significant changes in mode preference as people shifted to digital means of “travel” and away from formal and informal public transport, trip frequencies remained similar (Anwari et al., 2021). Walking and cycling gained popularity in many cities, including Brussels, Beijing, Jakarta, Mexico City and Paris (Buehler and Pucher, 2022; ITDP, 2021). Meanwhile, walking and cycling in Pakistan remained less attractive due to lack of safe infrastructure and bicycle access (Lee et al., 2021).

In a September 2022 press conference, World Health Organization Director-General Tedros Adhanom Ghebreyesus stated that “the end is in sight” but warned: “Being able to see the end does not mean we are at the end” (WHO, 2022). Many governments are now shifting from heightened crisis management to “living with the virus”. This shift means, among other things, that travel is resuming. However, travel patterns continue to vary widely between countries. During the pandemic, people moved through public spaces (e.g. parks, retail and recreation facilities, public transport stations and workplaces) in different ways (see Figure 1). Analysing these patterns over time reveals the residual effects of changes in travel behaviour that first emerged at the beginning of the pandemic.

Surveys and data collected by transport departments provide a snapshot of where trends may be heading. By February 2022, overall trip rates were close to pre-pandemic levels in the United States. But very short trips of less than one mile (1.6 kilometres) had become more common, while trips longer than a mile had declined (US Bureau of Transportation Statistics, 2022). By May 2022, travel patterns also continued to revert to the pre-pandemic baseline in New Zealand. According to a nationally representative survey, 48% of people (compared to 23% in September 2021) were making work trips in a given week, getting closer to the pre-pandemic rate of 57%. Trips to places of education were up from 2% in September 2021 to 16%, approaching the pre-pandemic share of 18% (Waka Kotahi New Zealand Transport Agency, 2022c). In the United Kingdom, by October 2022, weekly car traffic levels were, on average, at 96% of pre-pandemic levels, while the London Underground was running at 79%, and buses across the country were performing at 89% of pre-pandemic passenger volumes (DfT, 2022b).

Figure 1. Mobility patterns in Colombia, Germany, Ghana, India and the United States, 2020-22



Note: The four graphs in this figure depict the percent change in number of visitors to places of Retail and Recreation, Parks, Workplaces, and Transit Stations. While the relative magnitudes should not be compared between countries, the difference in patterns over time for each country shows the variation in pandemic experiences since 2020 and the residual effects that remain more than two years later.

Source: ITF using Google Mobility Reports (Google LLC, 2022).

Policies and personal factors shaped pandemic travel behaviour

There are many determinants of travel behaviour. The built environment, the transport options available and their cost in terms of finances and time, personal resources and circumstances, perception of abilities, attitudes and preferences, subjective norms, and habits all contribute to individual travel decisions (Barajas, 2021; Heinen and Chatterjee, 2015; Schneider, 2013). Government policies to change travel behaviour typically influence some of these factors to render the desired behaviour change. For example, carbon tax schemes increase the cost of using fossil fuels, and supporting cycling training helps people feel confident in their abilities.

During the pandemic, government restrictions on travel were significantly more drastic than previously seen travel behaviour policies—especially during the first phase of the pandemic. Personal resources and circumstances, especially health or economic concerns, also took on increased importance for many during the pandemic. Lastly, habits were broken across societies. Typically, the most opportune time to influence behaviour is during transitional periods, such as moving, starting a new job, or having a child, when existing habits are broken (Alta Planning and Design and Behavioural Insights Team, 2018). The pandemic

has rendered a global opportunity to influence habits at a time when entire societies are rethinking and reforming theirs.

The pandemic demonstrated the power of policy in creating sweeping travel behaviour changes. While such drastic measures are unlikely to be seen outside an emergency context, the policy tools exist to invoke remarkable societal shifts. Understanding the strong influence of personal factors on travel and decisions during the pandemic also shows how important it is that future policies account for diverse personal circumstances and resources. People’s willingness and ability to follow government policies are framed, in part, by personal factors.

Personal factors such as household health risks, trust in the government, and socio-economic circumstances strongly influenced decisions. At the same time, trip cost lost some of its prominence, especially at the beginning of the pandemic. While cost and convenience traditionally play a crucial role in travellers' choice of modes, reducing the risk of infection became one of the top reasons behind travel in major urban centres, even more than travel time for both private and business trips (Abdullah et al., 2020). In the United Kingdom, those with health risks or family members at risk were among the first to start shopping online during the pandemic (Anable and Marsden, 2022). A Scottish survey found a link between compliance with Covid-19 regulations and citizens’ trust in their government (Downey et al., 2021). In contrast, others argued that the ability to prioritise health risks was a luxury. A survey of commuters in India showed that 75% felt unsafe using public modes of transport, but 51% continued to use the same mode, and only 5% shifted from public to private modes (Pawar et al., 2020). Even those that switched temporarily to private modes in Bangladesh due to health risks or the availability of public transport are expected to return to shared and public transport due to affordability (Jamal et al., 2022).

Policy responses to the pandemic reshaped work practices

Under government-mandated lockdowns at the start of the pandemic, except for essential workers, employees worked from home if their job allowed it. Employees who could not work from home and could not work had to stay at home and face the economic consequences. While many countries launched an unprecedented social protection response to Covid-19 in its initial stages, either through direct payments to employees or business assistance, the response was highly uneven across countries. In most countries, it was not long-lived or adequate to maintain living standards (ILO, 2022). The varying economic impact on those who could and could not work suggests that transport policy makers must ensure recovery focuses on affordable access to help people regain their footing in the coming years. The shift in who travelled during the pandemic also highlights the need to consider how transport services serve the needs of people beyond regular office-based commuters.

Teleworking is not an option for most workers. Globally, around 20% of jobs are suited to teleworking, but the percentage is much lower in low-income countries (Garrote Sanchez et al., 2020). In France, a survey at the start of the pandemic found that 33% of employees worked from home. A further 40% were no longer working, while 27% continued to work outside the home (Colard and Ni, 2020). Across Europe, less than 40% of employees teleworked during the lockdowns (ILO, 2022). In countries such as Nigeria, where the informal sector accounts for approximately 65% of the economy, working from home was not an option for the majority (Mogaji, 2020). Even within countries with comparatively high rates of teleworking during the pandemic (e.g. the United Kingdom, where the figure was 47%), there was a significant regional correlation with the ability to telework, reflecting the dominant industries and sociodemographic characteristics of an area (Anable et al., 2022; OECD, 2021).

The ability to telework is highly correlated with higher education and income levels. Lower-income earners are concentrated in occupations in which it is more difficult to telework, and disproportionately represented in sectors hardest hit by the pandemic, including the hospitality, service and retail industries (Bonacini et al., 2021; Brussevich et al., 2020; de Palma and Vosough, 2021; Garrote Sanchez et al., 2020). In the United States, 64% of businesses in the quartile of industries requiring the highest levels of education had workers that switched to teleworking at least part-time during the pandemic. In the least educated quartile, only 36% of firms had workers working remotely (Bartik et al., 2020). In Chile, over three-quarters of low-income workers had to go out and work during the pandemic, while 80% of high-income workers could telework (Astroza et al., 2020).

The divide between those who could and could not telework increased economic inequality during the pandemic, as those able to work from home have been somewhat “economically insulated” from the crisis (EC, 2020; Garrote Sanchez et al., 2020). World Bank data shows that higher-income earners have nearly regained the slight 2.6% income loss felt during the pandemic, while the lowest-income earners earn almost 7% less and have not recovered their losses (Sidik, 2022). A study of the Italian context found that an increase in teleworking feasibility tends to financially benefit male, older, highly educated and high-earning employees who work in jobs that are more conducive to remote work, contributing to a rise in income inequality (Bonacini et al., 2021). In South Africa, the difference between genders was not statistically significant, but working from home favoured workers of higher socio-economic status, which is correlated with being non-African (Nwosu et al., 2022). These insights align with an International Monetary Fund analysis of endemics in the last century. It found that endemics have raised inequality and worsened employment outcomes for those with a basic education, while having a negligible impact on highly educated individuals. Covid-19 is expected to have a similar effect (Fuceri et al., 2020).

While unlikely to be sustained at pandemic levels, there is an appetite for continued teleworking and hybrid arrangements, although this is limited by infrastructure, industry and office culture. A study of urban workers in Argentina, Australia, Brazil, Chile, Colombia, Ecuador, Peru and South Africa found growing support for teleworking from employers and employees. Teleworking resulted in the same or higher productivity levels (Balbontin et al., 2021). Knowledge workers prefer a hybrid, flexible working format both in terms of where and when they work, according to a 2022 survey of over 10 000 knowledge workers in Australia, France, Germany, Japan, the United Kingdom and the United States (Future Forum, 2022). In addition to having a job compatible with telework, trust, work culture, and the infrastructure available are major factors in whether people can telework (EU, 2020; Mogaji, 2022b). In Nigeria, for example, the cost of electricity, the lack of at-home computers, and the quality of broadband are the main inhibitors to unlocking the teleworking potential (Mogaji, 2022a; Mogaji et al., 2022).

Whether teleworking yields sustainability benefits (e.g. potential traffic and emission reductions) will depend on policy action. Where flexible working continues, travel patterns reflect the change in habits. Mondays and Fridays see lower traffic. Times traditionally considered off-peak now experience higher trip volumes (Yap, 2022). This is not only due to shifted start/end times but also the need for additional trips such as running errands, dropping children off at school or leisure activities in the middle of the day. Some countries, such as the Netherlands and Singapore, are stimulating working from home because of its contribution to accessibility and sustainability. How these policies are integrated with transport and urban planning will determine whether teleworking has a positive impact on sustainability and travel-demand reduction. During the pandemic, teleworking became associated with immediate environmental benefits from lower air pollution and greenhouse gas emissions (Badia et al., 2021). In the long run, there can be a rebound effect due to increases in non-work travel, and residential relocation leading to car dependence reversing or negating some of the benefits (Adobati and Debernardi, 2022; Viana Cerqueira et al., 2020). The next chapter delves into the outlook on teleworking and its impact on cities in more detail.

The pandemic highlighted public transport's value and vulnerabilities

The dramatic drop in public transport usage was perhaps the most visible impact on urban passenger travel during the Covid-19 pandemic. Suspending some or all public transport was a common response across cities. As restrictions on the movement of people have eased, government messaging, sanitary measures, and lasting impacts on services and fares have all contributed to whether and to what extent public transport has recovered and will continue to recover.

In some cities, officials strongly advised residents to stop using public transport because of its health dangers. However, many essential workers had no alternatives to turn to. Improving the safety of riders and essential transport workers was crucial for the survival of cities during the pandemic. Such initiatives included off-board fare collection and back-door boarding, barriers, spacing, enhanced cleaning, personal protective equipment for staff, and mask mandates (UITP, 2021a, 2021b, 2020).

Cities with high service levels and visibly implemented biological safety measures maintained the highest patronage compared to pre-pandemic norms. The perceived risk of infection on public transport correlated with public transport usage in a study of 25 major global cities. Cities that introduced mandatory masking, physical distancing and frequent disinfection, among other measures, early in the pandemic helped manage the fear of infection among passengers and performed best (McKinsey and Company, 2021).

Transport authorities worked under difficult financial circumstances to adapt the level of transport supply to manage capacity and liaise with the public to communicate better and improve services. In some cities, including Barcelona, services were maintained at 100% even as demand was down. Other cities, such as Helsinki, prioritised some modes, reducing tram service by 60% but maintaining buses at 90%. Authorities used a range of digital tools to communicate information, set up hotlines, and adapted ticketing to include contactless options or, in some cases, temporarily suspended the need for validation (UITP, 2021a).

To help essential workers get to their workplaces, some transport authorities and operators redeployed radial services and other lesser-used routes to suburb-based services. There has long been a call to better serve “everywhere to everywhere” trips that public transport-dependent users are more likely to make; the pandemic has highlighted the need for better non-radial services even more. But this change brings with it challenges and costs. High-demand trunk services are more financially stable with higher cost-recovery than lower-demand routes that serve a variety of destinations. With the loss of ridership during the pandemic primarily on the trunk networks, the financial model of many public transport operations will be called into question.

Service cuts limited accessibility for those compelled to continue using services during the pandemic. Service cuts in the United States worsened access to essential services and employment for communities with high levels of poverty, low car ownership, and higher concentrations of Black residents (Kar et al., 2022). The disproportionate impact of public transport service cuts on lower-income and vulnerable groups in Canadian and US cities was a prevalent finding across several studies (DeWeese et al., 2020; Palm, 2022; TransitCenter, 2022). While service cuts were common in some parts of the world, fare increases to formal public transport were not typical during the pandemic, thanks to significant emergency funding from national governments.

In many cities, informal public transport services filled gaps left by the cuts in formal public transport. For example, in Nairobi, all formal public transport services were temporarily banned, while in Mexico City, 20% of metro and bus rapid transit stations closed. But Nairobi's *matatus* and Mexico City's microbuses continued to provide mobility services to low-income residents who had to travel long distances to work (Calnek-Sugin and Heckt, 2020).

Informal public transport users faced rising fares, affecting essential and informal-sector workers who had to continue commuting during the pandemic. The revenue from informal public transport is 100% fare-based. In Bangladesh, Nigeria, and other countries where informal modes make up a significant portion of transport services, ticket prices rose to comply with distancing requirements and continue operating with lower patronage (Anwari et al., 2021; Mogaji et al., 2022). Travel costs increased for daily wage earners and other low-income workers dependent on the services to commute. The revenue shortfalls also led to severe economic consequences for informal public transport drivers. In Jakarta, drivers' incomes plummeted by 80% at the pandemic's start (Cheng, 2020).

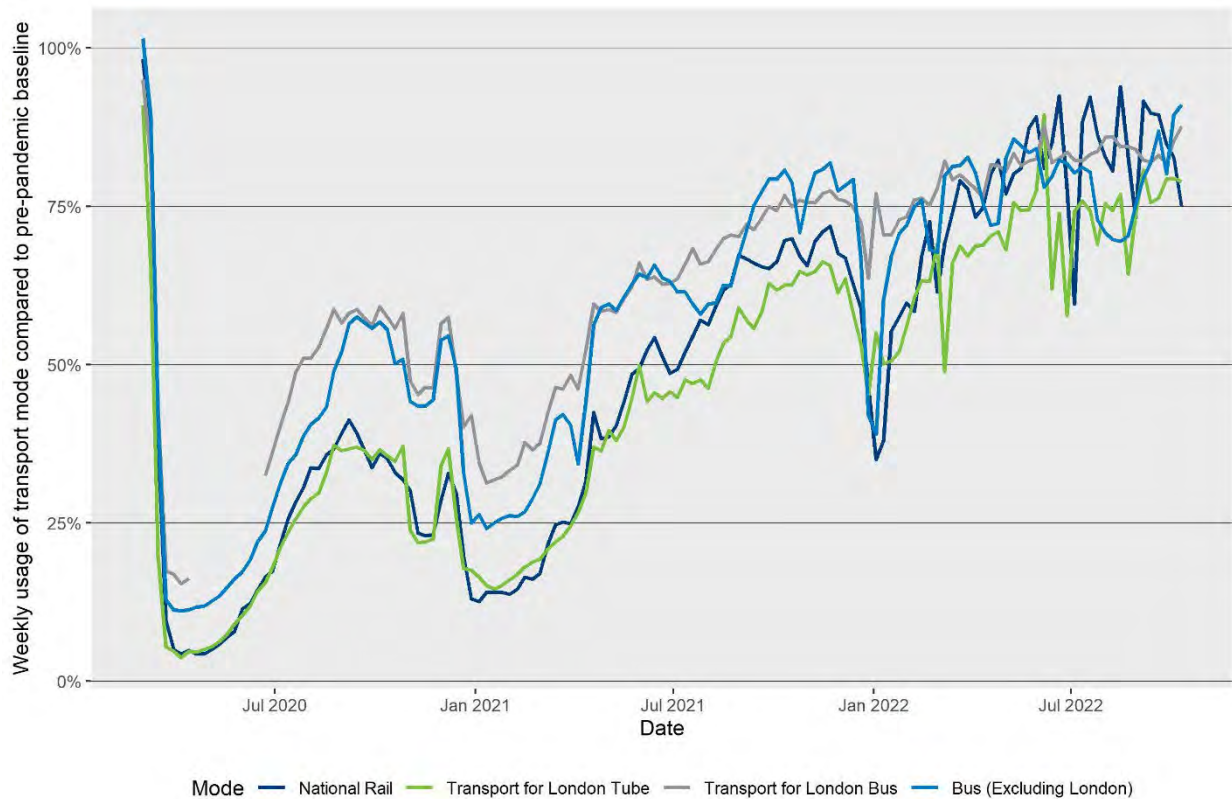
Some of these service changes intended to make travel on public transport safer made travel more challenging for specific groups. For example, measures that ended cash fare payments affected people without bank accounts. Requiring back-door boarding on buses without low floors made it difficult for older people and people with disabilities. According to experts, these measures have been rolled back due to equity concerns in some cities. Far from being a Covid-related problem, this points to a longer-term need for fully inclusive vehicle design, which would allow for flexible use and deployment of fleets in crises. It also highlights the need for diverse communication and fare options without creating barriers for individuals with limited digital access or competencies.

Safety concerns for women on public transport increased during the pandemic. The lower passenger volumes made travelling off-peak feel less safe, significantly impacting women who continued to work during the pandemic (UN Women, 2020). Women make up a large portion of essential care and informal workers in many countries. In a December 2020 study conducted in Delhi, 21% of low-income women expressed that buses were not stopping for them. They attribute this to the free ride scheme for women, introduced in 2019 by the Delhi government (Shah et al., 2021). Other sources also report discrimination against women and the preference of drivers to pick up paying male passengers. Covid-19 physical distancing rules limiting the number of passengers allowed on a bus exacerbated these issues (Zahra, 2022).

Recovering ridership on public transport has been asymmetric between modes. In some cities, bus use recovered much faster than rail modes, especially during 2020 and 2021. It is unlikely that this is due to the level of service provided by each mode – rather, it is an indication of the different user groups these modes serve. Essential workers and low-income workers are more likely to rely on buses. Meanwhile, light rail and rail users typically work in occupations suited to teleworking (APTA, 2022), and therefore have the flexibility not to use public transport. The initial drop in bus use was also not as high as with rail modes in the United States. The American Public Transportation Association data shows that in April 2020, bus use was at 28% of pre-pandemic levels, while rail modes had dropped to 10% (APTA, 2022). In New York City, bus boardings eclipsed subway boardings for the first time in a century in July 2020 (Palm, 2022). By December 2021, bus ridership was at 65% of pre-pandemic levels in the United States, while rail modes were at 52% (APTA, 2022).

