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BETTER ACCESS TO URBAN OPPORTUNITIES:
ACCESSIBILITY POLICY FOR CITIES IN THE 2020S

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Tram route in Izmir, Turkey.
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ABOUT THIS WORKING PAPER

This paper was prepared by LSE Cities at the London School of Economics and Political Science, and the Organisation for Economic Co-operation and Development (OECD). It was supported by the Coalition for Urban Transitions, the leading global initiative helping national governments unlock the power of inclusive, zero-carbon cities. The opinions expressed and arguments employed are those of the authors.

Executive summary

The world has entered the 2020s facing three intertwined crises that demand immediate attention: the COVID-19 pandemic, a new rise in poverty and inequality and the climate emergency. The urgency is particularly great in cities, where people and economic activities are concentrated. This calls for a critical rethinking of whether urban areas are meeting people's needs – and how policies could help transform them for the better.

The **pandemic** has highlighted both the vulnerabilities and the resilience of densely populated cities. Ensuring that people can efficiently access jobs, educational opportunities, services and other resources will be crucial to a successful recovery.

The rise in **poverty and inequality** has shown how cities can facilitate social mobility or deepen the gaps between rich and poor. Urban economic development needs to be more socially just and provide equitable access to jobs, services and other opportunities.

The **climate emergency** demands urgent action to reduce greenhouse gas (GHG) emissions. A key priority is to decarbonise urban mobility by reducing car dependency, which requires realigning transport investments and adopting complementary housing and land use policies.

A common thread is **urban accessibility** – the need to ensure that people can not only move around efficiently, but actually get to everything they need to thrive. Local governments will lead much of the work to achieve this, but to succeed, they need strong national-level support. National governments often define what is possible, through everything from building codes to infrastructure investments, and can accelerate or stifle urban transformation.

This paper focuses on **key near-term opportunities for national governments** to improve urban accessibility through policies and investments that help cities become more compact, connected, clean and inclusive. This is a pivotal time, with the world's post-COVID trajectory still to be determined and trillions of dollars being invested in economic recovery packages. Governments can put urban areas on the path to low-carbon, truly inclusive accessibility, or they can further entrench carbon-intensive economic systems and "business as usual".

Three key insights drive the analysis in this paper:

1. **The primary function of cities is to connect people with one another and with opportunities, resources, goods and services.** When cities do this well, they are powerful engines for economic development and social progress. Effective urban access can also translate into resource and energy efficiencies that boost prosperity while reducing GHG emissions. In practice, however, far more needs to be done to realise this potential, and access to opportunities remains unequally distributed across and within cities.

2. **Transport policy is crucial to urban accessibility, but it is only one of several key elements.** Policy-makers often focus on urban mobility: the ease of movement of people and goods. This is determined by transport policies and investment priorities – whether they favour car use or walking, cycling and public transport, and whether they privilege some areas over others, or serve all equitably. From an accessibility perspective, however, it is just as important to consider how land is used and managed, and how economic activities, services and amenities are distributed. Digital technologies can be used to bridge gaps. At the same time, social norms and differences in people's economic means, abilities and technical capacities will affect their access to urban opportunities.

3. **Reshaping cities to be compact, connected, clean and inclusive will not only make them more accessible, but also more liveable, resilient and sustainable.** The pandemic has highlighted the need for mixed-use urban districts where people of all incomes and social statuses can live, work, study, shop and socialise without traveling long distances. Many people found their housing did not meet their needs, and few services or amenities were available within walking distance. At the same time, teleworking continues to be widespread, calling into question the future of business districts. Investments that make cities more accessible without the need to drive can reduce GHG emissions, improve people's quality of life and enable communities to better withstand any future crisis.

THE OPPORTUNITY: SEIZING THE MOMENT TO IMPROVE URBAN ACCESSIBILITY

The pandemic has shown that people can quickly and dramatically change how they live and work, and many are loath to return to "business as usual". COVID-19 has been economically and socially devastating, but it has also provided glimpses of a different, potentially brighter future. Millions of workers were freed from arduous commutes; traffic congestion eased significantly; the air was cleaner; urban street space was reclaimed for outdoor dining, community activities, walking and cycling; and a wealth of opportunities became available online. The experience, combined with a heightened sense of urgency about climate change, has created a desire to "build back better" post-COVID. This is a unique window of opportunity to take bold, ambitious action for urban accessibility.

COVID-19 recovery packages include massive investments with the potential to start to transform cities. We looked at nine countries – China, Colombia, Germany, Japan, Mexico, South Africa, South Korea, the United Kingdom and the United States – and found many promising measures, including support for rail networks, urban public transport systems, electric vehicles (EVs), walking and cycling infrastructure and low-traffic neighbourhoods. Major investments are also being made in housing construction and upgrades. Though large amounts of funds

have gone to preventing harm rather than making improvements (e.g. aiding cash-strapped transit agencies, helping low-income renters avoid eviction), some of this spending has already made a visible difference in cities. Given how large these recovery packages are relative to governments' typical spending, it is crucial to use the money wisely.

In many cities, changes brought about by the pandemic create opportunities to rethink the use of space and further improve accessibility. For instance, demand for office and retail spaces in business districts may never fully recover, which opens up the possibility of accelerating the shift towards more flexible, modular and multi-purpose infrastructure to meet citizen demand and minimise investment needs. This could include actions to reclaim public space, convert vacant offices, repurpose buildings or turn parking lots into green spaces or other amenities. There is also a new appreciation of digital connectivity and its potential to connect people to one another and to key resources and services. Investments in key technologies and infrastructure (5G networks, big data, artificial intelligence) and the digitalisation of public services hold enormous promise. An urgent priority is to bridge the digital divide, so all urban dwellers can benefit.

THE NEW RISK: LOSING IMPORTANT GAINS IN URBAN ACCESSIBILITY

Around the world, COVID-19 has disproportionately affected cities, disrupting socio-economic development. Though over time, the virus spread more evenly across countries, over 90% of confirmed cases were initially estimated to come from urban areas. Billions of city dwellers were asked or ordered to stay home, offices and many institutions shut down, and hospitality and retail businesses saw record reductions in customers. Even today, even in countries with high vaccination rates, life is not back to normal. It is clear that the pandemic will have far-reaching consequences for urban employers, workers and entire communities. To the extent that public and private budgets alike are more constrained, these impacts could also delay critical actions to ensure a low-carbon and climate-resilient future.

The transport sector faces particular, immediate challenges, as public transport ridership has dropped, and more people are choosing to drive. If this pattern holds, it could increase GHG emissions, air pollution and congestion and encourage further car-centric urban development. The risk is greater if, facing significant revenue losses and increased operating costs, public transport agencies reduce the frequency and quality of service, as some have. If public confidence is not restored and revenue losses are not offset through other finance, it could lead to a death spiral for public transport.

Anti-urban sentiments have proliferated, fuelled by a backlash against dense urban environments seen as increasing infection risks. Though low-income people living in crowded and substandard conditions were, indeed, particularly vulnerable to the pandemic, there is no evidence that urban density inherently increased COVID risk. Still, many people perceived cities as less safe. With the urban advantages of access to culture and economic opportunities reduced by the pandemic or offset by digital connectivity, some were drawn to suburban or rural areas, looking for larger homes, private green spaces and access to nature. Should this pattern hold, it could jeopardise progress towards more compact and connected development, as well as targets for biodiversity and the preservation of open land and forests.

The pandemic could also exacerbate inequality, reducing the resilience of urban societies and their economies. Job losses due to lockdowns and public health restrictions disproportionately affected lower-paid workers in the retail and hospitality sectors. If urban business districts do not return to full occupancy, that will have knock-on effects for the entire urban labour market. Inadequate housing has added to many families' challenges, with remote workers forced to use unsuitable spaces, often sharing rooms with other adults or with children attending school remotely. Housing insecurity is another serious concern, as many people could not keep up with rent or mortgage payments during the COVID crisis. This could push many lower-income households out of cities and into cheaper homes in the urban periphery, with less access to economic and other opportunities.

Carbon-intensive COVID-19 recovery efforts are pushing economies in the wrong direction. Despite many positive steps, on balance, pandemic recovery policies and investments are undermining climate and sustainable development targets more than supporting them. Vivid Economics' Greenness of Stimulus Index shows that of the US$17.2 trillion in emergency response and recovery packages adopted as of June 2021 in the G20 and 10 additional countries, 28% went to environmentally sensitive sectors (energy, transport and waste – the most relevant to urban emissions – as well as industry and agriculture). In 15 of the G20 economies and half the other countries, the analysis found, those investments would have a net negative environmental impact, helping entrench fossil fuel dependency and "business as usual" practices.

Many pandemic recovery policies and investments could hinder a transition to compact, connected, clean and inclusive cities. For example, massive housing construction programmes could exacerbate urban sprawl if they are not guided by careful land use planning. Some governments have simplified construction permitting requirements, relaxed measures to reduce traffic congestion and allowed older, more polluting buses and taxis to stay on the road longer instead of being replaced. Even some "green" measures could be counterproductive if they are kept in place for a longer time. For instance, tax breaks for purchasing alternative fuel or hybrid vehicles could reinforce car dependency and keep people from using public transport instead.

TAKING ACTION: PRIORITIES FOR NATIONAL POLICY-MAKERS

It is not too late for national governments to include measures to improve urban accessibility – and make cities become more compact, connected, clean and inclusive – in their COVID-19 recovery packages. They can also seize opportunities that arise in fiscal, economic and sectoral policies or in infrastructure budgets. Six policy areas merit particular attention:

1. **Realigning national transport policies and budgets:** National governments play a central role in shaping urban mobility patterns and are major funders of both high- and low-carbon transport infrastructure. Many COVID-19 stimulus and recovery packages have also included significant transport investments. Governments should seize these opportunities to promote transformative change. Priorities include expanding established sustainable travel, such as walking, cycling and public transport use; rapidly electrifying road transport; and, to the extent that cars are used, shifting away from individual ownership and towards sharing and pooling.

2. **Comprehensive housing and land use policy reform:** Housing investments are critical to addressing the economic and social crisis brought about by COVID-19. To achieve this, they need to be part of a broader urban and social policy strategy. Governments should focus not only on housing construction, but on building communities and neighbourhoods where residents can access the opportunities, services and amenities they need to thrive. It is important to provide a wide array of options, including both homeownership and rentals, to suit people at different income levels and in different life situations. National policy-makers must also ensure that decisions on where to build homes are based on true costs to society, and stop providing direct or indirect subsidies for dispersed urban development.

3. **Hyper-localisation and the 15-minute neighbourhood:** From Paris to Seattle to Melbourne, a growing number of cities are embracing a model of radical accessibility that aims to bring as many land uses as possible into a single area. The goal is for all city residents to be able to meet most daily needs within a short walk or bike ride (and/or public transit trip) from home. This, in turn, requires ensuring that urban services and opportunities are available all across the city. Realising this vision is likely to require land use policy reforms to allow denser development, including multi-family housing and rentals, and a focus on ensuring that investment in improved services is not concentrated in already affluent areas. It will also require rethinking public and active transport planning, moving from a "hub and spoke" model to polycentric cities with connections across neighbourhoods.

4. **New urban mobility and last-mile connectivity:** Two trends are rapidly transforming urban mobility: micromobility solutions such as bike-sharing and e-scooters, and ride- and car-sharing. Though micromobility growth slowed at the peak of the pandemic, it is expected to play a key role in enabling first- and last-mile connectivity in multimodal and car-free transport systems. Regulation and engagement with service providers will be needed to maximise benefits to urban communities. Ride-sharing services in particular may compete with public transit and increase congestion in some areas, but they can still improve urban accessibility in places underserved by public transport, and also make it easier to forgo car ownership. Integration with other transport modes will be key.