Data from the Department for Transport in the United Kingdom (see Figure 2) shows that buses in London and the rest of the country recovered much faster during 2020 and 2021, consistently performing closer to pre-pandemic numbers than the London Underground and National Rail. In 2022, all public transport modes started to perform at a similar level, at around 80% of pre-pandemic conditions (DfT, 2022b).

Figure 2. Public transport usage in London, July 2020 to July 2022



Source: UK Department for Transport (2022b).

According to evidence from the United States, smaller cities have regained ridership levels faster than larger cities. By October 2022, the national average ridership was 71% of pre-pandemic levels. Small and medium-sized cities with less than two million inhabitants performed better, regaining 78-80% of pre-pandemic users. Larger cities of over two million residents averaged 69% (APTA and Transit App, 2022). Larger cities are home to more telework-compatible, knowledge sector jobs where public transport accounted for a larger share of commuting needs. Smaller cities and towns in the United States had smaller ridership numbers and have been less affected by changes in teleworking patterns (Barrero et al., 2021).

Returning to pre-pandemic levels of public transport ridership and increasing these numbers further to align with urban sustainability goals will not be easy. Public transport is the backbone of a transport system that reduces carbon emissions and air pollution and ensures affordable access for residents. Intentions to return to public transport are not even across regions or within populations. In Scotland, more than one-third expect to use public transport less, and one-quarter expect to drive more, according to survey responses from 2021 (Downey et al., 2022). Consecutive waves of a panel survey in New Zealand found that 10% of respondents did not expect to return to their prior level of public transport use in March 2022, but that decreased to 6% by May 2022 (Waka Kotahi New Zealand Transport Agency, 2022a, 2022b).

Decisions to use public transport depend on several factors. In the Indian context, social norms appear more important than personal preferences in deciding whether to use public transport post-pandemic. Whether someone had travelled by the mode recently also positively influenced their intentions to continue (Bandyopadhyaya and Bandyopadhyaya, 2022). Users who do not have other alternatives are also likely to continue (Tsavdari et al., 2022). Changes due to teleworking may be significant in sprawling

cities with high car ownership, where commuting trips are the primary focus of public transport services. Recovery will require a reformulation of how to plan and provide public transport.

Micromobility and active mobility received a new impetus

Many cities accompanied physical distancing mandates and service interruptions on public transport with the promotion of active modes and micromobility. Over 500 cities, from Bengaluru to Bogotá to Brussels, acted quickly to create pop-up cycling infrastructure to compensate for reduced public transport service and physically distanced travel during the pandemic (Combs and Pardo, 2021; Joshi et al., 2021). Within four months of implementation, pop-up bike lanes in 106 European cities increased cycling by between 11% and 48% on average (Kraus and Koch, 2021). Experts report that modes such as cycling have become more socially well regarded in some cities like Santiago de Chile. Uptake was strong in some parts of the world. US bicycle sales grew by 54% between April 2019 and April 2021 (Sorenson, 2021). Not all cities experienced this positive uptick in active mobility, however. Where road conditions and a lack of walking paths or cycle lanes persisted during the pandemic, this hindered growth in active travel.

Active mobility plans matter. A study of policy responses across the United Kingdom finds that local authorities that already had comprehensive active mobility plans could progress most efficiently in rolling out infrastructure during the pandemic (Marsden and Docherty, 2021). Other cities added infrastructure on an ad hoc basis. This approach reduced discrepancies in infrastructure provision in some communities but worsened them in others. Pandemic recovery will offer a chance to build on these initiatives and correct any disparities by focusing on completing disjointed networks.

Walking also increased in most parts of the world, by either choice or necessity. In some places with typically low mode share by walking, including the United Kingdom, the frequency of people walking at least three times a week was up 159% from pre-pandemic levels across demographics, and not just as a leisure activity. While those who did not own cars walked more than car owners before the pandemic, the gap between these groups' walking rates reduced – although non-car owners continued to walk more (Anable et al., 2022). In the Netherlands, 20% of people surveyed in a longitudinal study intend to walk and cycle more after the pandemic (de Haas et al., 2020).

In areas where public transport services were suspended or drastically reduced, users endured long wait times, or had to walk long distances (Joshi et al., 2021; Shah et al., 2021). Interviewees in a 2022 Nigerian study reported security and lack of lighting as a concern while walking. Most of those who reported walking more during the pandemic contemplated stopping when it was no longer necessary (Mogaji, 2022a, 2022b). Governments find monitoring walking trips difficult—especially in neighbourhoods and low-traffic areas outside city centres. Overall, the insights on how the pandemic affected walking are limited.

Some cities also introduced so-called slow streets (also called living streets, healthy streets, open streets or shared streets). Streets were closed off to traffic at certain times or subject to significantly limited speeds to encourage walking/wheeling, cycling and recreational activities (Combs et al., 2020). In the United States, while many were meant to be temporary initiatives, about half the programmes were extended beyond the initial months of the pandemic (Schmidt, 2022). Cities such as Bogota, Montreal, New York, and Paris have capitalised on these pop-up interventions to accelerate plans to build permanent infrastructure, reallocate road space, and create safer and more liveable cities.

These initiatives are not without controversy. When limited to specific neighbourhoods, they can neglect the needs of other residents. Critics in the United States highlighted that early adaptations failed to include marginalised (low-income, minority ethnic) communities and their needs (Schmidt, 2022). The importance

of buy-in from the community was a clear lesson when these initiatives were rolled out quickly with minimal consultation rather than as part of a long-term plan including stakeholder engagement as part of the process. To take another example, the Clean Air Street initiative in Bengaluru, India, found that reduced footfall during the pandemic strongly impacted businesses and owners, who were more open to such initiatives if they might increase customers (Joshi et al., 2021).

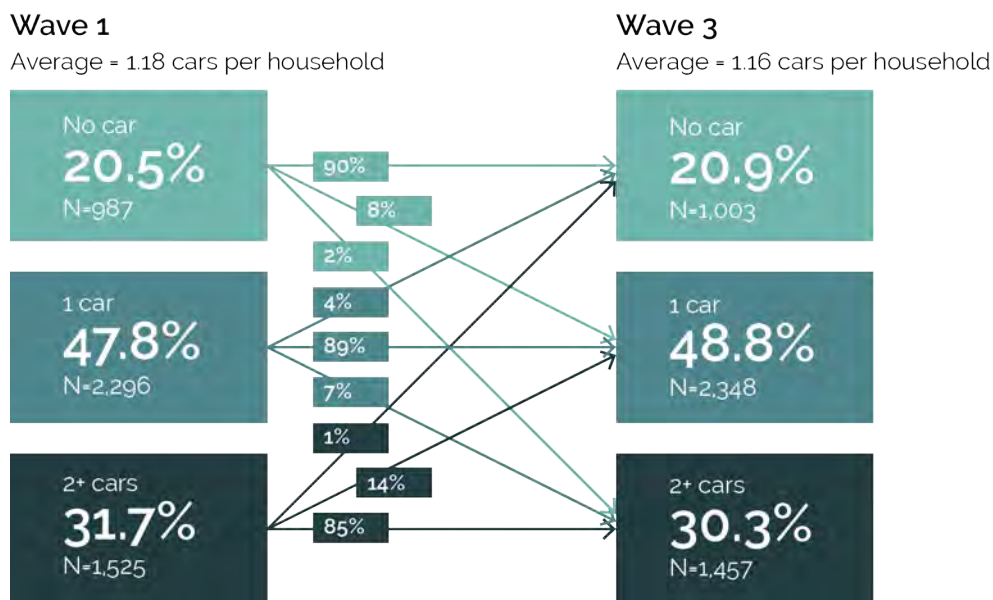
The pandemic’s effects on car use and ownership remain unclear

Whether car dependency will increase due to public transport impacts and lifestyle shifts remains unknown. More than two years into the pandemic, experts report that car use has recovered faster than public transport in countries such as Australia, Egypt, France, New Zealand, the Netherlands and Sweden. For example, car use increased significantly in Cairo, whereas walking and cycling did not experience as much of an uptick due to a lack of infrastructure and safety concerns. While traffic levels were often lower than before the pandemic, drivers are taking more risks leading to rising traffic deaths in some countries. In the United States, traffic fatalities began to rise in 2020 after several years of decline (Pappas, 2022).

Researchers have found a statistically significant move from two- to one-car households in the United Kingdom. Figure 3 shows the changing patterns of UK household car ownership between the first wave of the pandemic (June 2020) and the third wave (July 2021). Furthermore, on average, car use remains reportedly 10% below pre-pandemic levels. However, the timing of traffic varies, with weekend car travel rates higher than pre-pandemic levels (Anable et al., 2022; Anable and Marsden, 2022).

Leisure travel is now responsible for a larger share of travel demand – especially where working from home remains popular. Car use depends on where people live and their transport options. There are significant urban planning implications if people adopt new lifestyles and move to more car-dependent suburban areas. While for the majority of people worldwide, car use and ownership are associated with wealth, in some regions, car dependence is more prevalent in less affluent areas poorly served by public transport.

Figure 3. Decrease in household car ownership in the United Kingdom, June 2020 to July 2021



Source: (Anable et al., 2022).

The outlook for teleworking and its impact on cities

The shift to working from home at the scale seen during the Covid-19 pandemic was unprecedented. But significant rates of teleworking in a non-pandemic context represent even more uncharted territory for workers, employers, planners and policy makers. While teleworking resulted in lower traffic volumes in a pandemic context, as restrictions wane, working from home under more “normal” conditions does not guarantee an easy answer for cities seeking to reduce travel demand. The actual long-term impacts will need to be monitored and shaped to ensure the consequences are positive from a sustainability perspective and to limit potential adverse effects.

The immediate expectation is that teleworking, at least some days a week, and flexible work schedules will be more prevalent than before the pandemic, at least in cities where this was a significant reality during the pandemic (Tridemy, 2022). It will likely not be at the rate observed during the crisis. Its impact will differ significantly depending on the extent to which industries in the area are suited to teleworking, whether the work culture supports virtual work, and whether the available infrastructure (e.g. reliable broadband or home office equipment) can support teleworking.

Where a significant level of teleworking is likely to remain, its impact on transport, from an environmental perspective, will be based on its influence on mode choice and the vehicle-kilometres travelled. This will depend partially on whether or not there is widespread relocation of people and firms, which could, in turn, impact the viability of current transport offers and urban structures.

Teleworking’s effects on transport are still highly uncertain

Studies of pre-pandemic teleworking habits provide insight into how teleworking has affected trip frequency and distance and therefore total vehicle-kilometres travelled in the past. However, these trends have emerged based on a relatively small number of teleworkers, which has limited policy relevance. In the European Union, for example, 5.4% of workers usually worked from home between 2009 and 2019; nearly 40% were teleworking full-time early in the pandemic (EC, 2020). Covid-19 has expanded the scale of teleworking drastically. While it is unlikely that relying on past observations of teleworking will provide a complete picture, these studies offer some insights into the impacts of a larger-scale teleworking trend without any policy intervention.

Telecommuters tend to replace their daily work trips with additional trips, running errands or increasing leisure travel. Individuals tend to maintain a constant “travel time budget”, meaning that more travel quickly replaces any savings in commute times (Adobati and Debernardi, 2022). Studies in Switzerland and the Netherlands also find that teleworkers tend to live further away from their workplace (Adobati and Debernardi, 2022; Ravalet et al., 2017). In a 15-year study of UK households, teleworkers also made fewer work-related trips, but their trips were longer, eroding any potential reductions in travel that come from fewer trips. In addition, the combined travel distance of all household members was greater when a household member was teleworking. This may be because other household members had greater access to a car during the day (Caldarola and Sorrell, 2022). Another UK study also finds that teleworkers do not

reduce overall travel distances but tend to increase the distance travelled by car (Adobati and Debernardi, 2022; de Abreu e Silva and Melo, 2018). A recent study examining the last 100 years of travel change in Sweden concludes that it is unlikely that increased digitalisation and related changes in habits will lead to permanently reduced travel volumes. How people work, shop and play will change, but this will not greatly decrease physical travel (Eliasson, 2022).

The extent to which transport impacts trip frequency, distance and mode choice will depend on whether or not people relocate, the difference between their initial and subsequent locations, and the travel options available to them. Teleworking loosens constraints on where people choose to live. If this leads people to seek more affordable housing further away from the city, leading to a more dispersed population, studies from the United States and Europe highlight that teleworking can induce changes in residential locations, eroding some environmental benefits (Adobati and Debernardi, 2022). Take the example of an individual who lives in a well-connected urban location, commutes using public transport, and completes errands on their way home using a combination of walking and public transport. Suppose this person moves to a suburb with fewer public transport options and dispersed amenities. In that case, their infrequent commute trips will be longer and car-based, and any errands they run or additional trips they make instead of commuting will be over longer distances and reliant on a car. Such a shift would be a worst-case scenario from a sustainable transport perspective. While it would also present an area for active policy intervention, it remains unclear whether or not this is a trend.

People are relocating but primarily within major urban areas

Partial telework may not lead people to relocate to suburbs. A longitudinal study completed during the pandemic in the United Kingdom corroborates some of the findings of the pre-pandemic teleworking studies. Before the pandemic, full-time teleworkers were more likely than those who occasionally worked from home to live in areas with above-average rates of car commuting. However, those who sometimes worked from home before the pandemic lived in areas with higher rates of public transport and bike commuting (Anable and Marsden, 2022). For these individuals, the need to travel to the office occasionally may have influenced the decision to live in a more accessible area. During the pandemic, partial teleworkers and previous non-teleworkers became full-time teleworkers. Both groups were more likely to live in more accessible communities (Anable and Marsden, 2021). If businesses adopt a hybrid approach, where employees telework part-time, accessible neighbourhoods could still be attractive and a shift to car-dependent lifestyles might not be as imminent. However, a shift to permanent full-time teleworking still suggests that a move to car-dependent areas is a greater possibility.

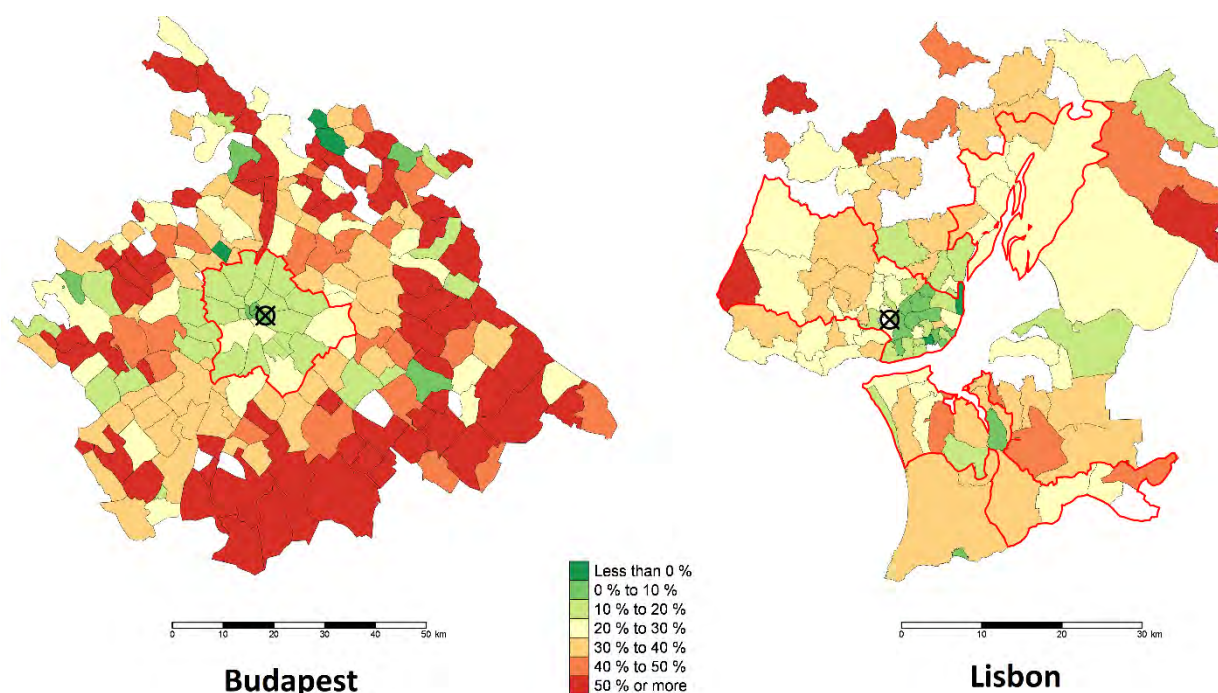
There is some evidence that relocation to the urban periphery is underway. The desire for more space and a decreased need to be close to business districts leads employees to seek housing outside cities. While there has been hope in some countries that teleworking will result in the revitalisation of rural areas and small towns due to the relocation of firms and people, studies in the United States and Japan show no evidence of this trend (Isono, 2022; Muro et al., 2021). There is evidence that smaller cities in the United States offering significant urban amenities attracted remote workers during the pandemic and may expect migration of people and relocation of firms in the long term (Marcus, 2020; Muro et al., 2021). Other studies see little evidence of movement from central to regional cities.

For the most part, relocation of households and businesses to suburban locations seems to be most common in and around major cities, dubbed by some researchers in the United States as the “donut effect” (Ramani and Bloom, 2021). The demand for suburban housing is growing in countries such as the United Kingdom and the United States (Caldarola and Sorrell, 2022; Sorrell, 2022). An analysis of Boston and New York City

found that the median house prices in surrounding suburbs and towns within a 90-minute commute radius went up by 30% and 25%, respectively. In Boston, central real estate prices only increased by 9%, while in New York City, prices in central boroughs declined by nearly 13% (Molla, 2021). Detailed house price data from thirteen OECD countries demonstrates that the value of homes in the urban centres in most cities of more than 1.5 million people has decreased; the rate of transactions has also increased in the suburbs while dropping in the centres.

Figure 4 shows the analysis for Budapest and Lisbon as an example. The study finds the suburbanisation trend is limited to large cities (Ahrend et al., 2022a). In 2021, more people moved out of central Tokyo than moved to the city for the first time since comparable data was first published in 2014 (Chiba, 2022). However, Tokyo’s residents are moving to the prefectures surrounding the city, and the population of the wider Tokyo metropolitan area is still growing (Isono, 2022).