5. **Reallocation of road space and tactical urbanism:** The pandemic led to the rapid reorganisation of urban street space, as sidewalks were widened, roads were pedestrianised and pop-up cycling lanes emerged almost overnight to accommodate the urgent need for social distancing. This huge global experiment in "tactical urbanism" proved to be a powerful tool for governments to push back against the dominance of cars. There is now a window of opportunity to make these physical and behavioural changes permanent and ensure that they are integrated into strategies for more sustainable urban and transport planning. Support from national governments will be critical in scaling up these early successes.

6. **New finance for metropolitan-wide transport:** Public transport plays a particularly critical role in large metropolitan areas, ensuring accessibility and reducing the need to drive. Investing in metropolitan-wide public transport is an urgent priority given the drop in ridership and revenues caused by the pandemic. It is also essential from an equity perspective, as in many cities it is the main mode through which lower-income residents are able to access jobs, education and core services. In addition, high-quality public transport can help mitigate the negative effects of urban sprawl by facilitating movement within and between peripheral neighbourhoods and into core employment centres.

Along with these policy priorities, national policy-makers need to recognise two "blind spots" in urban accessibility debates and leverage their transformative potential:

7. **Digital connectivity:** Digital technologies can be major enablers of social and economic development, enhancing access to urban resources while reducing the need to travel – which, in turn, can reduce GHG emissions from transport. However, digital connectivity in much of the world remains deeply inequitable. National governments need to treat digital connectivity as an integrated component of urban accessibility policy. This means putting equitable virtualisation requirements and opportunities on par with physical transport infrastructure, so they can truly be alternatives to physical mobility. Policy priorities include incorporating digital connectivity requirements

as part of urban planning and building regulations, incentives to bridge the digital divide, direct investments in and delivery of digital connectivity through the public sector and enabling new finance, such as universal service funds.

8. **Urban freight and logistics:** Urban freight transport has been growing at an exponential rate across the world, with demand for last-mile deliveries expected to grow by 78% over the next decade. Yet few cities have dedicated expertise to help them manage urban freight's impacts on sustainability and liveability. The issue also gets little attention in national policy-making, leading to a fragmented regulatory environment both within and across countries. Promoting sustainable freight solutions suited to dense urban environments should be a critical aspect of urban transport planning – a task for national and local governments to tackle together. Priorities include integrating freight and logistics planning into transport and land use plans; investing in and incentivising the use of urban consolidation centres; facilitating the sharing of data and best practices; and providing preferential access for low-emission freight vehicles.

The confluence of COVID-19, the poverty and inequality crisis and the climate emergency poses enormous challenges. This paper makes the case for a near-term urban investment and policy agenda that prioritises urban accessibility – both to seize immediate opportunities and to protect hard-won gains that have been imperilled by the pandemic. Local governments are already taking the initiative, but to realise the potential of compact, connected, clean and inclusive urban development, they need strong national-level support.

Though some countries have made important investments in urban accessibility, some investments and policy choices could actually set countries back. But it is not too late to act: by the opportunities laid out above, helping steer market forces in the right direction and supporting the transformative work being done by local governments, national leaders can make a significant contribution both to climate action and to urban accessibility.

1. Introduction

The world has entered the 2020s facing three intertwined crises that demand immediate attention: the COVID-19 pandemic, a new rise in poverty and inequality and the climate emergency. The urgency is particularly great in cities, where people and economic activities are concentrated, requiring a critical rethinking of whether urban areas are meeting people's needs – and how policies could help transform them for the better.

The **pandemic** has highlighted both the vulnerability of densely populated cities to infectious disease and the resilience of compact and connected urban areas. Ensuring that people can efficiently access jobs, educational opportunities, services and other resources will be crucial to a successful recovery.

The rise in **poverty and inequality** has highlighted how cities can facilitate social mobility or deepen the gaps between rich and poor. Improving the connections between where people live and their daily destinations, while facilitating more equitable access to jobs, services and other urban opportunities, can help ensure that urban economic development is more socially just.

The **climate emergency** requires particularly rapid and radical change in how we make our cities accessible. A priority is to decarbonise urban mobility by reducing car dependency. Before the pandemic, the transport sector produced 23% of global greenhouse gas (GHG) emissions,[1] and those emissions are projected to keep rising rapidly, making this a "make or break" sector for a safe planet. Transport is also particularly at risk of backtracking on recent gains. But transport cannot be rethought in isolation – to truly transform cities for the critical decade ahead, it is critical to link transport reforms to housing and wider land use policy as part of a holistic urban accessibility agenda.

The common thread is **urban accessibility**, which means ensuring that people can not only move around efficiently, but actually get to everything they need to thrive. Local governments have considerable control over transport and urban planning and will lead many of these efforts, but to succeed, they need strong national government support. National policies and budgets often define what is possible, through everything from building codes to infrastructure investments and can accelerate or stifle urban transformation.

This paper makes the case for national governments to make urban accessibility a policy priority. It starts by explaining why the 2020s are an inflection point for urban development and climate action. It then examines how prevailing national policies converge with or differ from progressive urban policy agendas, focusing on how national governments' COVID-19 recovery measures are enabling better access to urban opportunities – or inhibiting it. It then outlines policy priorities for urban accessibility in the 2020s, as put forward by pioneering cities, knowledge partners and experts, and identifies those that are particularly relevant for engagement by national level governments.

The paper has two main parts:

Part 1 reviews national-level recovery packages and new policies introduced in response to COVID-19, with a focus on urban accessibility, in nine case study countries: China, Colombia, Germany, Japan, Mexico, South Africa, South Korea, the United Kingdom and the United States. These countries were selected for their geographic diversity and overall significance in terms of economic output, population and climate action over the coming decade. Selecting OECD member countries also made it easier to obtain and verify comparable data.[2]

This analysis first looks at which countries have implemented specific actions, then assesses the extent to which existing policies and recovery measures either support or hinder urban accessibility using a "traffic light" rating system. It covers transport and infrastructure, housing and land use and urban governance. For each of these sectors, it also provides concrete examples of city-level interventions from around the world to complement the information on national-level action.

Part 2 presents policy priorities for urban accessibility that simultaneously address the climate emergency, foster greater equity and enable economic recovery in cities. It starts with six key areas for better urban accessibility, discussing how they serve as levers for radical decarbonisation: (1) national transport policies and investments; (2) comprehensive housing and land use policy reform; (3) hyper-localisation and "15-minute" districts; (4) new urban mobility and last-mile connectivity; (5) reallocation of road space and tactical urbanism; and (6) new finance for metropolitan-wide transport. For each policy area, it provides an overview of policy instruments and the degree to which they are particularly relevant for national level policy-making.

A second section presents two accessibility policy "blind spots" – digital connectivity and urban freight – that have yet to receive appropriate attention. Above all, governments at all levels risk ignoring their fundamental and critical contribution to integrated transport, land use and accessibility policies. To identify the most relevant policy instruments in each of these two domains, interviews and surveys with urban freight and digital connectivity experts were carried out to complement desktop research. The surveys were conducted between March and May 2021 and included 26 experts from seven countries for digital connectivity and 33 experts from 14 countries for urban freight.

2. The 2020s: An inflection point for cities and climate

The primary function of cities is to provide access to other people, opportunities, goods, services and ideas. This is why cities are so important for economic development and social progress. To the extent that this access also translates to resource and energy efficiencies, cities can play a unique role in achieving both greater prosperity and environmental sustainability. However, access to opportunities remains unequally distributed across and within cities – with particularly large inequalities and spatial segregation often occurring in the largest cities. Local governments need to understand and address such inequality through measures targeted to each city's specific conditions, aiming to leave no one behind.

THE OPPORTUNITY: SEIZING THE MOMENT TO IMPROVE URBAN ACCESSIBILITY

The importance of the early 2020s as an inflection point is hard to overstate. Countries are making enormous investments in economic stimulus and recovery packages, including major infrastructure. The makeup of those investments and accompanying policies has the potential to either entrench fossil fuel-intensive economic systems and "business as usual" urban development patterns for many more years, or accelerate progress towards a low-carbon future with more accessible and inclusive cities.

COVID-19 has reshaped how people access the city, information, goods and services.

Several factors determine a city's accessibility.[3] The first is how land is used and managed and how different opportunities are geographically distributed within and around the city. The second is how affordable services and amenities are and whether there are social barriers to accessing them, alongside people's individual needs and abilities. The third is the ease of transport – to move people and goods – and, where relevant, the availability of telecommunication (Figure 1). Improving accessibility requires consideration of social norms, vested interests, appropriate technology and technical capacity, among others; sometimes, it may require trade-offs between the three factors.

Figure 1: The three components facilitating urban accessibility

As a good balance between these different components of urban accessibility, the ideal of compact, connected, clean and inclusive cities (3C+ cities) has gained considerable traction among policy-makers over the past decade.[4] This involves increasing liveable densities; creating more mixed-use urban districts where people of all incomes and social statuses can live, work, study, shop and socialise without excessive travel; and enhancing the overall quality of urban design. When this is combined with clean, carbon-neutral and citywide public transport, urban areas can use resources more efficiently and benefit from agglomeration effects, greater productivity and innovation.[5] In other words, by generating new physical proximities without displacing existing populations, compact cities can achieve greater prosperity and social inclusion at lower overall environmental costs.

The pandemic has posed challenges to key elements of this approach, including density, mass transit, metropolitan-wide travel and the gathering of larger groups of people. More generally, COVID-19 has reshaped how people access the city, information, goods and services. Above all, the pandemic has highlighted our over-dependence on transport for urban accessibility –moving people across longer distances. It has further illustrated the degree to which transport is derived demand: people do not move for movement's sake, but to access opportunities.[6] The pandemic, which forced large populations to stay close to home, provided a strong reminder of the value of physical proximity. This is an opportunity to shift the urban policy debate from a focus on improving mobility, to enhancing accessibility by revisiting public space, urban design and spatial planning.

Digital connectivity is also playing a growing role in urban accessibility, further reducing the need to travel. To achieve the greatest possible contribution to emission reduction, it needs to be accompanied by a shift to green and carbon neutral digitalisation (e.g. data centres operating with renewable electricity and heat recovery, low embedded carbon and energy efficient digital appliances, reuse and recycling of network and device components).

A key take-away from individual and collective responses to the pandemic is that while the transport sector plays a crucial role in urban accessibility, it is only one of multiple elements. Mobility is not the same as access.

Systemic interventions could also address many other negative externalities of existing urban transport patterns. These are societal costs that result from achieving urban access mainly through transport and cars. Better approaches to urban accessibility could significantly reduce premature deaths from air pollution[7] – 4.2 million in 2016 – and from traffic crashes – around 1.35 million per year, the leading cause of death for children and young adults aged 5–29 years.[8] Facilitating walking and cycling would also increase physical activity and help overcome high rates of type 2 diabetes, obesity and heart disease in many countries.[9] More compact, walkable cities and public transport reduce the traffic congestion associated with car-oriented urban development and lead to agglomeration effects and increased productivity.[10] Community cohesion and the social life of cities can also improve considerably when dependencies on high traffic volumes are reduced.[11]

> **More compact, walkable cities and public transport reduce the traffic congestion associated with car-oriented urban development and lead to agglomeration effects and increased productivity.**

Over the last decades, **many cities successfully initiated a shift towards new models of urban development and accessibility**. Rather than sprawling, peripheral urban expansion, cities redeveloped and intensified the use of existing urban land and created new proximities between urban opportunities. Major investments in public transport and street redesign for more equitable mobility reduced car use and increased the share of trips made on foot, by bike and by bus and metro. Technological innovation enabled car- and ride-sharing, providing flexibility, increasing the utilisation of each vehicle and reducing the need for parking. While the pace and scale of these changes had yet to match the urgency of climate change, or reach all urban areas, they showed a clear new trajectory towards a more sustainable future of cities.

THE NEW RISK: LOSING IMPORTANT GAINS IN URBAN ACCESSIBILITY

Around the world, **COVID-19 has disproportionately affected cities**. Though over time, the pandemic spread more evenly across countries, more than 90% of confirmed cases were initially estimated to come from urban areas.[12] Important functions of cities were put at risk, and with them, socio-economic development and the potential for a safer climate and greener future. Billions of urban dwellers were asked or ordered to stay home; offices shut down, doing business remotely and holding meetings and events virtually;[13] and students were required to switch to online learning.[14] Business districts were left deserted, and hospitality and retail businesses suffered record reductions in customers – all with far-reaching consequences for those businesses and the livelihoods of their employees.[15][16]

The transport sector faces particular, immediate challenges, as public transport ridership has dropped, and more people are choosing to drive. If this pattern holds, it could increase GHG emissions, air pollution and congestion and encourage further car-centric urban development. The risk is greater if the frequency and quality of public transport services diminish relative to pre-COVID levels. Mass transit systems are under considerable strain already due to significant revenue losses and increasing operating costs during the pandemic.[17] If public confidence is not restored and the loss of revenue is not compensated through other finance, it could lead to a death spiral for public transport.[18][19]

China offers a cautionary tale. There, car traffic quickly ramped up to pre-COVID-19 levels, while public transport and long-distance rail use had not yet recovered several months later.[20] A similar picture is beginning to emerge from other cities: in New York, new car registrations rose by 18%;[21] traffic in Perth grew more than 12 times faster than forecast in 2019;[22] and congestion in outer London surpassed pre-pandemic levels by late summer 2020.[23] While walking and cycling increased in many cities, attracting significant investment to support these modes, it remains uncertain whether these advances will be outweighed by a possible increase in car use.[24]

A further challenge has been the **proliferation of anti-urban sentiments**, fuelled by a backlash against dense urban environments seen as increasing infection risks.[25] Though low-income people living in crowded and substandard conditions were, indeed, particularly vulnerable to the pandemic – especially because most could not work remotely, and thus were also exposed to the virus on the job and while commuting – there is no evidence of urban density inherently increasing COVID risk.[26] Structural economic and social conditions are the most important factors explaining infection variations across urban regions.[27] Still, many people perceived cities as less safe. With the urban advantages of access to culture and economic opportunities reduced by the pandemic or offset by digital connectivity, some were drawn to suburban or rural areas, looking for larger homes, private green spaces and access to nature.[28]

This shift in preferences could be seen when lockdowns were eased after the first wave of infections and footfall was much slower to recover in city centres than in suburbs or non-urban areas.[29] A potential decline of urban cores could severely compromise the push towards more compact, connected and low-carbon development alongside important targets for biodiversity and the preservation of open land and forests. This is not to suggest that there will necessarily be any slowdown in urbanisation rates globally, but rather that the type of urbanisation may change in ways that jeopardise the environment, liveability and equity.

A suburban and rural turn of remotable knowledge workers also risks further **exacerbating existing urban inequalities**, reducing the resilience of urban societies and their economies. Given the high interdependence between jobs in retail and hospitality and the wider knowledge economy, a reduction in the number of people working in urban offices, especially in inner city business districts, will have knock-on effects for the entire urban labour market and risks considerable job loss.[30][31][32] Furthermore, while many higher-income knowledge workers have large enough homes to be able to work remotely from home offices in separate rooms, many lower-income people who would work remotely have been forced to do so in unsuitable spaces, often sharing rooms with other adults or with children attending school remotely.[33]

By far the greatest immediate risk to sustainable and inclusive urban accessibility relates to **carbon-intense recovery efforts**. National governments under pressure to reenergise the economy can easily backslide into policy-making that undermines both climate and sustainable urban development targets.[34] Though many governments have taken positive steps, on balance, pandemic recovery policies and investments are doing more to undermine climate and sustainable development targets than to advance them. Vivid Economics' Greenness of Stimulus Index shows that of US$17.2 trillion in emergency response and recovery packages adopted as of June 2021 in the G20 and 10 additional countries, 28% had gone to environmentally sensitive sectors (energy, transport and waste – the most relevant to urban emissions – as well as industry and agriculture). In 15 of the G20 economies and half the other countries, the analysis found, those investments would have a net negative environmental impact, helping entrench fossil fuel dependency and "business as usual" practices.[35]

The shutdowns and reduced economic activity resulted in a 6% drop in global GHG emissions in 2020,[36] but **as activities have normalised, many places have seen a return to pre-pandemic emissions levels.**[37] Recent work by the International Energy Agency (IEA) shows that emissions have rebounded most quickly in the countries that invested the least in green economic stimulus measures, including Brazil, China, India and the United States.[38] This increase was largely driven by a recovery in road transport activity. Whether directly related or not, countries in Europe that have invested the most in the green recovery, including France, Germany, Spain and the UK, have been able to keep overall emissions low.[39] It is clear that without deliberate and immediate action, the world could come out of the pandemic with less accessible and less inclusive cities, set back by behaviour change, urban restructuring and recovery efforts that compromise environmental sustainability.

THE POLICY WINDOW: ONE LAST CHANCE FOR TIMELY CLIMATE ACTION IN CITIES

Climate change is advancing rapidly. This means the early 2020s may well be **the last opportunity to make major changes in urban systems on time** to avoid climate change tipping points that could make a "hothouse earth" unavoidable.[40] Prior to the pandemic, transport-related emissions were not only stubbornly high, but had started to rise again in several countries where they had been reduced.[41] Indeed, transport emissions were growing more rapidly than in any other sector and were projected to increase by 50% by 2035 and almost double by 2050 under a business-as-usual scenario.[42] In most US cities, carbon emissions from road transport have increased since 2015, mainly as a result of the increasing share of sport utility vehicles (SUVs) and other heavier, carbon-intensive vehicles.[43] Similar patterns were seen around the world, offsetting any GHG reductions from rapid growth in the sales of electric vehicles.[44]

The urban accessibility transformation will require **agile public leadership and planning to advance urban proximity and dynamism** with an appropriate mix of urban functions and land uses, as well as updated regulatory, zoning and taxation policy. Patterns of urban space use are changing rapidly. For example, it is likely that demand for conventional central office and retail spaces may never fully recover, which opens up the possibility of converting vacant commercial buildings into housing or other more diverse uses.[45] The pandemic has also underscored the importance of designing more flexible and modular buildings that can be easily adapted to new uses without having to be torn down and rebuilt from scratch.[46]

The case for **breaking with past trends and approaches to urban accessibility** has never been stronger. This perspective also aligns with the broader consensus that the COVID-19 recovery should not be a return to "business as usual"[47] and instead build on some of the achieved positive urban development and transport changes since early 2020. Recently published work by the IEA shows that a drop in road transport was centrally responsible for the overall emissions decrease seen around the world in 2020, highlighting the fact that action on decarbonising the transport system has significant and immediate impact on efforts to address the climate emergency.[48]

The pandemic allowed for **policy experiments at a previously unconceivable scale**. Transport policy is a particularly well documented case study. Changing mobility behaviours have become a great opportunity to develop innovative and sustainable alternative transport options and accessibility pathways. On the one hand, remote working, orders to stay local and the risk of infection have radically disrupted daily routines and unravelled habitual travel patterns. On the other hand, better urban accessibility has been tested through a range of ongoing experiments and innovations. Eight of them are discussed in greater detail in Section 6:

1. **National urban transport policies and investments** focused on driving the radical decarbonisation of urban accessibility by realigning incentives and providing credible alternatives, including more dense, interconnected and safe public transport networks;

2. **Comprehensive housing and land use reform**, with fiscal incentives to foster compact and inclusive cities, reviewing housing policy to ensure coherence with environmental and social policy objectives and unlocking the potential of the rental market;

3. **Hyper-localisation and "15-minute districts"**,[49] with inclusive zoning policies that promote affordable infill housing and mixed and flexible use of buildings;

4. **New urban mobility and last-mile connectivity**,[50] with multimodal mobility apps enabling users to access new mobility offerings alongside traditional public transport services, as well as investment in the development of shared micro-mobility offerings;

5. **Reallocation of road space and tactical urbanism**, with new powers to enforce low-traffic streets, updating highway codes to ensure a hierarchy of road users that prioritises the most vulnerable and non-motorised modes and removal of parking space requirements;

6. **New finance for metropolitan-wide transport**,[51] by reallocating new transport infrastructure investments to maintain and improve existing assets and services, and reinvesting the proceeds from fees, pricing and taxation related to private car use in public transport;

7. **Digital connectivity**,[52] with direct investments in and delivery of digital connectivity through the public sector and enabling new finance, such as universal service funds;

8. **Urban freight and logistics**, with new urban consolidation centres, a shift towards environmentally friendly modes and designated freight delivery zones, parcel collection and drop-off points.

The global exposure to complex emergencies (related to health, humanitarian issues, climate, economy and security) has also revealed the limitations of existing urban governance arrangements and is thus **accelerating new institutional arrangements and financing models**.[53] These new forms of urban governance will have to facilitate more rapid and radical policy interventions while ensuring the democratic legitimacy of such actions. For cities, a shift away from a focus on facilitating movement and transport and instead improving urban accessibility more holistically will have to underpin institutional innovation to then facilitate the required transition while supporting the development of a new economy.

PART 1
National COVID-19 recovery measures and 3C+ cities

Given the nature of the intertwined crises faced by the world today, it is difficult to predict future developments or how citizens might behave in the long-run. Still, amid these uncertainties, the greatest opportunity to create certainty and establish intentional development pathways that directly address the global emergencies is in the interventions and recovery packages being rolled out by governments. In one way or another, governments will have to decide, for example, whether to provide greater levels of financial support to public transport or highway construction; support conventional car industries or enable new urban mobility solutions; grant cities the powers to radically redistribute urban street space or prioritise fast-moving traffic managed by national highway agencies. All these choices will have far-reaching consequences for the future of cities and could lock in certain development pathways for decades to come.

3C+ cities can make more efficient use of infrastructure investments, reduce energy consumption and foster sustainable and inclusive economic growth.

This section focuses on how national policy responses to the triple crisis may affect urban accessibility. In particular, it analyses the potential impact of national fiscal recovery packages on efforts to build more compact, connected, clean and inclusive cities.[54] During the pandemic, such cities have been shown to be better able to respond quickly by providing health and social services. In the long term, that urban development is crucial to making cities truly accessible.[55] 3C+ cities can also make more efficient use of infrastructure investments, reduce energy consumption and CO_2 emissions and foster sustainable and inclusive economic growth.

The COVID-19 crisis is ongoing, so it may be too soon to reach solid conclusions, but analysis of early developments can still provide indications of possible impacts. As noted above, the review spans 10 countries: China, Colombia, Germany, Japan, South Korea, Mexico, South Africa, the United Kingdom and the United States. All are G20 member countries, meaning they are among the world's major economies.