Figure 4. Changes in house prices in Budapest and Lisbon, 2019 to 2021



Sources: OECD (forthcoming), based on data from the “Hungarian Central Statistics Office” (Budapest) and “Confidencial Imobiliário” (Lisbon). See also Ahrend et al. (2022b).

It is still too early to tell whether these changes are here to stay or instead a reaction to pandemic-style teleworking where the amenities offered by cities, restaurants, shopping, and social and cultural activities were also not as widely available. Teleworking, especially in a hybrid model, may not result in a significant exodus from central urban areas. Urban amenities also influence residential choice, alongside workplace location. Using an economic model of Los Angeles, researchers have found that areas with more urban amenities attract more and lose fewer residents compared to equidistant locations from the city centre when modelling relocation dynamics in a scenario with increased teleworking (Delventhal et al., 2022).

Not all cities should expect to deal with an outflow of residents. Cities in Africa, parts of Asia and Latin America undergoing rapid urbanisation will likely continue to do so. Teleworking is also not as widespread in these regions. Participants interviewed in Nigeria largely intended to stay in their current residential location, if already in an urban area, or to move to an urban area in search of better economic

opportunities. Teleworking was desirable but had less of an impact on residential location (Mogaji, 2022b). These rapidly urbanising cities will still face issues of transport provision for a growing population (ITF, 2021c). Lower-income cities also experience more urban sprawl. This is not a pandemic-triggered trend. Managing suburban development and peri-urbanisation will be relevant in cities across these regions, and in cities bracing for potential telework-induced suburbanisation trends (UN Habitat, 2021).

Teleworking's effects on transport provision

From a transport perspective, the ideal scenario would be if teleworkers live in areas with high accessibility by public transport and other more sustainable modes. Teleworking could reduce longer-distance motorised commutes and still make rebound trips possible without higher car dependency. In cities with a high share of public transport commuters, even in this scenario, a decrease in potential emissions would only occur through reductions in public transport capacity (e.g. fewer buses or shorter trains), at least at the peak (Adobati and Debernardi, 2022; White et al., 2007). However, given accessible neighbourhoods tend to come with a higher price tag, suburbanisation could be the more prevalent trend. In most cases, these peripheral urban areas are not as well-served by public transport, and the more dispersed, off-peak trips taking place in lower-density regions are not as viable to serve by traditional public transport modes.

In some cities, including Manila and Singapore, a reduction in public transport use is welcome from an operational perspective, especially during peak times. The demand for peak-hour travel was higher than what Manila's public transport could offer, leading to long wait times and crowding (Napalang, 2022). The city has a high public transport mode share; it is responsible for nearly 50% of trips, and another 30% are by foot (Regidor, 2022). A reduction in public transport travel will likely be a positive result if it does not indicate a mode shift to private cars. In Singapore, reducing the peak travel demand for public transport was a goal before the pandemic. Therefore, the transport authority's goal is not to recover ridership to 100% of pre-pandemic levels (Yap, 2022). However, Singapore is also a unique case, as there is a lower risk of a mode shift to cars, given the government-mandated cap on car ownership.

Teleworking may lead to reduced public transport use and greater dependence on cars. Urban public transport systems often rely on commuting trips, which tend to be high-demand, relatively linear and efficient to serve. These commutes are most typical of office-based occupations with a regular schedule which are also the kinds of jobs that are compatible with teleworking. A drop in commuting trips would reduce the number of these more efficient trips. Local trips could potentially replace commuter trips. However, the origins and destinations of local trips tend to be dispersed and demand is low, making them less financially feasible for public transport. Cycling and walking could meet some of this demand, depending on the proximity of neighbourhood destinations. The low density of suburbs and the segregation of land uses create longer distances between destinations. In these contexts, active travel is difficult, and public transport remains inefficient.

In cities with high rates of car commuters, typical of Canadian and US cities that developed primarily during the age of the car, teleworking may reduce car emissions. In Canada's eight largest metropolitan areas, 68% to 82% of commuters use private vehicles (Statistics Canada, 2019). If they start working from home, peak-hour car trips will reduce, and it is unlikely that their mode choice for local trips would change drastically, given the cities are already relatively car-dependent. So, the net reduction in commuting trips may reduce car use, while having a minimal effect on local trips. At the same time, fewer peak-hour commute trips generally result in reduced congestion and smoother flows (Adobati and Debernardi, 2022). While some studies report that this leads to fewer emissions for a travelled kilometre, improved traffic conditions can also support urban sprawl and lead to induced demand unless managed.

How policy makers can approach urban transport planning in a post-pandemic world

While policy makers recognise that the disruption from the pandemic can change existing trajectories in business practices, industries, ways of working, and public finances, decision makers still act on pre-pandemic planning assumptions, projects and policy plans (Marsden and Docherty, 2021). As governments worldwide consider their transport needs for a post-pandemic urban landscape, a shift in mindset is imperative to ensure they do not miss the opportunity to steer these new trajectories in a more sustainable direction.

The broad recommendations in this chapter focus on how policy makers can actively change traditional planning mindsets and shape cities and urban transport systems to be more equitable and sustainable moving forward. This change will involve accounting for uncertainty, people-centric policymaking and allocation of urban space that puts accessibility first while safeguarding the environment, and health and safety.

Adopt a “decide and provide” approach reinforced by data and stakeholder support

Policy makers should adopt a “decide and provide” rather than a “predict and provide” approach to transport planning (ITF, 2021a). Transport planning since the mid-1900s has relied heavily on forecasting models to predict future demand and then fill this need by increasing capacity on road networks. Rather than improving the movement of people, the goal essentially became unfettered travel for private vehicles, reinforcing dependency on cars and chasing an unattainable ideal of congestion alleviation. As capacity increases to reduce congestion, unrestricted travel induces more demand, and more drivers take to the roads. Furthermore, forecasts based on past trends can never fully encapsulate the uncertainty of travel demand. They may be more suitable in more stable travel environments but do not allow for new ways of thinking, priorities or societal trends (ITF, 2021a). Especially in the face of events of such scale as pandemics and economic downturns, forecasts do little to help plan for future outcomes.

Following a forecast-led, single-minded, congestion-minimisation approach has contributed to greater car dependency at the expense of other modes, leading to excessive greenhouse gas emissions, air pollution, community severance, lack of access, and road fatalities. When designing recovery policies, authorities must, more than ever, shift to a more holistic vision for the future. As cities look to tackle the multi-faceted challenges of mitigating climate change, improving the well-being of citizens, and delivering transport services in an efficient and economically viable manner, there is a need for a vision-led approach. No model could have forecast the potential for adaptation seen in the pandemic. Policy makers will need to lead rather than just respond to change. Sustainable urban mobility plans (SUMPs) are one example of a sustainable city vision, based on evidence and stakeholder input, serving as a guide for all future transport policies and interventions. In light of the lessons from Covid-19, SUMPs should also focus on resilience and

adaptation in the face of disruptions, enabling cities to function well in crises such as pandemics, climate events and economic constraints.

It will be necessary to monitor volatile trends and provide up-to-date insights to ensure policy visions remain evidence-based in times of uncertainty. This analysis will need to rely on a combination of data collection methods. Travel trends are mainly influenced by changes to broader society, although there are interactions with these and internal changes to the transport system (ITF, 2021a). It will also be necessary to take a proactive approach by monitoring these trends and understanding where they may be heading and who may be affected. Household travel surveys have often been the primary source of understanding travel behaviour. They offer a cross-sectional view of an average travel day for a sample of society which can then be extrapolated to the population. Such studies are considered robust enough to analyse travel patterns of different social groups based on gender, age, geography and other socio-economic characteristics. Longitudinal data can complement them to increase understanding of how changing life circumstances influence travel habits. These types of surveys, however, are costly and time-consuming to conduct and are not available in the timescales necessary for rapid decision making in volatile conditions such as a pandemic or its aftermath.

With increasing digitalisation, Big Data offers a rich source of revealed travel preferences, activities and habits, sometimes even in real-time (ITF, 2021b). With 96% of national statistical offices stopping face-to-face data collection during the pandemic, digital data sources had to fill in the gaps. Private companies such as Google, Citymapper, Apple and TomTom made their data public for policy makers and the public (Sehmi, 2020). While valuable, there are also conditions limiting use due to the commercial nature of the data. While Big Data is often incomplete and non-representative, it provides valuable insights into different lifestyles across parts of the population (ITF, 2021a, 2021b).

When the rapid generation of insights is needed, it is possible to blend data sources to provide more robust insights. Throughout the pandemic, city authorities gathered evidence using intercept surveys, online polls and interviews. These varied datasets helped inform decision making during the crisis. Even if sample sizes were small and non-representative, combined with traditional data sets and Big Data and interpreted with an appreciation for their limitations and biases, they can support decision making in constrained contexts.

The success of any vision-led approach will depend on stakeholder support. Creating opportunities for civic engagement during decision-making processes is imperative to ensure the successful implementation of policies and plans. Urban mobility visions and plans should be developed with stakeholders through co-creation and comprehensive engagement rather than simply consultation (Rupprecht Consult, 2019). One of the most significant barriers to the implementation is the opposition of affected stakeholders if they feel their options are limited without alternatives and there have been inadequate opportunities for feedback (see Box 1). Compensation packages for those who may “lose out” from implementing a policy should be considered early in the process – ideally as part of the policy itself and not an afterthought.

The pace of action was significantly faster during the pandemic, which added some challenges for engagement for brand-new schemes. But with nearly three years of experience, many local authorities have also improved their virtual and alternative methods. In urban areas with existing, long-range cycling, walking, and street-space plans, authorities were able to act quickly, but less controversially, on schemes that decided on through resident engagement. Post-pandemic engagement should have a renewed focus on resilience and actions in the short and longer term. Practitioners can take advantage of this juncture to invite people to think more boldly when imagining the future (Peters et al., 2020).

Box 1. Lessons from London's low-traffic neighbourhoods

London introduced 101 low-traffic neighbourhoods (LTN) during the Covid-19 pandemic in 2020 and 2021. LTNs filter out through-traffic, making use of funds from the government. They have received city-wide, highly vocal opposition and even vandalism. Some boroughs have removed some LTNs or scrapped the scheme altogether; of the 101 introduced, 30 have been removed. However, more people support than oppose the schemes (47% versus 16%). Those who live in an LTN are more likely to support the scheme (57%).

A similar scheme, "Mini Holland", implemented in 2014, met with initial resistance but now enjoys broad support. The scheme, funded by the City, included improvements for cycling and walking to support trips within the borough. The 2020 LTNs did not include such complementary measures. Limited bike repair vouchers and funds for cycling infrastructure were also made available by the government during the pandemic, but this was not co-ordinated with the LTNs.

London residents' three primary objections to the LTNs are the lack of alternatives to travel, unhappiness with the decision-making process and a lack of resident involvement, and the view that the LTNs are ineffective.

On the first issue, many Londoners want to walk or cycle but do not feel it is a safe alternative. Improving facilities for residents to walk and cycle safely is vital to achieving buy-in. Despite the feedback on the lack of other options, cycling has increased on the quieter LTN streets: by 7% in inner London and 22% in outer London compared to 2019. Encouraging cycling and walking was the principal aim of the LTNs. In contrast, a longitudinal study tracking residents living in Mini Holland scheme areas over three years found that they walked or cycled 41 minutes more per week than those outside these areas. There were spill-over effects for residents in nearby neighbourhoods as well.

On the second issue, unhappiness with the level of resident engagement was due to three related reasons. The local authorities' speed of decision making and implementation was much faster than other infrastructure projects, as required by the government. Typical engagement methods were unavailable during lockdowns, and online methods were not comprehensive. The simultaneous implementation across several city boroughs enabled a coalition of opposition to the schemes.

On the third issue, most Londoners think LTNs displace rather than reduce car use or are unsure if they do so. Evidence suggests LTNs reduced traffic significantly within the neighbourhoods, but there were mixed findings on whether boundary road traffic increased or decreased. Overall, any increases experienced outside LTNs were lower than decreases within. In contrast, two longitudinal Mini Holland studies found that residents decreased their car use and became less likely to own a car in the years following the scheme's implementation.

Local authorities should prioritise the following to ensure the long-term success of new LTNs:

- Street improvements (e.g. wider footpaths, street trees and safer crossings) to enhance the neighbourhood environment and support active travel
- Complementary initiatives and services for individuals less able to switch to alternative modes
- Early, comprehensive engagement with residents, community groups, and emergency services
- Effective communication of the scheme's goals and its effectiveness based on monitoring.

Source: Bosetti et al. (2022).

Focus on increasing accessibility over increasing mobility

One of the primary paradigm shifts associated with a “decide and provide” approach is the focus on improving residents’ access to opportunities rather than catering for greater mobility. Accessibility is determined by proximity to desired destinations and the kind of transport options available to individuals, given their circumstances, to connect them to the destinations. The goal is not to travel more but to access opportunities with as little travel as possible. Providing good levels of local accessibility for everyday needs provides resilience to a range of threats beyond pandemics (e.g. price spikes and weather events), as well as cutting emissions and building better communities. However, with the integration of digital connectivity, it is not only transport systems that can provide access but telecommunication systems as well, effectively removing the need for travel in some cases, as highlighted most prominently during the Covid-19 pandemic (ITF, 2021a; Lyons and Davidson, 2016). Virtual access can help overcome barriers people face with physical accessibility. The lack of adequate mobility options in pre-pandemic conditions directly impacted access to jobs for people with disabilities. While travel was made more difficult during the pandemic, the rise in the availability of home-based work opportunities could expand the selection of jobs available for people with disabilities (Dadashzadeh et al., 2022). Virtual access still requires technology, skills and broadband access and is not a direct substitute for physical accessibility.

Pandemic-induced changes in habits made the value of physical and virtual accessibility more obvious. The move from mobility-focused policies to accessibility-focused policies is not a new recommendation. There have been calls for people-centric planning for decades, but changing the status quo needs adequate citizen support, political backing, and funding. During the pandemic, people likely spent more time in their immediate neighbourhoods and online than ever. In some neighbourhoods, residents could meet their needs within a small radius, limiting their travel without losing access to essential services such as health care or leisure activities. Others, in neighbourhoods characterised by long distances and segregated land uses, were unable to do so. Those who had access to high-quality broadband and virtual means of work, school, entertainment and communication were at an advantage over those who did not. Accessibility, while traditionally thought of in the physical sense, has a virtual component that has become much more apparent and accepted during the pandemic. Considering virtual access when assessing accessibility may offer flexibility to improve accessibility, even if physical access improvements are difficult or slow to implement. Virtual access as a solution requires judicious consideration. It is not a substitute for all trips, nor is it viable for all people.

Accessibility-based policies can build on the momentum and realisations of this unique period. In particular, they can focus on the need for greater spatial proximity by accelerating plans to densify and create mixed-use communities. This holds especially true if people may be spending more time locally. In addition, it is crucial to improve broadband access, digital competencies, and the types of services available online. The pandemic made clear that physical mobility is not the only way to provide access. Transport improvements can favour active and cleaner modes to serve the necessary physical trips while limiting excess car travel. Recovery from the pandemic may be the most suitable time to move from accessibility ambition to action.

Reorient the use of city space around people not cars

To address the challenges of urban sprawl, urban and suburban communities must be more accessible. The principles of the 15-Minute City and transit-oriented development (TOD) both centre on concepts of accessibility. These concepts apply in cities trying to manage suburbanisation and more unsustainable living patterns due to teleworking, as well as those accommodating growing urban populations. Creating

dense neighbourhoods that allow for a diverse range of activities and needs to be met within a small radius means shorter local trips, even if they become more frequent. They also make active travel and micromobility more feasible. A collection of such neighbourhoods can support a polycentric city. While teleworking is often open to a minority of individuals, mainly in higher-paying knowledge sector jobs, having multiple neighbourhood “centres” increases the opportunities for diverse in-person working opportunities closer to home. If stores, restaurants, and other services are distributed around the city and located closer to home, people no longer have to travel far from residential neighbourhoods to city centres to work.

Suburbs can also be modelled around the 15-minute city concept, complemented by TOD, to prevent urban sprawl. While located further away from highly urbanised centres, adequate public transport can effectively connect neighbourhood centres centred on public transport hubs. While this would be a more inclusive public transport system catering for diverse travel needs, the financial efficiency of providing dispersed services is lower than the radial peak-hour services that cater for traditional commutes. Unless residents demand public transport trips between neighbourhoods is high, providing these services will be a financial challenge that requires evaluation at a time when public transport agencies are struggling. Japan, historically, built rail connections between villages. The public transport option provides services for shopping or accessing nature on weekends, beyond commuting. While an example of best practice, many of these routes are struggling today under low demand and diversion to car travel (The Economist, 2020). If car use remains high, the vision of transit-oriented compact suburbs and a sustainable, polycentric city model will prove incompatible and perpetuate urban sprawl. The next chapter contains further discussion of how transport services can meet new demand patterns.

A rich body of work already exists detailing the policy requirements for creating accessible neighbourhoods centred on public transport. The efforts pre-date the pandemic, but city authorities have a renewed challenge to manage the spatial reorganisation of cities during this uncertain period. They must ensure that housing, land use, and transport policies work together to prevent greater car dependency and a loss of the gains in past years of creating healthier, more sustainable, more vibrant cities.

Policy makers should accelerate plans to respace cities for people rather than cars, to prevent car dependency post-pandemic. As road traffic waned during the Covid-19 pandemic, cities reclaimed spaces previously reserved for driving or parking cars as public spaces. Cities worldwide, from Jakarta to London to Portland, converted car lanes into bus or bike lanes (ITDP, 2021). For example, in many cities, including Milan and Paris, on-street parking spaces became outdoor café seating, and parking lots became community parks and gathering spaces. In some cities, plans for these initiatives have been in the works but even getting to the pilot stage was often challenging. Cities now have a unique opportunity to make some of these schemes permanent, having already undergone a dramatic pilot phase during the pandemic. Urban areas with existing long-range cycling, walking and greenspace plans were able to activate and accelerate these early on in the pandemic. As initial lockdowns eased, much of what had been deployed fit a longer-term plan and thus was less under pressure to revert to pre-pandemic uses.

As cities recover, they should maximise the space given back to people, whether expanding the physical footprints of areas closed to motorised traffic or reallocating space during certain days or seasons (e.g. summertime, weekend or evening closures of streets). Many cities are making these interventions permanent. Seattle has permanently closed 20 miles (32 kilometres) of streets to motorised traffic. Seoul fast-tracked a bicycle-lane network and expressway to attain a 15% mode share for bicycles by 2030 (OECD, 2020a). Many European cities such as Amsterdam, Ghent and Ljubljana have been progressively pedestrianising their historic city centres since the late 1990s. The positive economic and societal outcomes provide successful case studies for other cities wanting to promote active travel.