The European Union's stimulus plan warrants a special mention. Designed to alleviate the impact of COVID-19 on EU Member States by promoting modernisation, digitalisation and climate action (see Box 1), it certainly will have an impact on urban development policies. The measures' effectiveness will depend on national and subnational governments' capacity to make effective use of the resources provided. Although it is still too early to determine the effect these measures will have on cities, the EU recovery plan could help make urban areas more sustainable and leverage (digital) technology for service delivery. That, in turn, could shape EU Member States' choices about housing, transport, infrastructure and land use measures, if they want to benefit from those funds.

BOX 1	**The EU stimulus package – NextGenerationEU**

To assist EU countries in their recovery efforts from the COVID-19 pandemic, in July 2020 the European Union adopted the NextGenerationEU long-term budget, aiming to help repair the immediate economic and social damage caused by the pandemic. Its underlying vision is to build an EU that is greener, more digital, more resilient and better fit for current and future challenges.

The budget for the NextGenerationEU amounts to €750 billion for recovery measures. More than 50% of the resources will be devoted to modernisation through, among other things, research and innovation; fair climate and digital transitions; preparedness, recovery and resilience; modernisation of traditional policies such as cohesion and the common agricultural policy; fighting climate change; biodiversity protection; and gender equality. A key feature of the recovery plan is that 30% of the budget will be allocated to fighting climate change, and 20% will be invested in the digital transformation. Any EU Member State can benefit from this budget, and subnational governments must be involved in the execution of the resources, although mechanisms for their involvement are not clear.

Source: European Commission, Recovery Plan for Europe, at:
https://ec.europa.eu/info/strategy/recovery-plan-europe_en#nextgenerationeu

Case studies for this paper indicate that countries are relying heavily on urban-related measures to underpin their economic recovery. Below they are discussed in three main blocks: transport and infrastructure, housing and land use and urban governance and public administration. However, it is important to highlight the need for integrated policies and planning to take advantage of synergies and improve policy coherence.[56]

3. The transport and infrastructure sectors

Ensuring that public transport systems continue to operate smoothly despite lockdowns has been a key priority for governments. During confinement periods, the use of public transport (within urban areas and across regions) significantly declined, as people were asked to minimise their mobility. This created significant economic challenges for transport authorities, and some, such as Transport for London (TfL), required a national government bailout to ensure a minimum level of service. As shown in Table 1, bailouts of public transport authorities and airlines were among the most common stimulus measures adopted in the transport and infrastructure sectors. Governments tried to strike a balance between reduced operations and ensuring enough capacity for key workers to commute while practicing physical distancing. Airline bailouts seem to be the most widely adopted measures, probably because travel restrictions resulted in a dramatic drop in passenger demand (90% reduction in April 2020 and 75% in August 2020).[57]

The challenge for countries is to avoid reinforcing car dependency through recovery investments.

Governments are also funding longer-term investment programmes to replan and reprioritise public transport and its infrastructure. Road-building and improvement programmes have been widely adopted as well, probably due to the expected spillovers in economic activity and development (i.e. connectivity, access to services and facilitation of trade) and, in some cases, the need to repair and upgrade road infrastructure. The challenge for countries is to avoid reinforcing car dependency through these investments. Funding for local public transport and for active mobility (walking and cycling) was also provided in many countries, which has accelerated the transition to more sustainable mobility in several cities.

Recovery packages include other types of infrastructure investments as well. In particular, governments are relying on investments in digital infrastructure to underpin economic recovery. Digital technologies have kept economic activity working during the lockdown periods by enabling remote work, events and business transactions. Even before the pandemic, countries were already strengthening their policy strategies for digital transformation. Thirty-four OECD countries have a national digital strategy to enhance policy coordination at the highest level of government.[58] The recovery packages show governments aim to accelerate digital technology adoption, in particular 5G, and rethink business models for a more sustainable recovery. This is also giving impetus to local governments to adopt or reassess their "smart city" strategies. The aim is to use digital technologies to support better integration within the individual city systems and enable them to work more effectively through, for example, smart mobility and smart healthcare. For local businesses, digital technologies offer new business opportunities and new ways to meet customer needs. For citizens, they may enable more personalised services.

Table 1. Transport measures included in the fiscal recovery packages

EMERGENCY AND LONG-TERM RECOVERY MEASURES	China	Colombia	Germany	Japan	South Korea	Mexico	South Africa	United Kingdom	United States
TRANSPORT									
Emergency measures									
Subsidies or tax breaks for purchasing alternative fuel or hybrid private vehicles	✓		✓						
Relaxing restrictions on license plates and number of vehicles	✓								
Fleet replacement programmes to promote electric mobility			✓						
Extending the vehicle age for expiration (buses and taxis)					✓				
Bailout of public transport authorities								✓	✓
Long-term recovery measures									
Financial support for local and regional public transport			✓	✓			✓	✓	✓
Funding R&D on electric mobility and battery cell production			✓	✓					
Funding industry investments in the alternative fuel vehicles including the expansion of safe charging infrastructure for electric vehicles	✓		✓						✓
Higher taxes for high emission vehicles and/or eco-bonuses for electric or hybrid vehicles			✓						
Road building and improvement programmes (including secondary and tertiary network)	✓	✓		✓			✓	✓	✓
Funding infrastructure for cycling and walking		✓				✓		✓	
Funding for low-traffic neighbourhoods, and delimitation of streets for the exclusive use of pedestrians						✓		✓	
Expansion and modernisation of the urban and inter-city rail networks	✓		✓					✓	✓
Decarbonisation of heavy industry, construction, transportation and aviation sectors	✓							✓	
Airlines bailouts	✓		✓	✓	✓		✓	✓	✓
INFRASTRUCTURE									
Long-term recovery measures									
Funding for the expansion of solar and wind power and promotion and hydrogen technology			✓					✓	
Construction of refineries and airports, or redevelopment of harbours				✓		✓			
Support for digitalisation of public services				✓	✓				
Investments in digital infrastructure for information and network technology (5G networks, big data, artificial intelligence)	✓		✓	✓			✓	✓	✓
Digitalisation of construction processes (i.e. 3D digital mapping)				✓					
Improvements in water and sanitation infrastructure								✓	
Revitalisation of urban parks				✓					

TRANSPORT MEASURES COULD ENHANCE URBAN ACCESSIBILITY, BUT SOME MAY ACTUALLY DO HARM

The prominent role of transport measures in most governments' stimulus and recovery packages could, in theory, help reduce car dependency. However, few governments have strengthened incentives to avoid driving. Some countries, such as Germany and the UK, have explicitly supported the maintenance and expansion of public transport networks. The EC Sustainable and Smart Mobility Strategy is expected to have a strong impact on mobility strategies across EU Member States, as by 2030, it aims to have at least 30 million zero-emission cars in operation, double high-speed rail traffic and make 100 European cities climate-neutral.[59] France, for example, has made ecological transition a key feature of its recovery strategy, allocating €30 billion to it out of a total €100 billion recovery budget. A key element of this strategy is sustainable transportation, which is expected to help addressing climate change and air pollution. Between 2021 and 2022, the French government will invest €1.2 billion in developing safe and efficient cycling networks, adding rail in the densest areas for everyday mobility and developing new offers of public transport services in urban areas.[60]

Some countries adopted rapid responses, sometimes improvised, to address the pandemic and maintain services during lockdowns. Contagion risks made crowded buses and trains a liability, so governments facilitated the purchase and use of private vehicles. Such measures aimed to provide safe alternatives for mobility while giving a boost to the automobile industry. However, low-income people without cars still had to travel by public transport, and the frequency of service was sometimes reduced. Some governments prioritised hybrid or electric vehicles, reducing the potential climate and air pollution impacts, but increased car use would still contribute to road congestion.

COVID-19 is likely to change urban mobility in lasting ways. Although public transport will continue to be crucial, the importance of being able to walk or cycle to access jobs, goods and services has gained prominence. Creating urban environments that are friendly to non-motorised modes of transport will be critical in a transition to a low-carbon and sustainable recovery. Providing quality infrastructure and incentives such as subsidies for the purchase of bicycles are proven ways to help achieve this.[61] The fiscal recovery packages in some countries seem to acknowledge that public transport and mobility needs and preferences will change, and that those changes will be necessary to enhance resilience and preparedness for future crises. Fiscal recovery packages include funding for public transport (trains, buses), freight transport, cycling and walking infrastructure, electric mobility and road-building and improvements alike. They are key elements due to their contribution to economic recovery and growth, as they enable the movement of people and the generation of business and jobs. Some countries have introduced spending measures that support energy efficiency programmes or subsidies for research and development (R&D) to unlock clean technologies and help reduce carbon emissions in cities. In the long term, this could facilitate the introduction of carbon pricing, which not only improves environmental outcomes but also raises revenue that can be used to manage the trade-offs among environmental, social and economic goals.[62]

Table 2. How transport-related measures in fiscal recovery packages would affect cities

MEASURES	Impact on urban development			
	Compact	Connected	Clean	Inclusive
Short-term alleviation measures				
Subsidies or tax breaks for purchasing alternative fuel or hybrid private vehicles	Pink	Orange	Orange	Orange
Relaxing restrictions on license plates and number of vehicles	White	White	Pink	Pink
Fleet replacement programmes to promote electric mobility	White	White	Green	Orange
Extending the vehicle age for expiration (buses and taxis)	Green	Green	Pink	Orange
Bailout of public transport authorities	Green	Green	Green	Green
Long-term recovery measures				
Financial support for local public transport	Green	Green	Green	Green
Funding R&D on electric mobility and battery cell production	White	Green	Green	White
Funding industry investments in the alternative fuel vehicles including the expansion of safe charging infrastructure for electric vehicles	Green	Green	Green	Orange
Higher taxes for high emission vehicles and/or eco-bonuses for electric or hybrid vehicles	Orange	Green	Green	Orange
Road building and improvement programmes (including secondary and tertiary network)	Orange	Green	Orange	Green
Funding infrastructure for cycling and walking.	Green	Green	Green	Green
Funding for low-traffic neighbourhoods	Green	Green	Green	Green
Expansion and modernisation of the urban and inter-city rail networks	Green	Green	Orange	Green
Decarbonisation of heavy industry, construction, transportation and aviation sectors	White	White	Green	White
Airline bailouts	White	White	Orange	Orange

Note: Green means that the measure in the row supports progress towards the objective in the column; orange means that the measure in the row may either support or hamper progress to the objective in the column, depending on the context; pink means that the measure in the row hampers progress towards the objective in the column; white means no known effect.

Table 2 shows how the transport-related measures adopted by governments would advance or hinder progress towards 3C+ cities. Though some measures could do harm, most are potentially beneficial. Investments in public transport – a key element of connected cities –reduce the need for private vehicles and, consequently, congestion and pollution.[63] Good connectivity within cities, regionally and beyond through efficient and effective public transport is a major economic resource. Notably, however, fiscal stimulus packages are mostly not using taxes as incentives for more sustainable transport. The OECD has observed that taxing transport, especially car use, more heavily to reflect its true costs (including externalities such as GHG emissions, local air pollution, congestion and noise) would lead to less spread-out patterns of urban development.[64] A variety of instruments can be used, depending on the country context. Higher fuel taxes increase the costs of car use throughout countries. Countries will need complementary policies to ensure that residents have alternatives to driving long distances.

COVID-19 opens the possibility for countries to green their economic recovery and their economies by creating new jobs in the sector, reducing CO2 emissions and improving the quality of the urban environment. The recovery of the transport sector has to be aligned with decarbonisation objectives and the need to build resilience to future shocks. Doing this has been shown to have strong multiplier effects and also create jobs.[65] If the recovery packages include well-designed tax policy that reinforces green stimulus in the transport sector through, for example, carbon pricing, that will encourage low-carbon investments, which can help build more compact, connected, clean and inclusive cities while spurring economic recovery.