Capitalise on the policy “sticks” made less controversial by the pandemic. It is always more politically palatable to implement “carrots” that offer incentives than “sticks” that penalise behaviours. However, in this post-pandemic period, authorities can implement policies that would previously have been considered contentious. For example, in contexts where traffic congestion or demand for parking has reduced due to the pandemic, people may be more receptive to policy “sticks” or “push” measures to limit car use and parking. Singapore, for example, is capitalising on areas where car traffic has reduced during the pandemic by moving forward with pedestrianising plans, converting road lanes to transit priority corridors, and accelerating its cycling infrastructure plan (Yap, 2022). When it comes to parking reductions, the business community often raises concerns about their potential impact on customers. However, reallocating parking spaces to allow streetside businesses to expand their offers is gaining traction and can be in a business’s interests. For example, the City of Paris’ programme to convert street parking to outdoor dining space has expanded, allowing more companies to take advantage of re-purposed parking spaces (see Box 2). While this is a “push” measure from the perspective of discouraging car use, the reallocated spaces are “pull” measures from the standpoint of active travel and micromobility. A low-traffic street provides a safer and more pleasant environment, encouraging people to walk, wheel, cycle and so on.

Other policy “sticks” that use pricing as a disincentive (e.g. fuel taxes and parking tariffs) may be more difficult to implement during the recovery period. This is partly due to the economic losses suffered by some during the pandemic and the exacerbating economic conditions caused by high inflation and the global energy crisis. Policy makers must balance financial relief measures with actions that promote rather than undo goals to achieve more sustainable cities. Disincentives that do not impose higher costs (e.g. reallocating road and parking space or lowering speed limits) may be more attractive.

Box 2. Converting on-street parking to outdoor terraces in Paris

In 2020, the City of Paris introduced an initiative to convert on-street parking to overflow dining space for restaurants. The initial programme was so successful that the city has further expanded it. Nearly 10 000 restaurants, bars and cafes in the city can apply to use up to three parking spaces in front of their businesses as outdoor dining spaces between April and October each year.

The city plans to extend the programme’s eligibility to include florists, bookstores and record stores. Businesses can also apply for a year-long terrace occupying one parking spot. The repurposed parking spaces must be wheelchair accessible and leave the footpath free for pedestrians. The programme is part of a larger plan to remove 60 000 parking spots to discourage drivers from bringing cars into the city.

Removing parking helps create more people-centred cities, reduces traffic and makes neighbourhoods more pleasant to walk and cycle. But examples like this prove that it can also support small businesses and create a more vibrant use of city space.

Sources: O’Sullivan (2021); Ville de Paris (2021).

Underpin recovery with environmental and health considerations

The pandemic demonstrated that policy makers were willing to go to great lengths to act in the name of health. Reducing air pollution must be prioritised in post-pandemic policies. Toxic air kills more than 8 million people worldwide annually – more than the cumulative 6.5 million deaths due to Covid-19 between the start of the pandemic and October 2022 (C40 Cities, 2022; Our World in Data, 2022). Virtually all (99%) people living in cities reside in areas with air pollution levels deemed unhealthy by the World Health Organization. Yet, policy makers have largely ignored this longstanding issue in a way that the acute impact of Covid-19 infection was not (C40 Cities, 2020). Transport is one of the main sectors responsible for air pollution. Long-term exposure to air pollution is associated with increased mortality in Covid-19 patients in multiple studies from Iran, Italy, the Netherlands, the United States and the United Kingdom (Hadei et al., 2021; UK Office for National Statistics, 2020; Wu et al., 2020).

Cities should not pursue recovery at the expense of air quality improvements. During lockdowns, air-quality improvements in cities including Beijing, Madrid, New Delhi, New York, Seoul and Tokyo were dramatic (Karuppasamy et al., 2020). While the push to “recover” is strong, especially given the economic condition many cities find themselves in, cities should not set themselves on a course to relapse rather than recover and undo the air-quality improvements seen during the pandemic. A case study from Cartagena, Spain, is not optimistic. After a reduction in mobility and air pollution in the first months of the pandemic, travel behaviour has shifted to favour private cars over public transport. The increase in walking and cycling has not made up for this difference. While total air pollution was still lower at the time of the study, it was trending towards levels even worse than those experienced before the pandemic (García-Ayllón and Kyriakidis, 2022). Encouraging shifts to public transport and active modes rather than cars, as well as the uptake of electric mobility, is vital to a recovery that reduces air pollution.

Managing post-pandemic integrated transport systems

As transport authorities worldwide design their recovery plans, many priorities and challenges remain from before the pandemic, such as addressing climate change and social inequality. These priorities demand action in a time of increased uncertainty and funding constraints, as well as a global cost-of-living crisis. While the previous chapter described how to approach transport and urban planning, this chapter focuses on how policy makers can manage transport systems in this period, focusing on public transport, active modes and micromobility. The overarching recommendation is to pursue the integration of modes and anchor this goal in a city's strategic vision. An integrated system better serves users, is better for the environment and is more resilient and adaptable (ITF, 2021c).

Transport systems and services need to cater for diverse user needs, must be decentralised to offer adequate service, and should consider all modes available, including informal public transport, shared mobility and other on-demand services. Public transport must focus on winning back passengers and attracting new ones to remain relevant. Cities should capitalise on the demand for active travel and micromobility by investing in infrastructure, making sure they are accessible to all. Creating an integrated transport system will require more data from diverse sources and integration across modes.

Cater for diverse travel purposes and travellers, not one archetype

The pandemic exposed gaps in how services are prioritised for certain types of trips and individuals. This section provides recommendations to move beyond that. Understanding patterns and changes in all trip types is necessary for creating a sustainable transport system that serves as many groups of people as possible and meets the demand for transport sustainably and affordably.

Transport systems should be designed for all travel purposes, not simply work-related commutes. With travel during the “regular” peak hour, central business district-based commute reduced in volume, the pandemic highlighted the importance of other trip types: non-typical commutes, care trips and leisure. Commutes make up a minority of trips taken by residents, yet are often the focus of transport data collection, services, and policies. For example, household travel surveys from the Greater Mexico City and Greater Sydney areas, and the US National Household Travel Survey, suggest that work trips make up less than one-fifth of all trips (INEGI and UNAM, 2017; Transport for NSW, 2020; US DOT, 2018). Regular commutes are only a portion of that. Estimates for the Greater Sydney area suggest that post-pandemic commutes may reduce from 17% to just 11% of all trips (Transport for NSW, 2021). With relative reduction in commutes expected to continue, at least in some parts of the world, due to teleworking, policy makers have an increased responsibility to account for diverse trip types and transport system users. Prioritising regular commutes means effectively deprioritising other trips and the individuals that take them.

The first chapter discussed lessons from the pandemic on the importance of serving the non-typical commutes of essential workers working irregular shifts in the medical, retail and service industries. In the United States, more than one-third of essential workers rely on public transport, and more than two-thirds

are from ethnic minorities (TransitCenter, 2020b, 2020a). Their travel patterns differ from the typical radial and peak-hour patterns served by high-frequency public transport networks offering the highest level of service. They are overrepresented as public transport users but underserved by public transport (TransitCenter, 2020). Immigrants, ethnic minorities and women comprise a considerable portion of the essential care workforce globally (Sato and Dempster, 2022). Inadequate transport access further exacerbates the challenges already faced by marginalised populations.

Care work continued through the pandemic, creating greater awareness of and appreciation for the demands of caregiving (ITDP, 2022). Care trips, in turn, gained a more visible profile, especially with the relative reduction in commuting due to telework in some parts of the world. Women disproportionately undertake household care trips (e.g. accessing health care, shopping, and supporting children). These trips do not follow the radial, peak-hour patterns of the “typical” commute for which public transport systems cater. The typical commute of a “hypothetical male breadwinner” shapes the built environment and transport services. Currently, there is little planning done with care trips in mind and little data available to understand better the needs of people making them (Huwe, 2021). The pandemic has highlighted the need to shift transport planning and policy approaches to consider care trips rather than focusing on the most profitable or efficient trips to serve (ITDP, 2022).

Leisure travel is also creating new patterns that defy pre-pandemic trends. Data tracking footfall in the 63 largest city and town centres in the United Kingdom shows that weekend footfall exceeds weekday levels and, in many cases, exceeds pre-pandemic levels of activity (Lalic, 2021). Also in the United Kingdom, car traffic on weekends exceeds pre-pandemic levels, highlighting the impact of leisure trips on transport systems (Anable et al., 2022). To prevent a shift to car use for non-commute trip purposes (including leisure and care trips), walking, public transport and other sustainable modes need to provide suitable, attractive alternatives for these trips.

Transport systems must cater for users’ diverse mobility needs – even during crises and shocks. During the pandemic, transport barriers most negatively affected people with disabilities and older adults. A study from the San Francisco Bay Area finds that the pandemic response aggravated difficulties in accessing transport that people with disabilities face regularly. These include problems accessing transport, a lack of reliable communication regarding transportation or health measures, and inadequate assistance completing trips (Cochran, 2020). These barriers increased isolation, and many more people with disabilities had to stay home. Findings were similar among older adults who experienced a much more significant drop in activity during the pandemic, partly due to their higher-than-average risk profile but also to difficulties safely accessing their needs (e.g. buying food or accessing health care). Demand-responsive transport services that many people with disabilities and older adults rely on were also suspended or reduced, limiting their options (Dadashzadeh et al., 2022). In a post-pandemic environment, transport services need to be resilient enough to withstand shocks without deprioritising individuals who rely on them for their basic needs and well-being.

Decentralise and diversify mass and shared transport services

Transport systems will need to diversify the spatial and temporal coverage of their networks to better cater for the trip types and needs that became more apparent during the pandemic. But this cannot be accomplished by public transport alone. While formal, fixed-route public transport is the backbone of a functional, sustainable urban transport system, it cannot meet all users’ needs. A well-integrated, multimodal system is necessary to meet travel needs and provide a viable alternative to car use. This was true before the pandemic but is now even more crucial because of it.

Plan for everywhere-to-everywhere travel networks, not just radial, peak-hour-based systems. Public transport authorities recognised the need for this during the pandemic. They adapted supply during the pandemic by redeploying services from lower-demand radial corridors to serve neighbourhood trips and routes across town that better served the needs of shift workers. As the relative importance of radial trips decreases in areas with increased teleworking, authorities could use the additional bandwidth to reconsider the distribution of routes and increasing frequencies in hotspot areas characterised by employment, care work, leisure activities and other travel needs.

Serving more diverse trip types is difficult for public transport operators to deliver, even outside financially constrained times. Some cities have identified opportunities due to the pandemic-induced “flattening of the peak” that public transport agencies can take advantage of. In Singapore, average public transport ridership is at about 79% of pre-pandemic levels, while ridership in off-peak periods has fallen by smaller amounts. There has been a “flattening of the curve”, which is the more optimal pattern that the Land Transport Authority (LTA) in Singapore was working towards pre-pandemic (Yap, 2022). While the total loss of riders has some financial impacts, it also leads to more efficient fleet use over its lifetime. The LTA expects it will ultimately be able to use fewer vehicles, so the trade-off has advantages.

Offering more dispersed routes and extended schedules, even with potential freed-up capacity from reduced commuting, is unlikely to be possible under a traditional public transport funding model alone. The central design principle in financially stable public transport planning has been to bring people from dispersed origins to central locations (the city centre or polycentric urban cores) at predictable times. These high-demand corridors are the most financially sustainable routes, subsidising other routes and services outside peak times. The economic viability of existing public transport systems will erode if the draw of these centralised destinations is no longer as strong and the timing of demand is more variable. Furthermore, with significant uncertainty about how travel patterns will change in the long term, a more flexible model is needed. Transport services must be more agile in areas where demand remains unknown, lower or highly variable.

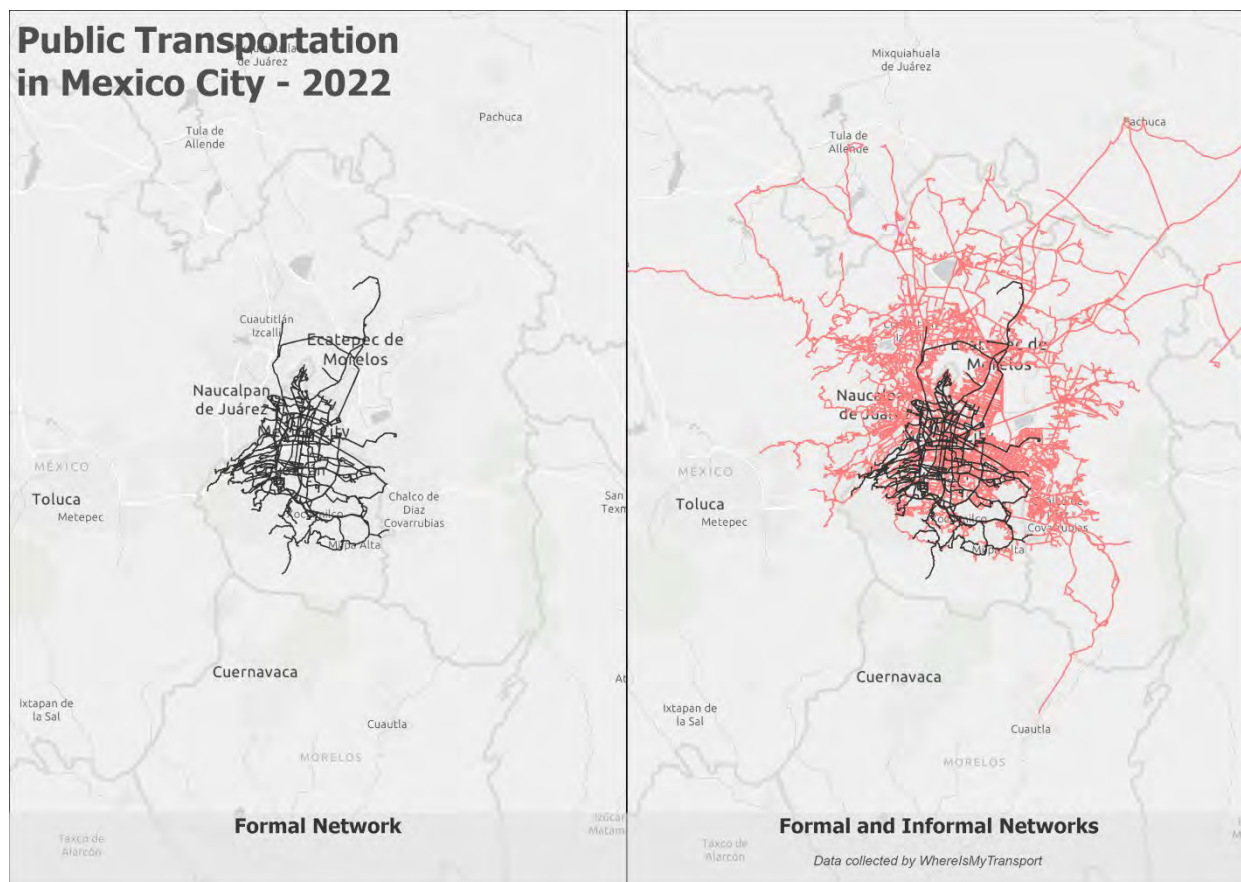
Improve the flexibility of systems through demand-responsive transport options to ensure efficiency and greater resilience under uncertainty. Shared mobility and on-demand services can complement rail and bus systems, allowing transport services to serve all users without incurring excessive costs. Demand-responsive transport is also more suited for peripheral areas and off-peak times, where bus routes may not be as feasible. However, services are still needed to connect residents with the public transport backbone. Many cities already have demand-responsive services but as dedicated programmes for users with mobility restrictions or other characteristics that make navigating traditional public transport more difficult. City authorities could consider expanding these services to include all user groups. Transport for Wales used the pandemic period to launch an on-demand service, *fflecsi*, in 2020. One year in, 9% of its passengers had never used public transport before the trial (Laker, 2022). Demand-responsive transport trials have not always ended successfully. But since the pandemic, numbers have been rising. During the third quarter of 2021, 450 such services existed worldwide. Of these, 54 commenced during that quarter, most contracted by governments rather than directly as business-to-customer ventures (Foljanty, 2021). Better-developed and integrated on-demand services will also better serve those already reliant on such programmes.

Include informal public transport as a core player in a wider transport network. Like demand-responsive transport and shared mobility, informal public transport in some cities serves neighbourhoods that lack connections to formalised public transport. The spatial coverage of their networks far exceeds formal public transport, as shown by the example of Mexico City (see Figure 5). In some cases, informal public transport services are residents’ main motorised transport option. In Nairobi, *matatus* serve 70% of all

commuters, and in Mexico City, public transport riders use minibuses to complete 74% of their trips (Bird et al., 2020; Calnek-Sugin and Heeckt, 2020). Peripheral services often serve the most vulnerable populations in a city and provide essential transport services to households otherwise be unable to access jobs and other destinations. During the pandemic, these services filled the even wider gaps left by the closures or service cuts of formal public transport systems, acting as a lifeline for those compelled to work outside the home (Calnek-Sugin and Heeckt, 2020).

Informal public transport requires no direct subsidies while meeting mobility needs. They can be affordable during normal operations and employ many people in the informal economy. Under pandemic conditions, despite not receiving state support, drivers have found resourceful and creative ways to install barriers and enforce physical distancing using boxes, sheets and plastic shields, according to examples from India and the Philippines. In Mexico City, microbus drivers shared routes and income to keep services running (Calnek-Sugin and Heeckt, 2020). *Matatu* drivers in Nairobi collaborated with Safaricom to transition to contactless fares via M-PESA, a mobile payment service (Safaricom, 2021). Despite difficult health and economic conditions, informal public transport has proven resilient and vital to urban transport systems. While there are disadvantages to the system, it is vital to recognise the service they provide. Any plans should seek to integrate them as a legitimate transport service alongside formal public transport. The environmental and social concerns that come from older, more polluting vehicle stock, difficult working conditions, sometimes-unreliable service, safety concerns and uncertain fare structures must be tackled with an appreciation for their role and the people they serve (Kumar et al., 2021).

Figure 5. Spatial coverage of Mexico City’s formal and informal public transport networks, 2022



Source: Data collected and maps produced by WhereIsMyTransport (2022).

Consider implementing service contracting for informal public transport that supports driver wellbeing and system improvements. While most informal public transport systems prove resilient to crises (e.g. pandemics) in the short term, most do not currently operate under sustainable economic models. Without income from fares, drivers' already tough working conditions can become unbearable. The system cannot run well without adequate fares, leading to inflation of costs to users and further reduced quality of service.

In the Philippines, Jeepney drivers previously faced long shifts (up to 15 hours a day), competition for passengers and only income-based fares. During the pandemic, they were left without incomes or the means to support their families. The Philippines Department of Transport launched a service-contracting scheme, which paid drivers to render services based on vehicle-kilometres operated rather than based on fares. Workers gain a more stable income and more reasonable hours, while users gain service that is more predictable and safer travel due to the terms of the performance-based contract. The contract considers vehicle-kilometres travelled, reliability, driver and vehicle quality, passenger satisfaction and security (Napalang, 2022). While authorities had tried similar initiatives in the past, people accepted their social benefits more readily in the pandemic context. Governments could consider launching such programmes to tackle social issues stemming from the pandemic and improve the transport system during recovery.

Win back public transport riders and target new users

Public transport must remain the critical backbone of a sustainable urban transport system but faces real challenges in achieving this mandate in the post-pandemic period. Winning back passengers starts with maintaining or improving high-quality services and keeping fares affordable. Recovery should also capitalise on initiatives during the pandemic, such as digitalisation, and explore opportunities for engagement between public transport operations and institutions and employers. Improving the safety of all passengers also needs to be a priority.

Prioritise funding and economic stability for transport operators to maintain service levels and affordable fares. As emergency funding runs out, public transport authorities and operators face extreme challenges in maintaining service levels in light of reduced fare revenue. The impacts of the pandemic have further undermined the resilience of fare-based funding for public transport, which does not fully account for the important social, economic and environmental role public transport plays. Access to funds determines service quality; minimum levels of quality must be maintained, if not improved, from pre-pandemic levels to retain and attract passengers.

Transport for London, which had one of the highest farebox recovery ratios pre-pandemic, suffered significantly and is now raising fares as part of a funding settlement from the UK government (Mayor of London, 2022; Topham, 2022). In the wider United Kingdom, over 100 local bus routes are facing cuts or being terminated completely (Jayanetti, 2022). Transit agencies in the United States face similar revenue shortfalls and low ridership recovery rates (Woodhouse, 2022). Sprawled cities are recovering more slowly from public transport service cuts and face even higher budget shortfalls due to low ridership recovery numbers (Kar et al., 2022). Some cities in Canada are also raising fares in 2022 after holding them constant through the early years of the pandemic (Gilligan, 2021). Public transport fares are being reduced in other parts of the world due to intervention from national governments or regional and local authorities (see the final chapter).

Policy makers need to recognise that raising fares and reducing services will hurt the prospects of attracting users back to public transport, stall progress towards fighting climate change, erode accessibility, and threaten to exacerbate the cost-of-living crisis. The value of funding public transport

should be considered in terms of its broader role and the costs of *not* supporting the service when deciding on funding arrangements. This is especially true in the short term: ridership remains particularly low due to the residual effects of the pandemic, and there is greater uncertainty for authorities.

New long-term revenue streams will be needed to fund public transport. Beyond the limits of fares and public subsidies, real-estate holdings, advertising and property taxes already contribute to public transport funding in some cities. Other pricing policies such as fuel taxes, congestion pricing and parking fees can help ensure that private vehicle use is priced appropriately (accounting for externalities) and help fund public transport services as an alternative (Litman, 2022). Given the current economic climate, such measures may present political difficulties and could even be considered regressive if the quality of other options is inadequate. An ITF Working Group is currently analysing how to fund public transport in the future.

Capitalising on and accelerating the digitalisation of public transport can help improve services in the long term. A recent survey of 38 transport operators identified digitalisation as the top measure to win back passengers (UITP, 2021). Many transport authorities took advantage of the pandemic period to roll out digital services, including online payment of fares or contactless fare payment and providing real-time passenger flow information. For example, the myMTA app in New York City provided users real-time data to show how many riders were on a given bus or train. *Matatus* in Nairobi partnered with a mobile payment service to move to contactless fares (Safaricom, 2021). Agencies invested in digital platforms during the pandemic. They can now use them to expand services further and provide users with more accurate real-time journey information, improve data collection for better planning, and simplify payments. Information on crowding could also help spread demand, reducing congestion and leading to greater passenger satisfaction.

Not all users will be able to access digital services, however, and new digital means should not impede those who do not have digital access from accessing these services. Access to a smartphone and broadband is not the only prerequisite to effectively using digital services. Digital skills and the ability to navigate virtual interfaces vary significantly within populations (Durand and Zijlstra, 2020). Low-tech options for payment, communication and journey planning should remain available. Universal design principles should guide any digital tools to ensure users with disabilities, including vision impairment, can benefit from them. Studies show that real-time assistance is vital when people cannot access digital services (Chiscano and Darcy, 2022).

Explore opportunities for collaboration between public transport authorities, schools and businesses. Public transport authorities have reported being less optimistic about partnerships with schools and employers to win back passengers (UITP, 2021). They have highlighted, however, interest in exploring agreements with institutions and employers to provide incentives for employers to implement flexible start times and encourage off-peak travel. In Budapest, public transport authorities identified that students in high school accounted for a significant portion of peak-hour users. They proposed shifting school start times to reduce the peak during the pandemic. After stakeholder discussions and strong communication efforts, about 20 high schools and some universities shifted their morning classes, and public transport schedules shifted to accommodate this change (UITP, 2022). While not common today, such arrangements could significantly affect corridors that largely serve a single population of workers or students. These agreements could help public transport authorities manage fleets more efficiently if scaled up. More work is needed to understand their potential impact.

Improve the safety of public transport to provide better service to users, particularly women. Health concerns may be waning, but there is a heightened awareness of safety concerns. Women reported feeling less safe, especially at night, as the number of people travelling by public transport dropped precipitously

during the acute phases of the pandemic (UN Women, 2020). There are concerns that continued depressed public transport ridership would exacerbate safety concerns. Overcrowding, on the other extreme, can also create unsafe environments for vulnerable travellers, including women, people with disabilities and older people. During the pandemic, fewer women reported crowding as a concern when taking buses, according to a study in India; only 7% compared to the 21% that reported it being an issue before Covid-19 (Shah et al., 2021).

Authorities need to ensure users can travel safely throughout their journeys to make public transport a safer alternative for all users. Authorities can locate public transport stops in areas of higher visibility to ease the first and last mile of travel. Station design should include natural surveillance, avoiding hidden spaces and dead ends. Lighting should be adequate and pedestrian flows designed to limit overcrowding (Dewar et al., 2021). Authorities need to dedicate enough resources, even in resource-constrained times, to ensure that reporting mechanisms are effective and responses are rapid. Low levels of reporting of incidents are reinforced by a lack of action (ITF, 2018).

Build on the momentum for active travel and micromobility

The shift to active travel was both necessary from a public health perspective and made more attractive to many during the pandemic. It is also a significant part of a post-pandemic response to climate change and health beyond limiting the spread of Covid-19. While temporary networks and the respacing of cities occurred at a record pace, implementation was not always fit for permanent use. The infrastructure and policies from the pandemic can be adapted and leveraged in the coming months and years to make active travel an everyday reality for more people. By working towards multimodal integration, authorities can accelerate plans that would have taken much longer to implement.

Transform pop-up micromobility and active mobility infrastructure into permanent, complete networks with connections to public transport. Some cities accelerated plans and built permanent cycling infrastructure (e.g. Buenos Aires), while others (e.g. Santiago) rolled back some temporary installations. In Buenos Aires (see Figure 6), city authorities installed cycle lanes during the pandemic as part of a goal to establish 300 kilometres of cycling infrastructure to facilitate one million daily cycle trips by 2023 (Buenos Aires Ciudad, 2022). Cities that deployed pop-up infrastructure under existing long-term visions rather than on an ad-hoc basis were more likely to keep or upgrade permanent schemes (Marsden and Docherty, 2021). These cities had already sought public input during the planning process and experienced less pressure to revert to pre-pandemic uses once lockdowns eased. Pop-up infrastructure initiatives still served as inadvertent pilots in cities pursuing more ad-hoc plans. Where monitored, they may provide insights for planners to develop more ambitious plans for extensive active travel networks in cities.

Cities must work towards building complete networks connected with public transport to enable multimodal travel and ensure all citizens benefit. In cities like Nairobi, where more than 40% of journeys are on foot, authorities must invest in proper footpaths to ensure safer travel (UN Habitat, 2020). Priority should be given to the most frequented and essential destinations and connections to other transport services. The Cycling Network of the Greater Paris Metropolis (*réseau parisien Vélopolitain*) connects with regional train routes. It is part of the Greater Paris region's network, which aims to cover the whole metropolis (Mairie de Paris, 2021). A total of 50 kilometres of the 180-kilometre-long network were installed as temporary cycle tracks during Covid-19 but will be made permanent.

Figure 6. An example of a cycle lane in Buenos Aires installed during the pandemic



Source: Mariano Rodriguez Ribas/Gobierno de la Ciudad de Buenos Aires (2020).

Permanent infrastructure should be safe, inclusive and accessible by default. Pop-up active travel lanes were not necessarily fit for all types of users. As they are made permanent and new infrastructure is built, they should be a viable and safe choice, regardless of travel needs and mobility impairments. All infrastructure should be designed as accessible infrastructure. It should be adapted for mobility scooters, tricycles, cargo bikes and other micromobility form factors. Addressing safety issues is crucial to encourage a larger share of women cycling; safety concerns are often a main deterrent. Women feel safer using off-road or fully segregated cycling infrastructure, according to a study conducted by the Philippines Department for Transport (Napalang, 2022). Similar findings in Singapore have led to efforts to improve walking and cycling infrastructure, especially off-road facilities (Yap, 2022).

Lower speed limits and traffic-calmed roads create a safer environment for pedestrians and micromobility users. Dedicated infrastructure is not the only solution for safe micromobility – and may not be the preferred solution. Japan is only second to the Netherlands in boasting a high mode share of cycling in urban areas, and women constitute the majority of cyclists (Goel et al., 2021; Lagadic, 2022). Only 1.6% of the road network in Tokyo is equipped with cycling infrastructure. However, 60% of its streets are less than 5.5 metres wide, winding and subject to 20 or 30km/h speed limits. These traffic-calmed streets tend to be preferred by female cyclists (Lagadic, 2022). High speeds result in higher crash rates and increase their severity, creating an unsafe environment for vulnerable road users and deterring the uptake of active travel. Reducing vehicle speeds to 30km/h also reduces the amount of space a vehicle takes up during use, allowing more space to be devoted to other uses (ITF, 2022). With higher rates of walking and cycling in cities due to the pandemic, ensuring the safety of these vulnerable road users and creating space for them is even more important. Cities such as Buenos Aires have instated low-speed zones in their city centres. European cities, including Brussels, Bilbao and Paris, took advantage of the pandemic years and

implemented a city-wide 30km/h limit across most roads in 2021, reducing serious injuries and fatal crashes, and leading to positive resident sentiments (Eurocities, 2021).

Ensure all residents have access to safe, inclusive, and accessible micromobility. Infrastructure alone is not enough to enable all citizens to take up micromobility. For all residents to take advantage of the post-pandemic prioritisation of active and micromobility, bike loan programmes and workshops to teach maintenance and safe riding can increase exposure and lower the barrier to entry. In the Netherlands, schoolchildren between the ages of 10 and 12 take a traffic exam to ensure they stay safe while cycling. The programme has been running in most Dutch schools for over 85 years (Raker, 2021). Paris is unrolling its “Know to Ride a Bike” training in all elementary schools, and England recently expanded its “Bikeability” programme to offer all children the training (DfT, 2020; Mairie de Paris, 2021). For individuals with specialised requirements, programmes introducing them to adapted forms of micromobility that fit their abilities or lifestyles can help them meet their day-to-day travel needs. Whether due to physical limitations or family responsibilities, there are forms of micromobility that can suit most users.

Embrace but regulate light motorised vehicles paying particular attention to the safety of micromobility users and pedestrians. A shift to more affordable lighter motorised vehicles can reduce air pollution. Motorised two- and three-wheelers such as motorcycles, mopeds and auto-rickshaws are also easier to electrify. Compared to heavier modes, their batteries are smaller and do not always need dedicated infrastructure for charging. To ensure light motorised vehicles play a role in the broader transport system, officials must place safety regulations at the heart of policies aimed at these vehicles to protect cyclists and other micromobility users.

Enforcing safety regulations for light motorised vehicle users continues to be problematic in many parts of the world. In the Philippines, conflicts between bicycles and motorcycles are a significant problem and compliance with safety regulations is low (Napalang, 2022). During the pandemic, moped and motorcycle use increased, particularly in Asia and Latin America, due to their affordability as well as health concerns about public transport. The lack of road traffic led to higher speeds and increased rates of crashes in some cities. Due to challenges in regulating their safe use, some cities, such as Lagos, Nigeria, have tried to ban motorcycles. Ideally, cities should not have to resort to such measures, given light motorised vehicles can be a form of affordable and cleaner mobility, requiring much less space in the city compared to cars. In the Netherlands, the city of Utrecht recently banned mopeds from using cycle lanes, but compliance remains low. Authorities have resorted to camera-based automatic fine systems to better enforce the regulations. If safety regulations can be enforced and users adopt a culture of compliance to ensure the safety of all road users, they can be a valuable part of a low-carbon transport system. Without increased attention to safety, the growing numbers of micromobility users since the pandemic face heightened risks.

Collect more data on active modes and micromobility

Modal integration requires better data. The lack of comprehensive data on walking and cycling is one of the main evidence gaps highlighted by the pandemic. The uptake of bicycles, scooters and new micromobility vehicles was notable during the disruptions of Covid-19, as was walking as a form of transport and exercise. Shared micromobility trips dropped between 2019 and 2020, but by mid-2021, monthly rides surpassed 2019 numbers in North America (NABSA, 2021). However, data on micromobility use and pedestrian traffic is minimal compared to the detailed traffic counts available for cars and other heavier road vehicles. To promote and grow active travel and micromobility post-pandemic, authorities need to invest in collecting data to understand demand patterns. During recovery, efforts must be made

to fill in the gaps in data where or from whom it may be missing so that interventions and impacts can be measured and monitored.

Authorities collect very little data on pedestrians (including pedestrians using wheelchairs or other mobility aids). Although there was some indication of changes in walking and wheeling during the pandemic, the evidence is mainly anecdotal or derived from surveys. In the United Kingdom, as in many countries, pedestrian counters are concentrated in city centres. According to studies and national surveys, while footfall (and reported footfall counts) in the centres dropped dramatically, people changed their neighbourhood walking habits, increasing walking by 159% compared to pre-pandemic levels (Anablet al., 2022). Without policies to sustain these trends, gains from the pandemic may be lost. Without knowing where demand for walking exists, it is impossible to make wise investments to support these habits.

Micromobility services generate data: through data-sharing requirements, they can help city authorities understand some demand patterns. However, this accounts for a minority of micromobility users worldwide. These datasets do not represent users who own their own bicycles or scooters. Automatic bicycle or pedestrian counters and sensors, manual counts (which are very labour-intensive), and camera-based systems can more accurately represent pedestrians or micromobility users, but only in specific locations (see Figure 7). Other methods that rely on GPS tracking include applications and sensor devices that collect cycling data. Often the data from these means are collected and sold by private businesses. Again, these methods are biased and only represent the travel of individuals who choose to download the app or buy a GPS-enabled product or sensor (ECF, 2022).

Figure 7. A bike counter in Paris tracking cyclists using dedicated infrastructure



Source: Philippe Crist (2022).

A single data collection method is insufficient, but varied sources can provide valuable insights. The combination of multiple approaches – counts, surveys, shared service providers and GPS trackers – will paint a richer and more representative picture of overall active travel and micromobility demand. Shifting data collection priorities from typical traffic counts to all modes can empower policy makers to work towards a multimodal vision of their city. It can help make a case for the reallocation of road space to walking or cycling infrastructure, connecting cycling networks to public transport and other services, and dedicating more parking areas. Integrating data from multiple modes is also the digital analogue for creating physical multimodal hubs and shared spaces. It can allow for easier journey planning, fare payment, and communication with users to reduce barriers to the uptake of multimodal travel choices.

Collect more information on the health and economic benefits of active travel. The pandemic demonstrated that active travel is under-measured, under-monitored and, therefore, not very well catered for. Yet, an ever-growing body of evidence underpins the societal gains from active travel. Walking/wheeling has significant health benefits and is one of the easiest, most affordable ways to maintain a healthy lifestyle (Kalmeiher et al., 2017). Beyond its benefits for health and the environment, the economic benefits of walking are significant and often overlooked. Pedestrians are better customers for local businesses and restaurants in dense urban settings, as they have more flexibility to make additional stops than drivers do. Research from London found that people who walked, cycled and used public transport spent 40% more each month in their local shops than car drivers (TfL, 2018). Pedestrian-friendly cities also have a positive effect on tourism and real estate value. Promoting walking also makes cities more resilient to transport disruptions, as seen during the pandemic. Cities can capitalise on growing awareness and public willingness to encourage active modes of daily travel.

Multi-level governance for a co-ordinated pandemic recovery

At the beginning of the pandemic, many responses to the spread of the virus were swift and applied nationwide until highly localised differences in the virus' impacts (e.g. in diffusion or the burden on health care systems) were realised (OECD, 2020b; UN Habitat, 2021). Increasingly, countries adopted more tailored approaches, relying on the actions of local actors. In the case of urban transport, cities were on the front lines, often determining their policy trajectories or carrying out national responses on the ground. Their proximity to affected populations and their more detailed understanding of transport needs meant they could mount faster and more flexible responses. However, they needed the funding power of national governments behind them, and the temporary relaxation of administrative procedures to remain agile.

Pandemic responses highlighted the importance of multi-level governance. Vertical co-operation between cities, regional and national governments was essential, as was horizontal co-ordination between local authorities. In addition, integration with non-government actors such as civic associations, health care professionals, public transport authorities and operators (OECD, 2020b) became crucial. Where local governments lacked decision-making powers, they faced greater difficulty managing the crisis (UCLG et al., 2020).

With a robust multi-level approach, governments can more effectively establish recovery policies for urban transport systems and align them with policies to tackle broader issues such as rising living costs and climate change. Policy alignment, in terms of objectives and between levels of government, is imperative to more efficiently use limited funds, and achieve progress on these time-sensitive issues. This chapter recommends multi-level governance approaches that empower local authorities to act with the backing of national governments. It concludes with an example of national policies that can revitalise the public transport sector at the urban and regional levels while reducing emissions and financial burdens on households.