The recovery of the transport sector has to be aligned with decarbonisation objectives and the need to build resilience to future shocks.

Policy-makers deciding whether to further expand transport infrastructure such as ports, airports and roads need to weigh the potential socio-economic benefits against the fiscal impacts of such projects and the potential for environmental harm – both discussed further below. Similarly, bailouts for the aviation sector could have important economic benefits, but the lack of green conditionality could threaten to undermine this.[66] To advance environmental and climate objectives, some governments (i.e. China, Germany and the UK) have included financing for research in clean technologies and the installation of infrastructure for green mobility as part of their fiscal recovery packages. Urban transport projects require significant local engagement: authorities will need to plan for multimodal transport systems, restructure urban spaces under human-centric and green lenses and promote mixed land uses. Notably, to date, fiscal recovery packages do not prominently feature any funding for smart mobility initiatives, though cities such as Seoul (South Korea) have included smart city initiatives as part of their recovery efforts (Box 2). National fiscal recovery packages appear to give priority to electric mobility (research and infrastructure) to contribute to meet environmental goals.

The trade-offs involved in choosing to fund road-building and improvements merit special attention. Roads and motorways support automobile use and thus contribute to air pollution, noise and congestion. They also alter landscapes and can harm wildlife; a 2001 study estimated that one-fifth of the United States' land area is ecologically affected by roads.[67] However, in societies that are already car-dependent, roads are crucial for mobility, and building and maintaining them can be the lowest-cost way to link suburbs with city cores or to connect people across small distances. They are essential for people living in remote places, facilitating trade and access to services, jobs and education. They have also become essential for freight – though the climate impact of this function can be reduced by creating synergies with rail transport. It is therefore important to modernise vehicles and promote alternative sources of energy to make car transportation more compatible with 3C+ cities.

In looking at transport projects in recovery packages – including ones aimed at improving urban accessibility in the 3C+ model – there are three points worth noting. First, these measures will take time to make an impact, and governments will have to maintain the momentum for investment in transport infrastructure in the medium and long term. This is important in a context where teleworking is being actively encouraged, and the decrease in demand for mobility may persist. Reallocating street space to provide room for pedestrians, cyclists and other forms of active mobility, with health and environmental benefits, will take time as well.[68] Second, most of the announced investments are expansions or accelerations of work that was already being done or considered before the pandemic. For example, in Seville and Mexico City, COVID-19 gave a push to ongoing efforts to add cycling infrastructure. Third, the impact of transport investments in each country will depend on the quality of the existing infrastructure; synergies with other sectoral policies, such as housing and environment; the green conditions attached to funding, the robustness of the land use plans and the capacity of the local authorities to implement them; and how decisions on which regions/cities or routes to invest are made, and how funding can be sustained over time.

- In **Seattle** (US), authorities closed 20 miles of streets to most vehicles as part of a "Stay Healthy Streets" initiative adopted at the peak of the pandemic to ensure physical distancing; the closures have since been made permanent.

- In **Seoul** (South Korea), in addition to fast-tracking a bike lane system with a fast lane, aiming to reach a 15% modal share for bikes by 2030, authorities are pioneering smart green mobility options through driverless vehicles, delivery of goods via robots and smart parking lots.

- In **Paris** (France), authorities plan to create a "15 minute city" (see Section 7), in which residents' needs can be met within a 15-minute walk, bike ride or transit ride. Key measures include promoting multimodal transport systems, expanding bike infrastructure and creating green spaces.

- **Washington, DC** (US)'s ReOpen DC plan includes specific measures to rethink the orientation of public spaces prioritising wider sidewalks, increasing bike lanes and assigning more lanes for buses.

- In **London** (UK), the local government is promoting low traffic neighbourhoods (LTN) to facilitate walking and cycling. This way the government expects to improve air quality and get more space for essential car trips, deliveries and emergency services.

- **Auckland** (New Zealand), **Barcelona** (Spain), **Bogotá** (Colombia), **Lima** (Peru), **New York** (US), **Quito** (Ecuador) and even the **Ile-de-France** region are aiming to create city- or region-wide networks of emergency cycling and pedestrian infrastructure to facilitate socially distanced walking and cycling against the backdrop of lower rates of public transport use.

Sources: *OECD (2020) Cities policy responses*, at http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/ and OECD (2020), *Improving Transport Planning for Accessible Cities, OECD Urban Studies, OECD Publishing, Paris*, https://doi.org/10.1787/fcb2eae0-en. *Paris: HERE360* https://360.here.com/15-minute-cities-infrastructure; *For London:* https://madeby.tfl.gov.uk/2020/12/15/low-traffic-neighbourhoods/

INFRASTRUCTURE INVESTMENTS HAVE THE POTENTIAL TO ADVANCE CLIMATE GOALS AND REDUCE INEQUITIES, BUT NOT ALL ARE BENEFICIAL

Infrastructure investments create jobs and contribute to economic growth by increasing the assets which are necessary for competitiveness. The fiscal recovery packages analysed for this report include a wide array of infrastructure investments: from renewable energy to oil refineries, airports and digital infrastructure (Table 3). Some countries have long underinvested in critical infrastructure, particularly for provision of basic services such as water and electricity. Some emerging economies seem willing to use COVID-19 recovery packages to address these critical areas and promote well-being. To achieve lasting change, those countries need to address the fiscal and management drawbacks that have long hindered investments in critical infrastructure in cities.

Several advanced economies, meanwhile, are investing in infrastructure to address climate change and to promote digitisation – both of which can help improve urban accessibility. Investments in digital infrastructure have the potential to boost inclusive economic growth in cities and prepare them for future crises. However, the potential for remote working differs strongly among and within countries; for example, whereas 50% of jobs can be done via telework in Luxembourg, in Turkey only 21% of jobs can be done from home.[69] Similarly, almost 55% of jobs in London can be done remotely, but only 35% of jobs in Northeast England can. Germany, a world leader in engineering and technology, actually lags behind other advanced economies on the digital transformation.[70]

COVID-19 has highlighted the need for high-quality, reliable digital connectivity. If cities are to benefit from investments in digital infrastructure to underpin an inclusive and green recovery, governments may need to invest in improving connection speeds, ensure that high-speed internet access is more evenly distributed across cities, improve mobile data usage, reduce the digital gap across urban and rural areas and help small and medium-sized enterprises (SMEs) improve their use of digital technologies to boost innovation and productivity. Countries such as Colombia and Mexico need to further strengthen their digital connectivity structure through a national agenda and national plans with broadband to take advantage of advanced technology.[71]

Table 3. Infrastructure measures included in fiscal stimulus packages

MEASURES	Impact on urban development			
	Compact	**Connected**	**Clean**	**Inclusive**
Long-term recovery measures				
Funding for the expansion of solar and wind power and promotion of hydrogen technology		green	green	orange
Construction of refineries and airports			pink	orange
Support for digitalisation of public services	green	green	green	green
Investments in digital infrastructure for information and network technology (5G networks, big data, artificial intelligence)		green	green	orange
Digitalisation of construction processes (i.e. 3D digital mapping)			green	orange
Improvements in water and sanitation infrastructure	orange		green	green
Revitalisation of urban parks	green	green	green	green

Note: Green means that the measure in the row supports progress towards the objective in the column; orange means that the measure in the row may either support or hamper progress to the objective in the column, depending on the context; pink means that the measure in the row hampers progress towards the objective in the column; white means no known effect.

City governments have also embraced digital technologies in their own operations to provide services, information, access to education and culture and means of participation. OECD research has also found that cities are solidifying and expanding the use of "smart city" tools.[72] Cities have realised that investing in digital infrastructure, promoting innovation and fostering collaboration with other actors (private and civil society) are key to ensuring universal access to internet, advancing an inclusive and green recovery and building a more resilient future. Equally important is ensuring that internet services are priced to be affordable to low-income households, while still enabling service providers to be competitive.

BOX 2   **Digitalisation initiatives in cities during the pandemic**

- **Milan** (Italy) introduced an Adaptation Strategy 2020 that includes a section on digital services, planning for expansion, simplification and acceleration of the provision of digital services to citizens and the strengthening of the ICT network to support it.

- In **Florence** (Italy), where 85% of services to citizens were already available digitally, authorities have committed to get to 100%. This includes the digitalisation of the authorisation processes.

- In **Seoul** (South Korea), digitalisation efforts are being accompanied by public interventions to close the digital gap and increase technological access for all residents.

- **Tokyo** (Japan) is accelerating the digital transformation with the promotion of online learning, telemedicine, telecommunications and the digitalisation of public services. The smart school project intends to enable all public schools students in the city to study online.

- In **Riga** (Latvia), the City Development Department has designated one day a week as a remote working day, organising webinars on city planning documents rather than in-person meetings.

- In the **Île-de-France** region, municipalities and business reinforced their collaboration to work on the development of new solutions to support citizens and the economy. The region and its public/private partners created new COVID-19 related services, such new digital and sustainable services and a public private data and services platform, to support connecting businesses and people.

Source: OECD (2020) Cities policy responses, at http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/ For Île-de-France: https://www.linkedin.com/pulse/digital-service-territories-resilience-time-crisis-christine-le-brun/?trackingId=IU8ABwkwfM7jOtXFEDs0mA%3D%3D

4. Housing and land use policies

Housing is directly targeted in many recovery packages, but the critical role of land use policy in effective urban development has received far less attention. The reason may be that housing has more immediate benefits, providing shelter to people and thus contributing to social development. By contrast, land use policy is a more medium- to long-term consideration and is often considered the domain of subnational governments. Housing creation also generates jobs (including in construction) and supports billions of dollars' worth of economic activity. In the US, for example, housing accounted for 17.5% of GDP in 2020, including 13.3% spent on housing services.[73] In Mexico, the housing sector contributes 6% of annual GDP, half of which comes from housing services generated in the market.[74] Subsidies for housing improvement are the most common measures included in countries' recovery packages. At a time when people have lost jobs and seen their incomes drop, home improvements rather than buying a new home seem to be the most sensible option for many low- and middle-income households. Credits or subsidies for buying or renting social housing are also included in recovery measures, aimed at supporting governments' social policy agenda.

Table 4. Housing measures included in fiscal recovery packages

EMERGENCY AND LONG-TERM RECOVERY MEASURES	China	Colombia	Germany	Japan	South Korea	Mexico	South Africa	United Kingdom	United States
HOUSING									
Emergency measures									
Measured forbearance to affected households to avoid evictions or mortgage foreclosure moratoria or direct support to pay for rent	✓			✓	✓	✓			✓
Rent controls					✓				
Fiscal transfers to local authorities to support payment of housing benefits			✓						
Special emergency loans for housing construction companies					✓				
Long-term recovery measures									
Credits and/or subsidies for social housing acquisition		✓		✓		✓			✓
Subsidies or tax incentives for affordable rental housing		✓		✓					
Housing construction programmes						✓	✓		
Housing improvement programmes via vouchers or subsidies (generally with green technologies)				✓		✓		✓	✓
Simplification of procedures for housing construction permits								✓	
Retrofitting public sector buildings or green housing programmes				✓				✓	

HOUSING SUPPORT MEASURES MAY CONTRIBUTE TO SOCIAL INCLUSION, BUT COULD ALSO AFFECT COMPACTNESS AND CONNECTIVITY

Housing is an integral part of any inclusive growth strategy. Affordable housing in high-opportunity neighbourhoods with multimodal transport systems can support economic mobility.[75] Access to affordable housing can also attract businesses and qualified workers to a city, increasing its competitiveness. However, the COVID-19 pandemic has hit the housing sector hard. Declining incomes and job losses have put many people at risk of losing their housing – particularly lower-income households – due to unpaid rents or mortgages. Developed and emerging economies alike have provided support to vulnerable households to prevent humanitarian crises and associated public health risks.