Empower city authorities to transform mobility

City authorities understand the travel needs of the local communities they serve. Therefore, they were able to respond faster and develop more tailored policies to address local transport challenges. A global survey of 57 city and regional governments in July 2022 found that lack of autonomy at the subnational level to be one of the most significant governance challenges in responding to the crisis (UCLG et al., 2020). Decentralising responsibilities during crises and recovery can support experimentation and more innovative bottom-up solutions, with less risk if unsuccessful but the ability to expand if the results are favourable (Silberzahn, 2020). To have greater decision-making powers, cities need sufficient resources to fund and operationalise policies.

The lack of access to financial resources and the uncertainty of future funding undermines strategic planning by local authorities (UCLG et al., 2020). Cities are spending more in response to the crisis while simultaneously dealing with a reduced tax base due to the pandemic – a major source of revenue for city

authorities. In most countries, local governments are not allowed to run deficits, and the level of debt they can incur is legally limited. If revenues reduce, so too must expenditures, leaving little choice but to cut services. Publicly funded transport services such as public transport or active travel infrastructure are needed now more than ever. Reliable funding is necessary to help stabilise and re-establish a public transport backbone. The momentum for active travel investments is one of the undeniable policy areas to emerge from the pandemic. Local governments need to implement these changes but have limited authority to raise their own revenues and are heavily dependent on fiscal transfers for recovery policies (OECD, 2020). Long-term visibility of funding available is vital to enabling robust, ambitious policy responses at the local level.

National governments can mobilise significant funds in ways that local governments cannot. Their position also allows them to oversee the design and implementation of coherent and equitable action plans across regions. The transport sector was highly dependent on the new channels of national funds made available for local authorities. The Canadian government expanded the Investing in Canada Infrastructure Program to include a Covid-19 Resilience Stream, which introduced greater flexibility in fund allocation, more eligible project categories, accelerated approvals and a simplified application. Reducing administrative barriers helps cities access funds and implement projects such as active travel infrastructure and improving greenspaces quickly. The programme runs until 2023. The cost-sharing structure promises up to 80% or 100% in federal contributions depending on the applicant city, allowing a fairer distribution of federal funds based on need (Infrastructure Canada, 2022). Cities' contributions help ensure value for money and adequate buy-in and commitment.

European examples of national investment in local transport include a EUR 160 million Dutch scheme, introduced in 2020 and later expanded in 2021, to compensate companies providing transport services to those unable to take public transport during the height of the pandemic. Ireland launched a EUR 15 million scheme to support bus operators active in urban and suburban areas (EC, 2022a, 2022b). Small and micro enterprises were eligible to receive direct grants. The final relief package for bus and light rail services in the United Kingdom was made available in 2022. Throughout the pandemic, the UK government provided GBP 2 billion in relief funds for public transport (DfT, 2022a).

Align public transport recovery in cities with broader national policy goals

National governments can facilitate country-wide integration of public transport services to improve affordability and allow feasible alternatives to car ownership. With public transport agencies facing the end of emergency funding, many are considering service cuts or fare increases, which run counter to the actions needed to fight climate change and the current cost of living increase many are facing in 2022. National government action will be required to prevent the social, economic and environmental regression societies will face if more people become reliant on cars for transport. Several governments have already rolled out countrywide, integrated public transport programmes, easing cost-of-living increases while tackling climate change and strengthening the hard-hit public transport sector.

Germany introduced a popular monthly transport ticket for the northern summer of 2022 as part of its inflation-relief measures, allowing travel across local and regional transport (see Box 3). The EUR 2.5 billion federal government-funded programme successfully sold 52 million tickets during the three months it was active. One in five of these tickets were purchased by people who had never used public transport before (Burgen and Connolly, 2022; Federal Government of Germany, 2022; RFI, 2022).

Box 3. Germany's 2022 experiment with integrated public transport tickets

In June 2022, Germany introduced cheap (EUR 9) monthly transport tickets as part of a package of inflation-relief measures. Ticketholders could travel on local and regional transport services across the country. The federal government contributed EUR 2.5 billion to the programme, which proved successful and popular. Over the three summer months, passengers purchased 52 million tickets. One in five of these passengers had not previously travelled on public transport.

The integrated ticket helped bring ridership roughly back to pre-pandemic levels. In the first month of the programme, Deutsche Bahn's regional trains saw a 10% increase in passengers. In Berlin and Brandenburg, the increase was up to 25%. At the same time, high passenger numbers also resulted in overcrowded trains, and personnel numbers were insufficient to support demand. Critics of the programme pointed out that the government funding covered lost ticket revenue but did not include additional funds for extra staff or vehicles.

Since its conclusion in August 2022, federal and state authorities have discussed a successor to the programme. In October 2022, ministers agreed on a EUR 49 monthly ticket, but the question of funding remains unresolved. While state and federal authorities have pledged a total of EUR 1.5 billion per year to the scheme, this will not be enough to meet expected demand. Some cities, including Berlin, have stepped in with citywide discount tickets. At EUR 29, Berlin's monthly public transport ticket is more expensive than the summer 2022 offer but is in high demand.

According to one longitudinal study, the cheap summer ticket experiment has affected travel behaviour in the Munich area. By halfway through the three-month programme, 35% of participants reported using public transport more often, although only 3% reported less frequent use of their vehicles. More than one-fifth (22%) had not previously used public transport, while around one-quarter used these modes more than three days a week. Towards the end of the scheme, 48% reported increased public transport use, while 31% said they had decreased car use – a marked increase since the beginning of the survey. Around 90% of respondents who increased their use of public transport attributed their behaviour change to the introduction of the EUR 9 ticket. In contrast, only three-quarters of respondents who decreased car use did so. Unsurprisingly, a nationwide control group (which included non-urban areas) reported lower rates of mode shift due to the ticket (29% increased public transport use and 25% decreased car use).

Sources: Balgaranov (2022); Burgen and Connolly (2022); Federal Government of Germany (2022); Geerts (2022); Loder et al. (2022); RFI (2022); Restle (2022).

In September 2022, the Spanish government announced a scheme offering free travel targeted at commuters on suburban and mid-length rail journeys to curb cost-of-living increases. Initially meant to run until December 2022, the scheme now runs until December 2023. The ministry has cited mode shift to public transport and carbon dioxide (CO₂) reduction as a priority in addition to inflation relief in its decision to extend it (Burgen and Connolly, 2022; Doyle, 2022).

Austria's *Klimaticket* was announced in October 2021 after two years of negotiations as part of the government's initiatives to strengthen public transport under Austria's climate and environmental protection efforts. The *Klimaticket* is an annual ticket, which works out to EUR 3 per day for all journeys in Austria. Users can buy the ticket pre-tax through employers, and concessions are available to reduce the cost further for particular groups (Government of Austria, 2021). As of June 2022, the *Klimaticket* has more

than 170 000 subscribers; two-thirds of subscribers report using public transport more frequently and 85% report replacing car trips with public transport (OECD, 2022).

In April 2022, New Zealand halved its public transport fares to help curb the cost-of-living crisis, with an initial plan to end the programme in June 2022. At the time of writing, the scheme is due to wind up in January 2023 (Reuters, 2022; Waka Kotahi New Zealand Transport Agency, 2022a). One-quarter of travellers participating in a national survey reported adding at least one public transport journey in the past week due to the half-price fares, with around 10% switching from private vehicles and another 10% from active modes (Waka Kotahi New Zealand Transport Agency, 2022c).

Having a co-ordinated countrywide transport offer helps address one of the most significant barriers to giving up car ownership in cities: the lack of affordable travel options for getting out of the city. In many cases, it also demonstrates the value of a streamlined ticketing system (OECD, 2022). According to a study of the impacts of Germany's EUR 9 ticket, 84% of Munich-area respondents felt the ticket led to a more comprehensible pricing structure, and 80% were less worried about buying the wrong ticket (Loder et al., 2022).

For the long-term economic sustainability of these schemes, it will be necessary for governments to work out how to establish a similar offer of integrated mobility while also expanding services. Short-term programmes are extremely valuable pilots that provide an opportunity to understand demand and adjust factors accordingly. Plans for the successor to Germany's EUR 9 ticket in 2023 are underway, although the question of funding remains unresolved (Geerts, 2022; RFI, 2022). An important lesson from the programme is the importance of adequate funding to increase capacity and staff to manage the demand increase (Restle, 2022). Without long-term attention to these operational costs, the reduction in quality of service is unlikely to support sustained enthusiasm from customers. The integration and quality of the transport system is a more significant driver of modal shift to public transport from cars than fare reductions. Pricing tools alone are inadequate (de Haas et al., 2023).

Monitoring the performance of these programmes in increasing mode shift from car to public transport and saving carbon emissions will be necessary to justify public spending at multiple levels of government. In Austria, with the annual ticket, it is not necessary to reserve or obtain a new ticket every time one travels. Therefore, the scheme does not allow authorities to know when, where and how often an individual uses the ticket. Using an app, online logs, written surveys and phone interviews – as well as ticket inspections – a private research company helps collect data on usage patterns (infas Institute for Applied Social Sciences GmbH, 2022). Providing users with multiple ways to participate ensures a more representative indication of the use patterns of all residents. Longitudinal studies of Germany's EUR 9 ticket also demonstrate the importance of monitoring over time. Behavioural change is slow, and while changes may be minimal in the initial months of a scheme, they can increase with time (Loder et al., 2022).

References

- Abdullah, M. et al. (2020), “Exploring the impacts of COVID-19 on travel behavior and mode preferences”, *Transportation Research Interdisciplinary Perspectives*, Vol. 8, 100255, <https://doi.org/10.1016/J.TRIP.2020.100255>.
- Adobati, F. and A. Debernardi (2022), “The breath of the metropolis: smart working and new urban geographies”, *Sustainability*, Vol. 14/2, <https://doi.org/10.3390/su14021028>.
- Ahrend, R. et al. (2022a), “Changes in the geography housing demand after the onset of COVID-19: First results from large metropolitan areas in 13 OECD countries”, OECD Economics Department Working Papers, No. 1713, OECD Publishing, Paris, <https://doi.org/10.1787/9a99131f-en>.
- Ahrend, R. et al. (2022b), “Has COVID-19 triggered an urban exodus?”, OECD Forum Network, www.oecd-forum.org/posts/more-room-with-a-view-has-covid-19-triggered-an-urban-exodus (accessed 17 January 2023).
- Alta Planning+Design and Behavioural Insights Team (2018), “Applying Behavioural Insights to Transportation Demand Management”, <https://altago.com/resources/behavioral-insights-transportation-demand-management/> (accessed 17 January 2023).
- Anable, J. and G. Marsden (2021), “Covid-19 Transport, Travel and Social Adaptation Study: Understanding behaviour change with neighbourhood characteristics”, Centre for Research into Energy Demand Solutions, Oxford, United Kingdom, www.creds.ac.uk/publications/covid-19-transas-understanding-behaviour-change-with-neighbourhood-characteristics.
- Anable, J. and G. Marsden (2022), “UK Transport and Travel Adaptation Study (TRANSAS)”, Presentation at the ITF Roundtable “Shaping Post-Covid Mobility in Cities”, 8 June 2022, <https://youtu.be/eR5XxTyFRes>.
- Anable, J. et al. (2022), “Less is more: Changing travel in a post-pandemic society”, Centre for Research into Energy Demand Solutions, Oxford, United Kingdom, www.creds.ac.uk/publications/less-is-more-changing-travel-in-a-post-pandemic-society.
- Anwari, N. et al. (2021), “Exploring the travel behavior changes caused by the COVID-19 crisis: A case study for a developing country”, *Transportation Research Interdisciplinary Perspectives*, Vol. 9, <https://doi.org/10.1016/j.trip.2021.100334>.
- APTA (2022), “APTA public transportation ridership update”, April 2022, American Public Transportation Association, www.apta.com/wp-content/uploads/APTA-Transit-Ridership-Brief-April-2022.pdf.
- APTA and Transit App (2022), “APTA ridership trends”, American Public Transportation Association, <https://transitapp.com/APTA>.
- Astroza, S. et al. (2020), “Mobility changes, teleworking, and remote communication during the COVID-19 pandemic in Chile”, *Findings*, <https://doi.org/10.32866/001c.13489>.

- Badia, A. et al. (2021), “A take-home message from COVID-19 on urban air pollution reduction through mobility limitations and teleworking”, *npj Urban Sustainability*, Vol. 1/35, <https://doi.org/10.1038/s42949-021-00037-7>.
- Balbontin, C. et al. (2021), “Impact of COVID-19 on the number of days working from home and commuting travel: A cross-cultural comparison between Australia, South America and South Africa”, *Journal of Transport Geography*, Vol. 96, <https://doi.org/10.1016/j.jtrangeo.2021.103188>.
- Balgaranov, D. (2022), “Berlin launches a ‘9-euro ticket’ successor to great demand”, The Mayor, www.themayor.eu/en/a/view/berlin-launches-a-9-euro-ticket-successor-to-great-demand-11049.
- Bandyopadhyaya, V. and R. Bandyopadhyaya (2022), “Understanding public transport use intention post Covid-19 outbreak using modified theory of planned behavior: Case study from developing country perspective”, *Case Studies on Transport Policy*, Vol. 10/4, 2024, <https://doi.org/10.1016/J.CSTP.2022.09.002>.
- Barajas, J.M. (2021), “The roots of racialized travel behavior”, *Advances in Transport Policy and Planning*, Vol. 8, pp. 1-31, <https://doi.org/10.1016/BS.ATPP.2021.06.007>.
- Barrero, J.M., N. Bloom and S.J. Davis (2021), “Why working from home will stick”, National Bureau of Economics Working Papers, No. 28731, www.nber.org/papers/w28731.
- Bartik, A.W. et al. (2020), “What jobs are being done at home during the Covid-19 Crisis? Evidence from firm-level surveys”, National Bureau of Economic Research Working Papers, No. 27422, www.nber.org/papers/w27422.
- Bird, J., S. Kriticos and N. Tsivanidis (2020), “Impact of COVID-19 on public transport”, International Growth Centre, www.theigc.org/blog/impact-of-covid-19-on-public-transport.
- Bonacini, L., G. Gallo and S. Scicchitano (2021), “Working from home and income inequality: Risks of a ‘new normal’ with COVID-19”, *Journal of Population Economics*, Vol. 34/1, pp. 303-60, <https://doi.org/10.1007/S00148-020-00800-7>.
- Bosetti, N. et al. (2022), “Street Shift: The Future of Low-Traffic Neighbourhoods”, Centre for London, www.centreforlondon.org/publication/london-low-traffic-neighbourhoods/.
- Brussevich, M., E. Dabla-Norris and S. Khalid (2020), “Who will Bear the Brunt of Lockdown Policies? Evidence from Tele-workability Measures Across Countries”, International Monetary Fund Working Papers, No. 20/88, www.imf.org/en/Publications/WP/Issues/2020/06/12/Who-will-Bear-the-Brunt-of-Lockdown-Policies-Evidence-from-Tele-workability-Measures-Across-49479.
- Buehler, R. and Pucher, J. (2022), “Cycling through the COVID-19 pandemic to a more sustainable transport future: Evidence from case studies of 14 large bicycle-friendly cities in Europe and North America”, *Sustainability*, Vol. 14/12, <https://doi.org/10.3390/su14127293>.
- Buenos Aires Ciudad (2022), “Alcanzar 300 km de ciclovías y 1.000.000 de viajes diarios en bici” [Reach 300 kilometres of cycle paths and 1 000 000 daily trips by bike], www.buenosaires.gob.ar/compromisos/alcanzar-300-km-de-ciclovias-y-1000000-de-viajes-diarios-en-bici.
- Burgen, S. and K. Connolly (2022), “Free rail travel scheme begins in Spain to cut commuters’ costs”, *The Guardian*, www.theguardian.com/world/2022/sep/01/free-rail-travel-scheme-begins-in-spain-to-cut-commuters-costs.
- C40 Cities (2020), “Clean Air Accelerator”, www.c40.org/accelerators/clean-air-cities.

- C40 Cities (2022), “Global cities convene in London to tackle triple threat of congestion, air pollution and the climate emergency”, Press release, www.c40.org/news/global-cities-london-tackle-threat-congestion-pollution-climate-emergency.
- Caldarola, B. and S. Sorrell (2022), “Do teleworkers travel less? Evidence from the English National Travel Survey”, *Transportation Research Part A: Policy and Practice*, Vol. 159, pp. 282-303, <https://doi.org/10.1016/J.TRA.2022.03.026>.
- Calnek-Sugin, T. and C. Heeckt (2020), “Mobility for the Masses: The essential role of informal transport in the COVID-19 recovery”, LSE Blogs, www.lse.ac.uk/cities/publications/blogs/mobility-for-the-masses.
- Cheng, T.-J. (2 May 2020), “Restoring trust in public transport: the way forward”, CityTalk blog, ICLEI – Local Governments for Sustainability, <https://talkofthecities.iclei.org/restoring-trust-in-public-transport-the-way-forward>.
- Chiba, D. (2022), “Farewell, Tokyo: More residents move out as telework takes hold”, Nikkei Asia, <https://asia.nikkei.com/Business/Markets/Property/Farewell-Tokyo-More-residents-move-out-as-telework-takes-hold>.
- Chiscano, M.C. and S. Darcy (2022), “An accessible and inclusive public transportation management response to COVID-19 through a co-creation process with people with disability: The case of Metro Barcelona”, *Research in Transportation Business and Management*, Vol. 45/Part C, 100880, <https://doi.org/10.1016/J.RTBM.2022.100880>.
- Cochran, A.L. (2020), “Impacts of COVID-19 on access to transportation for people with disabilities”, *Transportation Research Interdisciplinary Perspectives*, Vol. 8, 100263, <https://doi.org/10.1016/J.TRIP.2020.100263>.
- Colard, J., J. Ni and N. Meilhan (2020), “Point of view: Mobility and Covid-19: What impacts on transport behaviour and policies?”, France Stratégie, www.strategie.gouv.fr/english-articles/mobility-and-covid-19-what-impacts-transport-behaviour-and-policies.
- Combs, T. and Pardo, C. F. (2021), “Shifting streets COVID-19 mobility data: Findings from a global dataset and a research agenda for transport planning and policy”, *Transportation Research Interdisciplinary Perspectives*, Vol. 9, <https://doi.org/10.1016/J.TRIP.2021.100322>.
- Combs, T. et al. (2020), “Shifting Streets” Covid-19 mobility dataset, www.pedbikeinfo.org/resources/resources_details.cfm?id=5235.
- Dadashzadeh, N. et al. (2022), “Travel behaviour of vulnerable social groups: Pre, during, and post COVID-19 pandemic”, *International Journal of Environmental Research and Public Health*, Vol. 19/16, <https://doi.org/10.3390/ijerph191610065>.
- De Abreu e Silva, J. and P.C. Melo (2018), “Does home-based telework reduce household total travel? A path analysis using single and two worker British households”, *Journal of Transport Geography*, Vol. 73, pp. 148-62, <https://doi.org/10.1016/J.JTRANGEO.2018.10.009>.
- De Haas, M., R. Faber and M. Hamersma (2020), “How COVID-19 and the Dutch ‘intelligent lockdown’ change activities, work and travel behaviour: Evidence from longitudinal data in the Netherlands”, *Transportation Research Interdisciplinary Perspectives*, Vol. 6, 100150, <https://doi.org/10.1016/J.TRIP.2020.100150>.

- De Haas, M., M. Terwindt and J.-J. Witte (2023), “Pricing tools: better as a package”, KiM Netherlands Institute for Transport Policy Analysis, The Hague, <https://english.kimnet.nl/publications/publications/2023/01/05/effects-of-lowering-public-transport-fares>.
- De Palma, A. and S. Vosough (2021), “Long, medium, and short-term effects of COVID-19 on mobility and lifestyle”, *Théorie Economique, Modélisation et Applications (THEMA) Working Papers*, No. 2021-06, Université de Cergy-Pontoise, <https://thema.u-cergy.fr/IMG/pdf/2021-06.pdf>.
- Delventhal, M.J., E. Kwon and A. Parkhomenko (2022), “JUE Insight: How do cities change when we work from home?”, *Journal of Urban Economics*, Vol. 127, 103331, <https://doi.org/10.1016/J.JUE.2021.103331>.
- DfT (2022a), “Over £150 million provided to safeguard local transport services as the country emerges from the pandemic”, Department for Transport, London, www.gov.uk/government/news/over-150-million-provided-to-safeguard-local-transport-services-as-the-country-emerges-from-the-pandemic.
- DfT (2022b), “Transport use during the coronavirus (COVID-19) pandemic”, Department for Transport, London, www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic.
- DfT (2020), “Every child in England to be offered cycle training”, Department for Transport, London, www.gov.uk/government/news/every-child-in-england-to-be-offered-cycle-training.
- Dewar, A., F. Anatole and T. Wilson (2021), “Station Design Guidance”, Design Manual NR/GN/CIV/100/02, Network Rail, London, www.networkrail.co.uk/wp-content/uploads/2021/06/NR_GN_CIV_100_02_Station-Design.pdf.
- DeWeese, J. et al. (2020), “A tale of 40 cities: A preliminary analysis of equity impacts of COVID-19 service adjustments across North America”, *Transport Findings*, <https://doi.org/10.32866/001c.13395>.
- Downey, L. et al. (2021), “Impact of COVID-19 on travel behaviour, transport, lifestyles and location choices in Scotland”, ArXiv: Applications, <https://doi.org/10.48550/arXiv.2104.10440>.
- Downey, L. et al. (2022), “The impact of COVID-19 on future public transport use in Scotland”, *Transportation Research Part A: Policy and Practice*, Vol. 163, pp. 338-52, <https://doi.org/10.1016/J.TRA.2022.06.005>.
- Doyle, E. (2022), “Spain extends free train travel scheme into 2023”, *The Independent*, www.independent.co.uk/travel/news-and-advice/spain-extend-free-travel-scheme-2023-b2199399.html.
- Durand, A. and T. Zijlstra, (2020), “The impact of digitalisation on the access to transport services: a literature review”, KiM Netherlands Institute for Transport Policy Analysis, The Hague, <https://english.kimnet.nl/publications/publications/2020/06/29/the-impact-of-digitalisation-on-the-access-to-transport-services-a-literature-review>.
- ECF (2022), “Cycling data collection”, European Cyclists’ Federation, <https://ecf.com/what-we-do/urban-mobility/cycling-data-collection>.
- The Economist (2020), “Japan’s rural railways are disappearing”, *The Economist*, www.economist.com/asia/2020/09/10/japans-rural-railways-are-disappearing.

- Eliasson, J. (2022), “Will we travel less after the pandemic?”, *Transportation Research Interdisciplinary Perspectives*, Vol. 13, 100509, <https://doi.org/10.1016/J.TRIP.2021.100509>.
- Eurocities (2021), “Road safety: Fewer accidents in Brussels’ 30 km/h city”, <https://eurocities.eu/latest/road-safety-fewer-accidents-in-brussels-30-km-h-city>.
- EC (2022a), “Ireland: Details of Ireland’s support measures to help citizens and companies during the significant economic impact of the coronavirus pandemic”, https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/jobs-and-economy-during-coronavirus-pandemic/state-aid-cases/ireland_en.
- EC (2022b), “The Netherlands: Details of The Netherlands’ support measures to help citizens and companies during the significant economic impact of the coronavirus pandemic”, https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/jobs-and-economy-during-coronavirus-pandemic/state-aid-cases/netherlands_en.
- European Commission (2020), “Telework in the EU before and after the COVID-19: Where we were, where we head to”, Science for Policy Brief, EU Joint Research Commission, Brussels, https://joint-research-centre.ec.europa.eu/system/files/2021-06/jrc120945_policy_brief_-_covid_and_telework_final.pdf.
- Federal Government of Germany (2022), “How the relief package will affect ordinary citizens”, www.bundesregierung.de/breg-en/news/relief-faq-2065498.
- Fernandez Cras, P. and D. Baazil (2022), “Dutch house approves to make work from home a legal right”, Bloomberg, www.bloomberg.com/news/articles/2022-07-05/dutch-parliament-approves-to-make-work-from-home-a-legal-right.
- Foljanty, L. (2021), “On-demand ridepooling market size”, Medium, <https://lukas-foljanty.medium.com/on-demand-ridepooling-market-size-f3ff93845c5c>.
- Fuceri, D., P. Loungani and J.D. Ostry (2020), “How pandemics leave the poor even farther behind”, International Monetary Fund, www.imf.org/en/Blogs/Articles/2020/05/11/blog051120-how-pandemics-leave-the-poor-even-farther-behind.
- Future Forum (2022), “Future Forum Pulse Summer Snapshot 2022”, <https://futureforum.com/2022/07/19/pulse-summer-2022-release-flexible-work-demand-grows/>.
- García-Ayllón, S. and P. Kyriakidis, P. (2022), “Spatial analysis of environmental impacts linked to changes in urban mobility patterns during COVID-19: Lessons learned from the Cartagena case study”, *Land*, Vol. 11/1, <https://doi.org/10.3390/land11010081>.
- Garrote Sanchez, D. et al. (2020), “Who on Earth Can Work from Home?”, World Bank Policy Research Working Papers, No. 9347, <http://documents.worldbank.org/curated/en/225881596202941026/Who-on-Earth-Can-Work-from-Home>.
- Geerts, E. (2022), “German 9-euro ticket successor is a fact: launch next year”, RailTech, www.railtech.com/policy/2022/10/18/german-9-euro-ticket-successor-is-a-fact-launch-next-year.
- Gilligan, M. (2021), “Calgary Transit fares increasing in January 2022”, CTV News, <https://calgary.ctvnews.ca/calgary-transit-fares-increasing-in-january-2022-1.5695631>.

- Goel, R. et al. (2021), “Cycling behaviour in 17 countries across 6 continents: levels of cycling, who cycles, for what purpose, and how far?”, *Transport Reviews*, Vol. 42/1, pp. 58-81, <https://doi.org/10.1080/01441647.2021.1915898>.
- Google LLC (2022), “COVID-19 Community Mobility Reports”, www.google.com/covid19/mobility (accessed 15 September 2022).
- Government of Austria (2021), “Climate Ticket”, www.oesterreich.gv.at/en/themen/bauen_wohnen_und_umwelt/klimaschutz/klimaticket.html.
- Infrastructure Canada (2022), “Investing in COVID-19 Community Resilience”, www.infrastructure.gc.ca/plan/covid-19-resilience-eng.html.
- Hadei, M. et al. (2021), “Effect of short-term exposure to air pollution on COVID-19 mortality and morbidity in Iranian cities”, *Journal of Environmental Health Science and Engineering*, Vol. 19/3, pp. 1807-16, <https://doi.org/10.1007/s40201-021-00736-4>.
- Heinen, E. and K. Chatterjee (2015), “The same mode again? An exploration of mode choice variability in Great Britain using the National Travel Survey”, *Transportation Research Part A: Policy and Practice*, Vol. 78, pp. 266-82, <https://doi.org/10.1016/J.TRA.2015.05.015>.
- Huwe, V. (2021), “Whose Streets? Justice in Transport Decarbonization and Gender”, Institute for Socio-Economics Working Papers, No. 13, www.econstor.eu/handle/10419/235477.
- ILO (2022), *World Social Protection Report 2020-22*, International Labour Organization, Geneva, www.ilo.org/global/research/global-reports/world-social-security-report/2020-22/lang--en/index.htm.
- INEGI and UNAM (2017), “Encuesta Origen-Destino en Hogares de la Zona Metropolitana del Valle de México” [Origin Destination Survey in Households of the Metropolitan Area of the Valley of Mexico], Instituto Nacional de Estadística, Geografía e Informática, www.inegi.org.mx/programas/eod/2017/.
- infas Institute for Applied Social Sciences (2022), “Wir erforschen das Klimaticket – gemeinsam mit Ihnen” [We research the Climate Ticket: together with you], www.infas.at/klimaticket.
- Isono, I. (2022), “COVID-19, Telework Patterns Within a City, and Changes in Urban Structure: Preliminary Findings”, Economic Research Institute for ASEAN and East Asia Discussion Paper Series, No. 430, www.eria.org/publications/covid-19-telework-patterns-within-a-city-and-changes-in-urban-structure-preliminary-findings/.
- ITDP (2021), “Walking and Cycling in COVID Times”, Institute for Transportation and Development Policy, www.itdp.org/wp-content/uploads/2021/06/ITDP_S32_Walking_and_Cycling_in_COVID_Times.pdf.
- ITDP (19 April 2022), “From commuter to care: Public transport’s role in creating the new normal”, Institute for Transportation and Development Policy, www.itdp.org/2022/04/19/from-commuter-to-care-public-transport-role-in-creating-the-new-normal.
- ITF (2022), “Streets That Fit: Re-allocating Space for Better Cities”, International Transport Forum Policy Papers, No. 100, OECD Publishing, Paris, <https://doi.org/10.1787/5593d3e2-en>.
- ITF (2021a), *Travel Transitions: How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends*, ITF Research Report, OECD Publishing, Paris, <https://doi.org/10.1787/9a83c2f7-en>.
- ITF (2021b), “Big Data for Travel Demand Modelling: Summary and Conclusions”, ITF Roundtable Reports, No. 186, OECD Publishing, Paris, <https://doi.org/10.1787/08378837-en>.

- ITF (2021c), *ITF Transport Outlook 2021*, OECD Publishing, Paris, <https://doi.org/10.1787/16826A30-EN>.
- ITF (2018), “Women’s Safety and Security: A Public Transport Priority”, OECD Publishing, Paris, www.itf-oecd.org/womens-safety-security.
- Jamal, S., S. Chowdhury and K.B. Newbold (2022), “Transport preferences and dilemmas in the post-lockdown (COVID-19) period: Findings from a qualitative study of young commuters in Dhaka, Bangladesh”, *Case Studies on Transport Policy*, Vol. 10/1, pp. 406-16, <https://doi.org/10.1016/J.CSTP.2022.01.001>.
- Jayanetti, C. (2022), “More than 100 bus routes in England face cuts and cancellations”, *The Guardian*, www.theguardian.com/uk-news/2022/jul/02/more-than-100-bus-routes-in-england-face-cuts-and-cancellations.
- Joshi, R. et al. (2021), “Post-COVID-19 Mobility: Key levers to reform urban transport systems”, High Volume Transport Applied Research Programme, New Delhi, <https://smartnet.niua.org/content/f86a2bb5-14e8-48f2-a553-c634bd8c2df5>.
- Kalmeiher, S. et al. (2017), “Health economic assessment tool (HEAT) for walking and for cycling”, World Health Organization, Geneva, [www.who.int/publications/i/item/health-economic-assessment-tool-\(heat\)-for-walking-and-for-cycling](http://www.who.int/publications/i/item/health-economic-assessment-tool-(heat)-for-walking-and-for-cycling).
- Kar, A. et al. (2022), “Public transit cuts during COVID-19 compound social vulnerability in 22 US cities”, *Transportation Research Part D: Transport and Environment*, Vol. 110, 103435, <https://doi.org/10.1016/j.trd.2022.103435>.
- Kraus, S. and N. Koch (2021), “Provisional COVID-19 infrastructure induces large, rapid increases in cycling”, *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 118/15, <https://doi.org/10.1073/PNAS.2024399118>.
- Kumar, A., S. Zimmerman and F. Arroyo-Arroyo (2021), “Myths and Realities of ‘Informal’ Public Transport in Developing Countries: Approaches for Improving the Sector”, World Bank Group, <https://openknowledge.worldbank.org/handle/10986/37083>.
- Lagadic, M. (2022), “Cycling for all? A feminist analysis of the Tokyo Bicycle Utilisation Promotion strategy”, Fondation France-Japon De L’ehess Discussion Papers, No. 22–02, <https://hal.archives-ouvertes.fr/hal-03683676>.
- Laker, L. (2022), “All aboard! How on demand public transport is getting back on the road”, *The Guardian*, www.theguardian.com/technology/2022/aug/11/all-aboard-how-on-demand-public-transport-is-getting-back-on-the-road.
- Lee, J., F. Baig and A. Pervez (2021), “Impacts of COVID-19 on individuals’ mobility behavior in Pakistan based on self-reported responses”, *Journal of Transport and Health*, Vol. 22, <https://doi.org/10.1016/j.jth.2021.101228>.
- Litman, T. (2022), “Local Funding Options for Public Transportation”, Victoria Transport Policy Institute, www.vtpi.org/tranfund.pdf.
- Loder, A. et al. (2022), “A nation-wide experiment: Fuel tax cuts and almost free public transport for three months in germany, Report 3, second wave results”, arXiv, <https://arxiv.org/pdf/2208.14902.pdf>.

- Lyons, G. and C. Davidson (2016), “Guidance for transport planning and policymaking in the face of an uncertain future”, *Transportation Research Part A: Policy and Practice*, Vol. 88, pp. 104-16, <https://doi.org/10.1016/J.TRA.2016.03.012>.
- Mairie de Paris (2021), “Un nouveau plan vélo pour une ville 100 % cyclable” [A new cycle plan for a 100% cyclable city], www.paris.fr/pages/un-nouveau-plan-velo-pour-une-ville-100-cyclable-19554.
- Marcus, J. (2020), “Remote workers are decamping to small cities during the pandemic”, National Public Radio, www.npr.org/2020/11/16/931400786/small-cities-are-a-big-draw-for-remote-workers-during-the-pandemic.
- Marsden, G. and I. Docherty (2021), “Mega-disruptions and policy change: Lessons from the mobility sector in response to the Covid-19 pandemic in the UK”, *Transport Policy*, Vol. 110, pp. 86-97, <https://doi.org/10.1016/j.tranpol.2021.05.015>.
- Mayor of London (2022), “Mayor outlines details of TfL fare changes from March 2022”, Press Release, www.london.gov.uk/press-releases/mayoral/fares-on-tfl-services-will-rise-by-48-per-cent.
- McKinsey and Company (2021), “Urban Transportation Systems of 25 Global Cities”, www.mckinsey.com/capabilities/operations/our-insights/building-a-transport-system-that-works-five-insights-from-our-25-city-report.
- Mogaji, E. (2022a), “Understanding travel behaviour post-Covid in Nigeria”, Presentation at the ITF Roundtable, “Shaping Post-Covid Mobility in Cities”, 8 June 2022, <https://youtu.be/VXyleNbHsh4>.
- Mogaji, E. (2022b), “Wishful thinking? Addressing the long-term implications of COVID-19 for transport in Nigeria”, *Transportation Research Part D: Transport and Environment*, Vol. 105, 103206, <https://doi.org/10.1016/j.trd.2022.103206>.
- Mogaji, E. (2020), “Impact of COVID-19 on transportation in Lagos, Nigeria”, *Transportation Research Interdisciplinary Perspectives*, Vol. 6, 100154, <https://doi.org/10.1016/J.TRIP.2020.100154>.
- Mogaji, E. et al. (2022), “Dealing with impact of COVID-19 on transportation in a developing country: Insights and policy recommendations”, *Transport Policy*, Vol. 116, pp. 304-14, <https://doi.org/10.1016/j.tranpol.2021.12.002>.
- Molla, R. (2021), “Remote work is bringing the city to the suburbs”, Vox, www.vox.com/recode/22714777/remote-work-from-home-city-suburbs-housing-traffic.
- Muro, M. et al. (2021), “Remote work won’t save the heartland”, Brookings, www.brookings.edu/blog/the-avenue/2021/06/24/remote-work-wont-save-the-heartland.
- NABSA (2021), “2021 Shared Micromobility State of the Industry Report”, North American Bikeshare and Scootershare Association, <https://nabsa.net/about/industry>.
- Napalang, S. (2022), “Shifting gears in the new normal: The Philippine experience”, Presentation at the ITF Roundtable, “Shaping Post-Covid Mobility in Cities”, 9 June 2022, <https://youtu.be/cxCENSgB9pE>.
- Nwosu, C.O., U. Kollampambil and A. Oyenubi (2022), “Socio-economic inequalities in ability to work from home during the coronavirus pandemic”, *Economic and Labour Relations Review*, Vol. 33/2, pp. 290-307, <https://doi.org/10.1177/10353046221085598>.
- O’Sullivan, F. (2021), “Paris will keep its Covid-era cafe terraces”, Bloomberg, www.bloomberg.com/news/articles/2021-06-15/paris-will-keep-its-covid-era-cafe-terraces.