COVID-19 has highlighted inequalities in housing, as lower-income households often live in substandard conditions. A major constraint during lockdowns has been that many people's homes do not provide adequate space for leisure, study and work. As OECD has found out, cities with inadequate housing conditions and a high concentration of urban poor are more vulnerable to the impact of the pandemic than those that are better resourced, less crowded and more equal.[76] Therefore, it is not surprising that emergency responses to COVID-19 and fiscal recovery packages included measures to alleviate the negative consequences of the economic crisis for tenants and mortgage holders to at least maintain their living standards, and for builders and lenders to keep investments and jobs. As Table 4 shows, moratoria on evictions and rent and mortgage payment forbearance have been widely used by countries to help keep people in their homes.[77]

Based on the available information, it is not clear how housing-related measures included in fiscal recovery packages will affect efforts to build 3C+ cities in the long term. It will depend on how those measures are implemented and the specific context of each city. Countries and cities are still coping with the pandemic, with some ordering new lockdowns. For a positive impact, it is important to also introduce reforms to aligning local planning, land use and zoning regulations; revise social housing standards to provide living spaces that better meet households' needs; facilitate advances in housing construction technologies, building materials, and construction processes; invest in urban and housing renewal strategies; and coordinate housing with other sectoral policies, such as transport, health and labour markets. Research has shown that land use and zoning regulations that favour single-family housing can negatively affect both social inclusion and environmental sustainability.[78] It is not clear, however, to what extent the recovery measures pertaining to the housing sector belong to or are part of any specific plan or strategy. In some cases governments are revamping existing housing programmes and urban regeneration strategies by channelling additional resources to these initiatives.

The possible impact of the housing policy responses on the housing market and its long-term distortions have been analysed in other policy notes.[79] However, these policy measures will also have a long-term impact on the creation of inclusive 3C cities. As Table 5 suggests, most of these measures may have a positive impact on inclusion, as national and subnational governments are prioritising vulnerable people and neighbourhoods. Measures such as investing in social and/or affordable housing construction through direct investments and/or subsidies and other financial support to low-income households will likely go a long way in enhancing inclusion, as long as governments 1) expand the supply of affordable and social housing so that more people can access high-quality dwellings and 2) take the necessary measures to target support for housing to ensure that it reaches the households who need it most.

That said, there is a risk in focusing too narrowly on housing construction (dwellings) and not the living environment. The pandemic highlighted deficiencies in both; many people, especially in low-income groups, lack not only adequate housing, but also street lighting, paved roads, access to basic services and access to green areas for leisure and physical activity (for example). It is unclear whether funds are also being allocated to urban regeneration and improvement. Without good planning, measures such as housing construction programmes, grants or loans for buying or building a new home or simplification of procedures for housing construction permits could also exacerbate urban sprawl. The challenge for some national and local governments is to avoid sustaining economic recovery through mass housing construction programmes in the urban periphery, which has been shown to undermine urban accessibility and limits economic opportunities for low-income households.[80] Governments' objectives of increasing access to housing, reducing housing costs and supporting homeownership could lead to less compact urban form if preference is given to single-family homes, particularly in peripheral areas. Even inclusion could be undermined if the supply is too limited, which could inflate prices. If subsidies for affordable rental housing or grants for buying new homes are not properly targeted, they could end up going to higher-income households, resulting in less inclusion.[81] Governments could ensure that housing construction programmes are accompanied by measures to encourage densification by easing land use restrictions that prevent it, particularly in low-density areas close to city centres. Increasing the flexibility of the land-use planning system could potentially prevent further sprawl, but to ensure some form of control, governments may need to issue incentives to compel private actors to pursue desirable patterns of development – for example, through the tax system.[82]

> The construction sector is a bellwether for a country's economy, so investing in home upgrades would stimulate the industry, regenerate other industries and contribute to achieving net-zero targets.

The housing sector, together with transport, seems to dominate green recovery efforts in countries such as Germany, Japan, South Korea and the UK. Heat, cooling and lighting for buildings, including homes, accounted for about 28% of all energy-related CO_2 emissions worldwide.[83] Investing in more energy-efficient new buildings and retrofits of existing buildings has the potential to create jobs, meet social objectives and contribute to tackling climate change. In the UK, for example, the housing sector is responsible for 19% of GHG emissions and the business sector for 18%.[84] Thus, targeting the housing sector in the recovery plans could not only improve and increase the country's housing stock, but create 50,000 jobs over the next two years and 150,000 more by 2030 while saving £ 7.5 billion in energy costs nationwide.[85] The construction sector is a bellwether for a country's economy, so investing in home upgrades would stimulate the industry, regenerate other industries and contribute to achieving net-zero targets.

It is important to note that housing programmes should not focus only on new construction, but also on upgrades and retrofits to reduce energy demand. In the UK, it is expected that 80% of homes that exist today will still be lived in by 2050.[86] In Mexico, roughly 80% of housing investment needs are for improvements and expansions.[87]

Other housing measures include short-term and crisis management responses, intended to alleviate the hardship during the pandemic. Rent freezes, eviction and foreclosure moratoria and special emergency loans to construction companies are some of the measures national governments took to minimise the impact on low-income households. They would not directly affect 3C goals as much as they have the housing market, but in the short term, they may contribute to inclusion by protecting vulnerable populations. However, if they are maintained for a long time or are not properly phased out, they could have implications for inclusion. For example, if restrictions on evictions for tenants who cannot pay the rent are in place for a lengthy period, they may create distortions in urban-related policies, such as limiting the offer in the rental housing market.[88] A limited housing offer may not only increase prices (rental and purchase) but it may also lead to segregation, sending lower-income households to the urban periphery, as has happened in several countries over the years.[89]

Table 5: Housing-related measures to respond to COVID-19 included in the fiscal recovery packages

MEASURES	Impact on urban development			
	Compact	Connected	Clean	Inclusive
Short-term alleviation measures				
Eviction and foreclosure moratoria or direct support to pay for rent				green
Rent controls	orange			green
Fiscal transfers to local authorities to support payment of housing benefits			green	green
Special emergency loans for housing construction companies	orange	orange	orange	orange
Long-term recovery measures				
Credits and/or subsidies for social housing acquisition*	orange			green
Subsidies or tax incentives for affordable rental housing*	orange			orange
Housing construction programmes	orange	orange	orange	orange
Housing improvement programmes via vouchers or subsidies (generally with green technologies).	orange		green	green
Simplification of procedures for housing construction permits	orange	orange	orange	orange
Retrofitting public sector buildings and green housing programmes	green	green	green	green

Notes: *These are both short-term alleviation and long-term recovery measures.

Green means that the measure in the row supports progress towards the objective in the column; orange means that the measure in the row may either support or hamper progress to the objective in the column, depending on the context; pink means that the measure in the row hampers progress towards the objective in the column; white means no known effect.

At the local level, cities adopted measures to respond to the short-term impact of the crisis, such as providing shelter for the homeless, but they have also adopted longer-term measures to bridge the gap in housing supply and increase access to affordable and adequate housing, mostly for lower-income people (Box 4). An important aspect of these initiatives is that they are seen as a source of job creation and meet social policy objectives. Even more, in some cases they are part of urban improvement initiatives to make the most of existing infrastructure, such as transport. This could be a positive development, as using subsidies to incentivise housing development with higher density/floor-to-area ratio and with better access could result in less sprawl and denser development. Access requirements can increase inequality through housing cost overburden, but this can be capitalised through higher grants and subsidies.

BOX 2   **City initiatives for affordable housing construction**

- **Bogotá** (Colombia) expects to conduct urban and real estate projects for the generation of employment and promotion of economic activities. This includes the maintenance of environmental sustainability, development of a technological conversion fund and the promotion or urban and peri-urban agriculture.

- **Liverpool** (UK) has developed a £1.4 billion recovery plan that includes the development of more than 200 new modular homes and community centres and the renovation of 4,000 homes for vulnerable households in deprived neighbourhoods. The city government expects the plan will also contribute to creating 12,000 construction jobs.

- **Mexico City** is investing US$1 billion to create around one million jobs in the construction sector covering public infrastructure and social housing. The city government plans to redevelop 13 urban corridors through housing projects, mostly housing improvement projects and new social housing units in areas with good public transport connections. The strategy builds on the resources already committed for mobility projects announced before the COVID-19 pandemic, such as a new bus rapid transit (BRT) line and two cable bus lines (cableways).

- **Yokohama** (Japan) is increasing subsidies to the owners of rental apartments for vulnerable residents to reduce rent for tenants whose income has diminished because of the pandemic.

- **Vienna** (Austria) has announced seven new municipal housing sites with 1,000 apartments to be built in the coming years across the city to create high-quality and affordable units in attractive residential environments. Future districts will be provided with pedestrian zones, green spaces, and sports and cultural facilities within walking distance.

- **Lisbon** (Portugal) aims to cut the number of Airbnb-style short-term rentals to boost affordable housing in the city centre by giving landlords tax incentives. This could encourage workers to return to live in the city centre after being priced out by a tourism boom.

Source: OECD (2020) Cities policy responses, at http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/ For Lisbon: https://www.euronews.com/2020/07/08/lisbon-mayor-floats-plans-to-turn-airbnb-rentals-into-homes-for-key-workers

LAND USE POLICY REFORM, A KEY PILLAR OF 3C+ URBAN DEVELOPMENT, IS LARGELY ABSENT FROM RECOVERY MEASURES

National recovery packages do not make reference to land use policies, which are closely related to transport, housing and infrastructure development. The reason may be that land use is predominantly a local matter, though in some countries, there may be guiding land use plans prepared by regions or through inter-municipal cooperation. Still, national governments can use tax policy to incentivise certain desirable land uses and influence patterns of development, but they have yet to

do so as part of COVID response. For example, once the pandemic is over, higher fuel taxes may be used to make it more costly to use land for housing in distant locations which necessitate long commutes. This could encourage more compact and transport-oriented development. Subnational governments could promote the use of property taxes in a way that differentiates between desirable and undesirable land uses. However, such policies depend on the specificities of the country's national goals and recovery packages.

Land use policies, including national frameworks for spatial planning and infrastructure development, have long been identified as critical to compact, connected and clean urban development. Ensuring that national and state level planning, fiscal incentives and grants for strategic infrastructure development a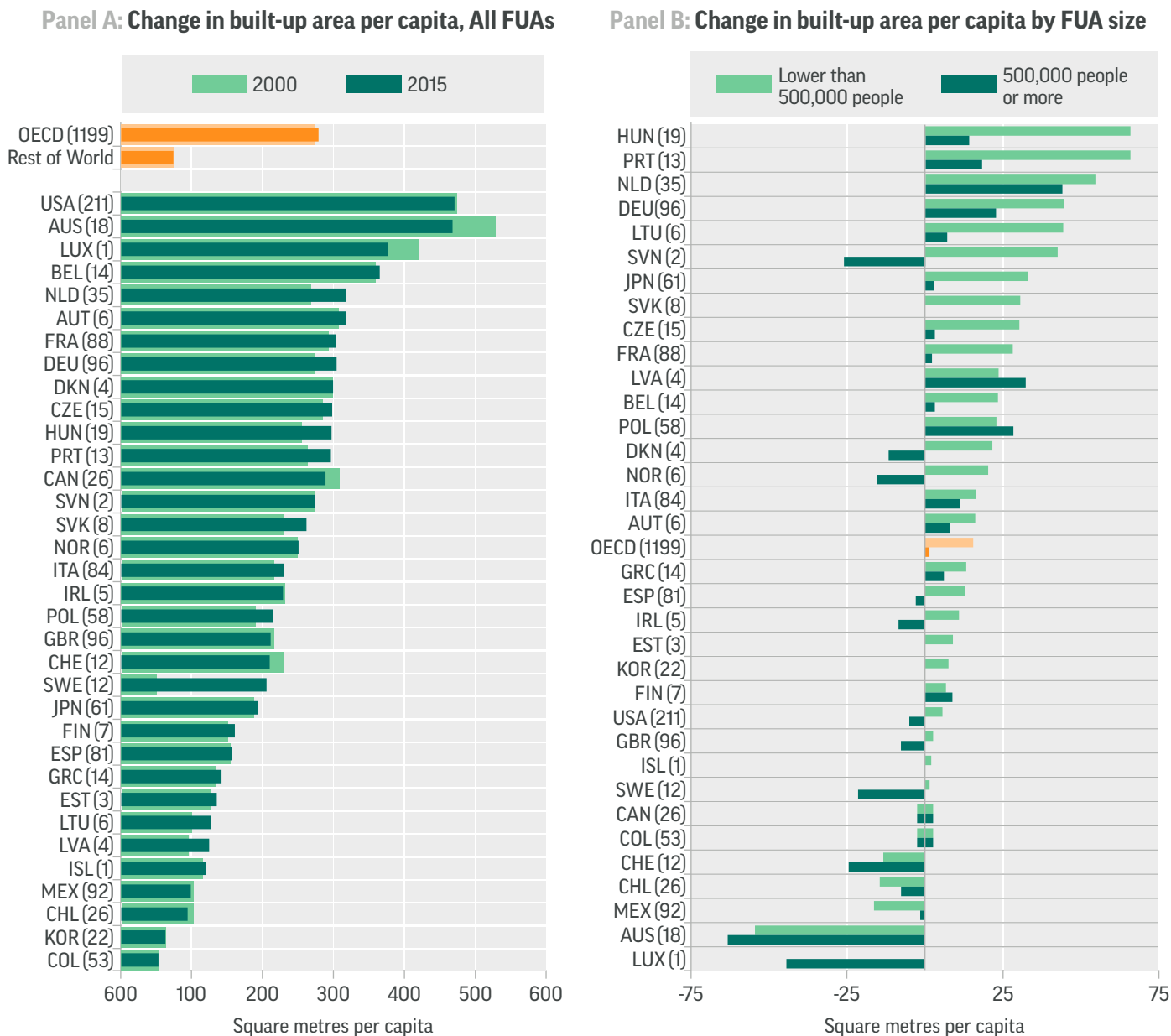re aligned with reducing the rate of greenfield urban development has long been a central component of sustainable spatial development. Numerous initiatives and reports by the United Nations, the European Union, the OECD and individual national governments highlighting the risks of urban sprawl and associated reduction of natural habitats are indicative of this key concern.[90]

Land use policies have long been identified as critical to compact, connected and clean urban development.

However, even in wealthier OECD countries with stagnating population growth, the rate of urban expansion is extremely high (see Figure 2). Put differently, most functional urban regions suffer from de-densification and, with it, a loss of the social, economic and environmental benefits of compact urban development. For instance, in Germany, the daily urban land take remains almost double the official national target of 30 hectares per day – a goal established in the early 2000s.[91] Even more surprisingly, the ongoing neglect of more meaningful and sustainable land use policy continues to be evident in recovery measures. This is despite official policies of "building back better" which recognise that only good urban design and development can address the climate emergency while also reducing future pandemic risks.

Figure 2. Effects of COVID-19 restrictions on global emissions.

Panel A: Change in built-up area per capita, All FUAs

Panel B: Change in built-up area per capita by FUA size

Source: OECD 2020

5. Local governments' fiscal and planning capacity

The COVID-19 pandemic is testing the capacity of national and subnational governments to implement emergency responses and design long-term recovery measures, as they have to work in new ways and new contexts. Local governments have been at the forefront of COVID response, which entails higher spending, but have also seen tax revenue decline, limiting their fiscal capacity. Table 6 shows that four out of the nine countries analysed issued emergency measures to support local governments and make up for a fall in revenues. This was important for two reasons: first, local governments are responsible for the provision of essential public goods such as health, public order, safety and social protection; second, they are large employers and could play a stabilising role by serving as a buffer from the impact of reduced economic activity.[92]

Table 6. Measures to support local governments included in the fiscal recovery packages

EMERGENCY AND LONG-TERM RECOVERY MEASURES	China	Colombia	Germany	Japan	South Korea	Mexico	South Africa	United Kingdom	United States
CAPACITY OF LOCAL PUBLIC ADMINISTRATIONS									
Emergency measures									
Suspensions, cancelations or assumptions of subnational governments' debt repayments	✓							✓	
Cover revenue shortfalls of local governments			✓					✓	
Support state and local governments to pay for public services								✓	✓
Long-term recovery measures									
Bidding for grants for investment projects from national funds to finance green and digital infrastructure projects								✓	
Support to design and improve local development plans and land use plans		✓			✓	✓		✓	
Measures to improve tax and spend efficiency						✓			

ENHANCING THE CAPACITY OF LOCAL ADMINISTRATIONS IS ESSENTIAL TO IMPLEMENTING NATIONAL RECOVERY PACKAGES

Fiscal stimulus recovery plans have to be implemented by and with the support of local governments. However, COVID-19 has largely stretched the administrative and managerial capacity of local public administrations. In Poland, for example, subnational governments plan to reduce investment by 10–30% due to municipalities' weakened financial base. The Polish government expects a decrease of 15% in revenue from corporate income taxes, 11% from personal income taxes and 4% from real estate taxes. The total income decrease is expected to be PLN 9 billion (about US$2.4 billion).[93] This reduction in income will likely affect the capacity of local governments not only to provide basic services, but to pursue investments in infrastructure, unless they obtain external financial assistance.

At the start of the pandemic, national governments adopted measures to help local governments make up for shortfalls in revenue from taxes, fees and other sources. Otherwise, any shortfall would have to be offset by spending cuts or tax increases, either of which could impede the economic recovery. At the same time, local governments have incurred significant new costs from COVID-related measures. The US Congress approved around US$125 billion to state and local governments for education, health, public transit and roads, but it does not include any general aid to states and localities to cover revenue loses. This issue of aid to state and local governments is likely to linger, as these governments continue to face higher demands on spending because of the pandemic, and revenue losses in some states are likely to exceed any federal aid received. The German stimulus package does include measures to cover local governments' revenue shortfalls.

Several fiscal stimulus packages include measures to improve the local governments' investment and planning capacities (Table 7). Improving their investment planning capacity, access to additional sources of funding and strengthening their capacity for development planning is essential if they are to fulfil the objectives of the recovery packages. Developing stronger local development plans and land use plans would have a positive impact on building 3C+ cities, as how land is used affects urban factors such as access to clean water, the length of daily commutes and even the possibility for climate change adaptation. Helping local governments improve their tax collection does not necessarily mean raising taxes, but rather ensuring that more people pay their share of existing taxes.

It is worth noting that none of the fiscal recovery packages included measures to help local governments improve their workers' competences and skills to implement recovery measures. The support focused on the revenue side without considering the human resource management aspect. For example, not all public services are delivered by cities directly, so local public employees need to have the skills to design, manage and oversee contractual arrangements with other (private) organisations. Local development, transport and land use planning require

engaging with citizens, so local officials need to develop or improve their skills to engage effectively with citizens and other stakeholders. Digitalisation demands that officials be aware of and familiar with the use of new technologies for service delivery. Without enhancing the skills and competences of local public employees, cities may struggle to implement national recovery measures relevant to achieving 3C objectives.

Table 6. Measures to increase the capacities of local governments

MEASURES	Impact on urban development			
	Compact	Connected	Clean	Inclusive
Short-term relief measures				
Suspensions, cancelations or assumptions of subnational governments' debt repayments				🟧
Cover revenue shortfalls of local governments				🟩
Help state and local governments pay for public services				🟩
Long-term recovery measures				
Bidding for grants for investment projects from national funds to finance green and digital infrastructure projects	🟧	🟧	🟩	🟧
Support to design and improve local development plans and land use plans	🟩	🟩	🟩	🟩
Measures to improve tax and spend efficiency	🟩	🟩	🟩	🟩

Note: Green means that the measure in the row supports progress towards the objective in the column; orange means that the measure in the row may either support or hamper progress to the objective in the column, depending on the context; pink means that the measure in the row hampers progress towards the objective in the column; white means no known effect.

6. Conclusion

COVID-19 stimulus and recovery packages could provide key opportunities for governments to accelerate the transition towards compact, connected, clean and inclusive cities, but many of those opportunities have yet to be seized. The latest analysis on Vivid Economics' Greenness of Stimulus Index shows that of US$17.2 trillion in emergency response and recovery packages adopted as of June 2021 in the G20 and 10 additional countries analysed, 28% has gone to environmentally sensitive sectors (energy, transport and waste – the most relevant to urban emissions – as well as industry and agriculture). Overall, the analysis found investments in those sectors would have a net negative environmental impact in 15 of the G20 economies and half of the other countries.[94] The reason is that instead of accelerating the transformation of those crucial sectors, many of the approved investments would help entrench fossil fuel dependency and "business as usual" practices.

The health, social and economic crises created by COVID-19 have highlighted critical problems in cities, including structural inequalities and major shortcomings in urban infrastructure, neighbourhood design and housing quality. Public transport systems have seen ridership – and revenues – sharply decline, and countries' efforts to sustain those systems, though helpful, may fall far short of what is needed. COVID-19 is also accelerating changes in cities, such as digitalisation and the growth in teleworking, and posing new challenges to governments, which need to expand their employees' capacities both to respond to the immediate crises and to plan and manage longer-term processes to improve cities.

While it is too early to know what some of the longer-term legacies of the pandemic will be when it comes to urban sustainability, national governments have already spent unprecedented sums of money in response to the crisis, and the stimulus packages now being rolled out will reshape economies and cities in fundamental ways. Part 2 of this paper examines key opportunities for national governments to make the most of COVID-19 recovery investments to accelerate the transition to 3C+ cities, with a focus on urban accessibility and its role in stimulating economies and making them more inclusive.

PART 2
Policy priorities for urban accessibility in the 2020s

It is not too late for national governments that wish to improve urban accessibility – and help cities become more compact, connected, clean and inclusive – to incorporate key measures in their COVID-19 recovery packages. They can also seize opportunities that arise in fiscal, economic and sectoral policies as well as infrastructure budgets in the next several years. The sections that follow identify six policy areas that are particularly crucial for urban accessibility, as well as two policy "blind spots" that merit special attention: digital connectivity and urban freight and logistics.

7. Urban accessibility as leverage for rapid decarbonisation

Work by the Global Carbon Project shows that a drop in road traffic during lockdowns was centrally responsible for the 6% decrease in global GHG emissions seen in 2020.[95] Similarly, an IEA analysis found the transport sector accounted for well over half the overall drop in emissions.[96] Across the European Union, where countries mandated strict lockdowns and limited movement, CO2 emissions decreased by 10% in 2020 compared to 2019, with transport accounting for as much of 60% this drop in some countries.[97] This highlights how much government interventions can affect transport systems and mobility behaviour and has important implications for climate action.