- OECD (2023), *Brick by Brick: Building Better Housing Policies*, Volume 2, OECD Publishing, Paris, forthcoming.
- OECD (2022), “Austria’s ‘KlimaTicket’ to promote low-carbon mobility”, International Programme for Action on Climate, Policies in Practice, www.oecd.org/climate-action/ipac/practices/austria-s-klimaticket-to-promote-low-carbon-mobility-408c8de9.
- OECD (2021), “Teleworking in the COVID-19 pandemic: Trends and prospects”, OECD Policy Responses to Coronavirus (COVID-19), www.oecd.org/coronavirus/policy-responses/teleworking-in-the-covid-19-pandemic-trends-and-prospects-72a416b6.
- OECD (2020a), “Cities Policy Responses”, OECD Policy Responses to Coronavirus (COVID-19), www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff.
- OECD (2020b), “The Territorial Impact of COVID-19: Managing the Crisis across Levels of Government”, OECD Policy Responses to Coronavirus (COVID-19), www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-and-recovery-across-levels-of-government-a2c6abaf.
- Our World in Data (2022), “COVID-19 Data Explorer”, <https://ourworldindata.org/coronavirus>.
- Palm, M.D. (2022), “North American transportation during COVID-19: What really changed?”, *Transport and Pandemic Experiences (Transport and Sustainability)*, Vol. 17, pp. 55-75, <https://doi.org/10.1108/S2044-994120220000017004>.
- Pappas, S. (2022), “With traffic deaths on the rise, psychologists are being called on to make driving safer”, *Monitor on Psychology*, Vol. 53/4, www.apa.org/monitor/2022/06/feature-traffic-safety.
- Pawar, D.S. et al. (2020), “Impact of physical distancing due to novel coronavirus (SARS-CoV-2) on daily travel for work during transition to lockdown”, *Transportation Research Interdisciplinary Perspectives*, Vol. 7, 100203, <https://doi.org/10.1016/J.TRIP.2020.100203>.
- Peters, H. et al. (2020), “COVID-19 SUMP Practitioner Briefing”, CIVITAS, Brussels, <http://civitas.eu/resources/covid-19-sump-practitioners-briefing>.
- Raker, C. (2021), “Cycling like a Dutchie? First, you have to pass their bike exam!”, *Dutch Review*, <https://dutchreview.com/culture/dutch-biking-exam>.
- Ramani, A. and N. Bloom (2021), “The donut effect of Covid-19 on cities”, National Bureau of Economic Research Working Paper Series, No. 28876, www.nber.org/papers/w28876.
- Ravalet, E., P. Rérat and V. Kaufmann (2017), “Immobilités et mobilités liées au télétravail. La situation en Suisse en 2015” [Immobility and mobility linked to telework: The situation in Switzerland in 2015], Presentation at the French Institute of Science and Technology for Transport, Development and Networks conference, “Work on the Move”, Marne-la-Vallée, 30 November 2017, <https://infoscience.epfl.ch/record/232618/usage>.
- Regidor, J.R.F. (2022), “Current state of transportation data and statistics in the Philippines and opportunities for improvement towards usability”, Paper presented at the 14th National Convention on Statistics, Quezcon City, the Phillipines, 1-3 October 2019, https://scholar.google.com.ph/citations?view_op=view_citation&hl=en&user=PDJLK_UAAAAJ&citation_for_view=PDJLK_UAAAAJ:isC4tDSrTZIC.
- Restle, B. (2022), “Germany’s 9-euro travel pass: Success or failure?”, *Deutsche Welle*, www.dw.com/en/germanys-9-euro-travel-ticket-success-or-failure/a-62329405.

- Reuters (2022), “New Zealand reduces fuel excise duty as petrol prices soar”, www.reuters.com/world/asia-pacific/new-zealand-reduces-fuel-excise-duty-petrol-prices-soar-2022-03-14.
- RFI (2022), “Germany agrees to replace cheap national transport ticket”, www.rfi.fr/en/business-and-tech/20221013-germany-agrees-to-replace-cheap-national-transport-ticket.
- Rode, P., C. Heeckt and N. da Cruz (2019), “National Transport Policy and Cities: Key policy interventions to drive compact and connected urban growth”, Coalition for Urban Transitions, <https://urbantransitions.global/en/publication/national-transport-policy-and-cities-key-policy-interventions-to-drive-compact-and-connected-urban-growth/>.
- Rupprecht Consult (2019), “Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan”, 2nd edition, European Platform on Sustainable Mobility Plans, www.eltis.org/mobility-plans/sump-guidelines.
- Safaricom (2021), “Safaricom adds 400 more Nairobi matatus to cashless fare”, www.safaricom.co.ke/media-center-landing/press-releases/safaricom-adds-400-more-nairobi-matatus-to-cashless-fare.
- Sato, A. and H. Dempster (2022), “COVID-19, Long-Term Care, and Migration in Asia”, Centre for Global Development Policy Papers, No. 260, www.cgdev.org/publication/covid-19-long-term-care-and-migration-asia.
- Schmidt, S. (2022), “The Unequal Geography of Covid’s ‘Open Streets’”, Bloomberg City Lab, www.bloomberg.com/news/articles/2022-01-03/the-unequal-geography-of-covid-s-open-streets.
- Schneider, R. J. (2013), “Theory of routine mode choice decisions: An operational framework to increase sustainable transportation”, *Transport Policy*, Vol. 25, pp. 128-37, <https://doi.org/10.1016/J.TRANPOL.2012.10.007>.
- Sehmi, G. S. (2020), “Three ways COVID-19 is reshaping how we collect and use data in transport”, World Bank Blogs, <https://blogs.worldbank.org/transport/three-ways-covid-19-reshaping-how-we-collect-and-use-data-transport>.
- Shah, S., R. Rajiv and A. Lokre (2021), “Moving towards gender equitable public transport in a post-COVID-19 world”, High Volume Transport Applied Research, <https://transport-links.com/download/final-report-moving-towards-gender-equitable-public-transport-operations-in-a-post-covid-19-world/>.
- Sidik, S.M. (2022), “How Covid has deepened inequality in six stark graphics”, *Nature*, Vol. 606, <https://doi.org/10.1038/d41586-022-01647-6>.
- Silberzahn, P. (2020), “Gérer une situation de crise: faut-il une approche centralisée ou décentralisée?” [Managing a crisis situation: Should a centralized or decentralized approach be taken?], Dirigeant, www.dirigeant.fr/points-de-vue/gerer-une-situation-de-crise-faut-il-une-approche-centralisee-ou-decentralisee.
- Sorenson, D. (2021), “Switching gears: Are we finally seeing a decline in bicycle sales?”, NPD Group, www.npd.com/news/blog/2021/switching-gears-are-we-finally-seeing-a-decline-in-bicycle-sales.
- Sorrell, S.R. (2022), “Do teleworkers travel less? The challenge of tele-sprawl”, Centre for Research into Energy Demand Solutions, www.creds.ac.uk/do-teleworkers-travel-less-the-challenge-of-tele-sprawl.

- Statistics Canada (2019), “Results from the 2016 Census: Commuting within Canada’s largest cities”, <https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00008-eng.htm>.
- TfL, “Getting more people walking and cycling could help save our high streets”, Transport for London, <https://tfl.gov.uk/info-for/media/press-releases/2018/november/getting-more-people-walking-and-cycling-could-help-save-our-high-streets>.
- Topham, G. (2022), “TfL funding deal means tube fares must rise and bus services be cut”, *The Guardian*, www.theguardian.com/uk-news/2022/aug/30/tfl-funding-deal-means-tube-fares-must-rise-and-bus-services-be-cut.
- TransitCenter (2022), “Bus operators in crisis: The steady deterioration of one of transit’s most essential jobs, and how agencies can turn things around”, <https://transitcenter.org/bus-operators-in-crisis-charts-the-deterioration-of-one-of-transits-most-essential-jobs-and-shows-how-agencies-can-turn-things-around>.
- TransitCenter (2020a), “Tailoring transit service for essential workers is a matter of racial justice”, <https://transitcenter.org/tailoring-transit-service-for-essential-workers-is-a-matter-of-racial-justice>.
- TransitCenter (2020b), “Transit is essential: 2.8 million U.S. essential workers ride transit to their jobs”, <https://transitcenter.org/2-8-million-u-s-essential-workers-ride-transit-to-their-jobs>.
- Transport for NSW (2021), “Household Travel Survey (HTS) – Data by Region (2020/21)”, www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-hts.
- Transport for NSW (2020), “Household Travel Survey (HTS) - Data by Region (2009/10-2019/20)”, www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-0.
- Tridemy, L. (2022), “Exploring the actions able to influence new mobility patterns”, Presentation at the ITF Roundtable, “Shaping Post-Covid Mobility in Cities”, 10 June 2022, <https://youtu.be/8oWQvoiY9Xk>.
- Tsavadari, D. et al. (2022), “The anticipated use of public transport in the post-pandemic era: Insights from an academic community in Thessaloniki, Greece”, *Social Sciences*, Vol. 11/9, <https://doi.org/10.3390/socsci11090400>.
- UCLG, Metropolis and LSE Cities (2020), “The COVID-19 Response: Governance Challenges And Innovations By Cities And Regions”, Emergency Governance Initiative Analytics Notes, No. 2, www.lse.ac.uk/Cities/publications/Policy-Briefs-and-Analytics-Notes/Analytics-Note-02-The-COVID-19-Response-Governance-Challenges-and-Innovations-by-Cities-and-Regions.
- UITP (2022), “Managing the demand for mobility: A transformational policy instrument”, Union Internationale des Transports Publics Policy Brief, www.uitp.org/publications/managing-demand-for-mobility-transformational-policy-instrument/.
- UITP (2021a), “Preparing for a better future: How transport authorities have managed the crisis”, Union Internationale des Transports Publics Knowledge Brief, www.uitp.org/publications/preparing-for-a-better-future-how-transport-authorities-have-managed-the-crisis/.
- UITP (2021b), “Win back passengers: facts, figures and the new normal”, Union Internationale des Transports Publics, www.uitp.org/publications/win-back-passengers-facts-figures-and-the-new-normal/.

- UITP (2020), “Covid-19 pandemic: Resuming public transport services post-lockdown”, Union Internationale des Transports Publics Knowledge Brief, www.uitp.org/publications/covid-19-pandemic-resuming-public-transport-services-post-lockdown/.
- UK Office for National Statistics (2020), “Does exposure to air pollution increase the risk of dying from the coronavirus (COVID-19)?”, www.ons.gov.uk/economy/environmentalaccounts/articles/doesexposuretoairpollutionincreasetheriskofdyingfromthecoronaviruscovid19/2020-08-13.
- UN Habitat (2021), “Cities and Pandemics: Towards a More Just, Green and Healthy Future”, <https://unhabitat.org/cities-and-pandemics-towards-a-more-just-green-and-healthy-future-0>, United Nations Human Settlements Programme, Nairobi.
- UN Habitat (2020), “Africa: How Urban Mobility Can Come Back Stronger in a Post-Pandemic World”, <https://unhabitat.org/africa-how-urban-mobility-can-come-back-stronger-in-a-post-pandemic-world>, United Nations Human Settlements Programme, Nairobi.
- UN Women (2020), “COVID-19 and Ensuring Safe Transport with and for Women and Girls”, www.unwomen.org/en/digital-library/publications/2020/12/brief-covid-19-and-ensuring-safe-transport-with-and-for-women-and-girls.
- US Bureau of Transportation Statistics (2022), “Daily travel during the COVID-19 public health emergency”, www.bts.gov/daily-travel.
- US DOT (2018), “Summary of Travel Trends: 2017 National Household Travel Survey”, US Department of Transportation, Federal Highway Administration, <https://nhts.ornl.gov>.
- Viana Cerqueira, E. et al. (2020), “Does working from home reduce CO2 emissions? An analysis of travel patterns as dictated by workplaces”, *Transportation Research Part D: Transport and Environment*, Vol. 83, <https://doi.org/10.1016/j.trd.2020.102338>.
- Ville de Paris (2021), “Une réforme des étalages et terrasses à Paris : on vous explique tout !” [A reform of displays and terraces in Paris: we explain everything to you!], <https://cdn.paris.fr/paris/2021/06/09/99ab49c815fda65d425dbcc359f63c9e.pdf>.
- Waka Kotahi New Zealand Transport Agency (2022a), “Half price public transport fares”, www.nzta.govt.nz/about-us/transport-temporary-relief-package/half-price-public-transport-fares.
- Waka Kotahi New Zealand Transport Agency (2022b), “Waka Kotahi COVID-19 transport impact: Fieldwork waves 1-27 core report”, www.nzta.govt.nz/assets/resources/covid-19-impacts-on-transport/waka-kotahi-nzta-covid-19-transport-impact-wave-27-20220318.pdf.
- Waka Kotahi New Zealand Transport Agency (2022c), “Waka Kotahi COVID-19 transport impact: Fieldwork waves 1-28 core report”, www.nzta.govt.nz/assets/resources/covid-19-impacts-on-transport/waka-kotahi-nzta-covid-19-transport-impact-wave-28-20220614.pdf.
- WhereIsMyTransport (2022), “Mapping of formal and informal transport in Mexico City”, www.wheremytransport.com.
- White, P. et al. (2007), “The role of teleworking in Britain: its implications for the transport system and economic evaluation”, Proceedings of the European Transport Conference, 17-19 October 2007, Leiden, the Netherlands, <https://westminsterresearch.westminster.ac.uk/item/920v6/the-role-of-teleworking-in-britain-its-implications-for-the-transport-system-and-economic-evaluation>.

REFERENCES

- WHO (2022), “Monkeypox, COVID-19 and Other Global Health Issues”, Virtual press conference, 22 September 2022, www.who.int/multi-media/details/monkeypox--covid-19---other-global-health-issues-virtual-press-conference---22-september-2022.
- Woodhouse, S. (2022), “Public transportation braces for fewer commuters amid work from home”, Bloomberg CityLab, www.bloomberg.com/news/articles/2022-06-16/public-transportation-braces-for-fewer-commuters-amid-work-from-home.
- Wu, X. et al. (2020), “Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis”, *Science Advances*, Vol. 6/45, <https://doi.org/10.1126/SCIADV.ABD4049>.
- Yap, J. (2022), “Policies to increase multimodality post-pandemic”, Presentation at the ITF Roundtable, “Shaping Post-Covid Mobility in Cities”, 9 June 2022, <https://youtu.be/ndjU8evNAGg>.
- Zahra, T. (2022), “‘A lot of times, they close the doors while people are getting on’: The need for gender responsive mobility planning”, The Citizen, www.thecitizen.in/index.php/en/NewsDetail/index/7/21464/A-Lot-of-Times-They-Close-the-Doors-while-People-are-Getting-on

Annex. List of Roundtable participants

Rhona GLAZER-MUNCK (Chair), Deputy Director, Head of Covid-19 Inquiry Response, Department for Transport (DfT), United Kingdom

Cristina ALBUQUERQUE, Urban Mobility Manager, World Resources Institute Brasil, Brazil

Jillian ANABLE, Professor of Transport and Energy, Institute for Transport Studies, University of Leeds, United Kingdom

Pauline AYMONIER, Head of Public Policy, Smart and Sustainable City, Tier Mobility, France

Geneviève BOISJOLY, Assistant Professor, Polytechnique Montréal, Canada

Dominique BOUQUET, Project Assistant, ITF

Peter COCKREM, Senior Policy Advisor, New Zealand Transport Agency, New Zealand

Clarisse COLONNA, Head of Strategy and Development, RATP Group, France

Emmanuel DOMMERGUES, Head of Unit, Union Internationale des Transports Publics (UITP), Belgium

Anne-Cécile DUBOYS FRESNEY, Strategy Manager, RATP Group, France

Jagoda EGELAND, Advisor to the Secretary-General, ITF

Malithi FERNANDO, Policy Analyst, ITF

Mike FORREST, Head of Pandemic Resilience Strategy, DfT, United Kingdom

Daisuke FUKUDA, Professor, University of Tokyo, Japan

Peter GRIFFITHS, Thought Leadership and Content Lead, Tier Mobility, United Kingdom

Marije HAMERSM, Researcher, KiM Netherlands Institute for Transport Policy Analysis, the Netherlands

Mohamed HEGAZY, Director, Transport for Cairo, Egypt

Rutul JOSHI, Associate Professor, Faculty of Planning, CEPT University, India

Layla KHALAF, Project Assistant, ITF

Young Tae KIM, Secretary-General, ITF

Willem KLUMPENHOUWER, Postdoctoral Fellow, University of Toronto, Canada

Anne-Laure LE MERRE, Senior Advisor EU Affairs, UITP

Julien LOKNAR, Policy Officer for Railway Safety and European Affairs, RATP Group, France

Manuela LÓPEZ MENÉNDEZ, Secretary of Transportation and Public Works, Buenos Aires City Government, Argentina

Greg MARSDEN, Professor of Transport Governance, University of Leeds, United Kingdom

Beatriz MELLA, Director, CIUDHAD Research Center, Universidad Andrés Bello, Chile

Emmanuel MOGAJI, Researcher, University of Greenwich, United Kingdom

Sheilah NAPALANG, Assistant Secretary, Planning and Project Development, Department of Transportation, the Philippines

Tanya O'GARRA, Senior Lecturer, Middlesex University, United Kingdom

Camilo PABÓN ALMANZA, Vice-Minister of Transport, Colombia

Matt PALM, Research Co-ordinator, University of Toronto Scarborough, Canada

Zuzana PÚČIKOVÁ, Director of EU Public Policy, Uber Technologies Inc., Belgium

María SANTOS ALFAGEME, Research Officer, ITF

Sonal SHAH, Executive Director, Centre for Sustainable and Equitable Cities, India

Alejandro TIRACHINI, Associate Professor, Universidad de Chile, Chile

Laurent TRIDEMY, Strategic Foresight Manager, Michelin, France

Shin-pei TSAY, Director of Global Policy, Cities and Transportation, Uber Technologies Inc., United States

Roger VAHNBERG, Senior Vice President, Deputy CEO, Västtrafik, Sweden

Owen WAYGOOD, Associate Professor, Polytechnique Montréal, Canada

Jeremy YAP, Deputy Chief Executive of Public Transport, Policy and Planning, Land Transport Authority, Singapore

Shaping Post-Covid Mobility in Cities

The Covid-19 pandemic has changed how people live and move, especially in urban environments. As many cities transition towards living with the virus, this presents challenges and opportunities to create more sustainable, resilient and equitable transport systems. This report explores how urban mobility changed during the pandemic, focusing on changes in how people work. Based on a review of international best practices, the report provides recommendations for better urban mobility in a post-Covid world.

International Transport Forum

2 rue André Pascal
F-75775 Paris Cedex 16
+33 (0)1 73 31 25 00
contact@itf-oecd.org
www.itf-oecd.org