Though the lockdowns carried considerable economic and social costs, the road traffic reductions generated significant and progressive benefits, including reductions in crashes and related injuries and fatalities, as well as improved air quality and increased physical activity and community cohesion. Urban knowledge economies arguably did surprisingly well coping with a significant reduction in physical mobility. The challenge for governments now is to find ways to achieve similar reductions in road traffic outside the context of a crisis and without significant economic or social costs. This is an urgent agenda, given that transport activity has already recovered to pre-pandemic levels in many countries, and emissions for 2021 are on track to exceed 2019 levels.[98]

Shifting the emphasis from a focus on mobility towards better urban accessibility provides a powerful policy framework to decarbonise in a way that also promotes more inclusive urban development. It is now about implementing the priority policy instruments and corresponding investments that will get us there.

National and city governments will have to prioritise regulatory action over mere incentivisation to provide clear policy signals that will enable a rapid upscaling of behaviours, technologies and infrastructures that are compatible with the most ambitious decarbonisation goals.[99] Like countries' COVID-19 responses, policies to address the climate emergency will have to differentiate what can be achieved tomorrow, within a year, within a decade or over several decades. The sections that follow show how national governments can build on recent trends and developments to improve urban accessibility – through direct action and by supporting local governments' efforts.

REALIGNING NATIONAL TRANSPORT POLICIES AND BUDGETS

National policies and budgets play a critical role in shaping urban mobility patterns. National governments provide crucial funding for high- and low-carbon transport infrastructure alike: from roads and highways to electric vehicle (EV) charging stations, public transit system expansions and new bike paths. As discussed in Part 1, many countries' COVID-19 stimulus and recovery packages have included significant transport investments – both to help transit systems facing major shortfalls in revenue and to fund "shovel-ready" projects that would create much-needed jobs while improving transport infrastructure. Governments need to seize these opportunities to promote transformative change to rapidly decarbonise urban transport and make cities more accessible. And even after the COVID crisis has passed, they can use the power of the purse and their key role in setting standards and shaping economic incentives to keep moving the transport sector in the right direction.

There has been a big push by national governments (e.g. China/Germany) to prioritise clean vehicle policies in their recovery efforts, in part to support existing domestic industries. While the electrification of existing vehicle fleets is an important priority, it will need to be accompanied by the decarbonisation of the grid and an expansion of adequate charging infrastructure. Perhaps an even more important concern, however, is that such strategies risk perpetuating the dominance of individual car use and that the wider negative impacts of cars on urban environments remain unaddressed. The reality is that decarbonisation efforts are still being undermined by a significant increase in overall transport demand which cancels out many of the gains of electrification. As the International Transport Forum highlights, while for parts of the transport sector (e.g. intercity travel and goods movement) a dominant focus on decarbonisation may be the right strategy, in cities it is critical that such efforts are complemented by shortening travel distances, a shift to non-motorised modes and an increase in public transport use.[100]

Key priorities include expanding established sustainable travel, such as walking, cycling and public transport use; rapidly electrifying road transport;[101] and, to the extent that cars are still used, shifting away from individual ownership towards sharing and pooling.[102] In both developed and developing country contexts, there is arguably an overreliance on investments in entirely new infrastructure and

new technologies. While these may be justified in certain contexts, major capital expenditures are not necessarily always the best or fastest way to reduce emissions or improve accessibility. Analysis by the World Resources Institute has shown that only a third of existing nationally determined contributions (NDCs) that address transport acknowledge the importance of policies to avoid unnecessary travel and promote an active shift to existing low-carbon travel modes.[103] A greater focus on policies that target behaviour change could actually lead to significant and immediate impacts. Of course, any such efforts will be more successful if they are accompanied by retrofitting of existing infrastructure (e.g. adding bike lanes to existing roads or adding and expanding sidewalks), coupled with a focus on improving the attractiveness of more sustainable travel choices (e.g. integrated transport apps or real-time travel information at bus stops).

In fact, there are a wide range of win-win policy actions that can create more compact, connected and inclusive cities while also addressing the urgent need for rapid decarbonisation. Table 8 highlights relevant policy instruments that can address this policy agenda and assesses their impact on compact, connected, clean and inclusive cities.

Table 8. Priority transport policy instruments to address the climate emergency

	PRIORITY POLICY INSTRUMENTS
Typical relevance for different levels of government — LOCAL NATIONAL	Reallocate national transport budgets to support a shift to sustainable modes
	Phase out sale of new diesel and petrol vehicles (e.g. UK 2020)
	Introduce zero-emission vehicle mandates (e.g. China 2020)[104]
	Tighten fuel economy standards for private cars and freight vehicles[105]
	Convert fixed vehicle insurance, registration fees and taxes into distance-based fees[106][107]
	New taxes on vehicles by weight and emissions (e.g. France 2020)[108]
	Eliminating fossil fuel subsidies and introduction of carbon price for transport fuels (Germany 2021)[109]
	Invest in charging infrastructure for electric cars, buses and freight vehicles (e.g. Canada).[110]
	Implement transport pricing reforms, including efficient road and parking pricing
	Require or encourage commute trip reduction and school transport management programmes[111]
	Establish vehicle travel reduction targets and policies to achieve those targets[112][113]

COMPREHENSIVE HOUSING AND LAND USE POLICY REFORM

The COVID-19 pandemic has exacerbated pre-existing challenges in access to adequate affordable housing, with low-income groups experiencing the most difficult conditions. Housing is key in responding to the economic and social crisis brought about by COVID-19, but it needs to be considered as part of a broader urban and social policy strategy to tackle the crisis. Governments should focus not just on housing construction, but on building communities and neighbourhoods where residents have access to the opportunities, services and amenities they need to thrive.

It is crucial to provide a wide array of housing solutions appropriate for people at different income levels and in different life situations. For some, homeownership will be best, while many others would do best renting, provided adequate tenant protection laws are in place. The living environment is as important as the dwelling itself, as it influences quality of life, access to services and amenities, and it can promote or hinder social cohesion. Housing quality standards should be defined in a way that promotes households' autonomy and well-being. Energy efficiency needs to be a priority as well to reduce GHG emissions as well as ease the cost burden on households.

Given the considerable risks of ongoing urban dispersal, sprawl and decentralisation, including in richer OECD countries with stagnating population growth, national governments will have to play a key role in counteracting urban de-densification. This is particularly urgent given that existing horizontal growth may be further accelerated by new anti-urban attitudes and desires for suburban living resulting from the pandemic and shifting work patterns.

Above all, national policy-makers must ensure that spatial development and locational decisions are based on true costs to society and stop providing direct or indirect subsidies for dispersed urban development. It is also crucial to operate within national limits for the amount of greenfield land that can be converted to urban use, while providing more flexibility for the intensity of land use. National housing policy reforms are likely to be needed to help ensure that any such changes do not reduce access to affordable housing or lead to increased costs of accessing urban opportunities.

Table 9. Priority policy instruments to facilitate comprehensive housing and land use policy reform[114]

PRIORITY POLICY INSTRUMENTS

<table>
<tr>
<td rowspan="5" style="writing-mode: vertical">Typical relevance for different levels of government   LOCAL   NATIONAL</td>
<td>

Reform development policies and planning practices to favour affordable, compact infill housing (basic townhouses and apartments)
- Increase allowable densities, building heights and types in walkable urban neighbourhoods, including in suburban areas
- Reduce or eliminate parking minimums and require property owners to unbundle parking
- Reduce development fees and approval requirements for lower-priced infill

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Design fiscal incentives to foster compact and inclusive cities
- Redesign property taxes to incentivise more efficient land use through higher-density housing development and greater differentiation of property taxes to encourage desirable developments
- Discourage low-density housing construction at the periphery by adopting a development tax or impact fees to internalise the real cost of sprawl for property developers
- Use land use regulations to promote more proactive policies for densification, such as the introduction of transferable development rights and incentives for compact development on brownfields
- Concrete policy instruments: split rate property taxes or vacant urban land tax; impact fees; development tax; incentives for higher density or accessibility

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Review housing policy to ensure coherence with environmental and social policy objectives
- Explore alternatives to mass social housing production, such as self-built housing and upgrade programmes
- Analyse the convenience of adopting the "social production of habitat" approach as part of national housing policy
- Revise the standards for social housing construction to ensure that it meets environmental requirements and is multifunctional to contribute to well-being

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Unlock the potential of the rental market
- Establish clear and balanced tenant–landlord regulations to enhance transparency and ensure that both parties have equal access to information and legal recourse
- Develop measures to support social rental housing and ensure adequate tenure protection without hampering residential mobility
- Concrete policy instruments: inclusionary zoning, perpetual use of social housing for rent in central areas

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Strengthen institutional capacity and build coherent policy frameworks
- Craft national urban policies that align different ministries and levels of government behind a shared vision for cities, and design policy frameworks that enable subnational governments to promote denser, mixed-use development
- Introduce mechanisms for better inter-municipal collaboration for both demand-side and supply-side policies
- Increase local capacity to collect property taxes by reviewing tax exemptions and strengthening national systems to identify taxable properties and assess property values
- Concrete policy instruments: national policy on infill development; reliable and updated information systems; national housing legislation to encourage rental protection; inclusionary zoning; minimum requirements for housing provision; increased local capacity for tax collection

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HYPER-LOCALISATION AND THE 15-MINUTE NEIGHBOURHOOD

A growing number of cities around the world, including Paris, Milan, Singapore, Melbourne and Seattle are now embracing a model of radical accessibility that aims to bring as many land uses as possible into a single area. The goal is to create cities where all residents can meet most of their daily needs within a short walk or bike ride (and/or public transit trip) from home – and, in doing so, ensure that urban services and opportunities are available all across the city.[115] Though the core ideas and policies underpinning the 15-minute city are not new, the mobility limitations imposed by the pandemic greatly increased global interest in the concept as a way to improve liveability, reduce carbon emissions and rebuild and future-proof urban communities.[116] Local lockdowns not only enabled people to familiarise themselves with their neighbourhoods, but also highlighted the importance of ensuring more equitable access to key services in close proximity to everyone's homes. This has already had a lasting impact on how people move in cities. For example, London experienced a 25% increase in short distance trips between October 2019 and June 2021, with many people less inclined to travel long distances if they could avoid it.[117]

> **While daily needs may largely be met locally, enabling individuals from all income groups to access a diversity of opportunities across the city should be a priority.**

The crisis has certainly offered an opportunity to rethink land uses and the spatial organisation of cities. Research has shown that over 40% of workers across both the European Union and the United States conducted at least some of their work at home as a result of the pandemic.[118][119] Even as the pandemic subsides, remote working is likely to remain to a significant degree.[120] With more people working at least partially from home, many businesses have downsized their offices in downtown cores. We may also see the emergence of local hubs and satellite "serviced" office spaces in more traditionally residential neighbourhoods.[121] These trends are likely to create new economic opportunities in neighbourhoods that were mainly residential, giving a boost to local businesses and helping revitalise smaller commercial areas.

At the same time, vacated office spaces in city centres may need to be repurposed to avoid the development of "doughnut cities" with hollowed-out urban centres. While demand for office space has rebounded from the significant collapse experienced in 2020,[122] it remains too early to know how these trends will play out long-term. It is likely that there will be an enduring reduction in demand and a shift to more hybrid and flexible working, with potential knock-on effects for the many ancillary services (e.g. dry cleaners, hospitality) that rely heavily on the commuter economy.[123] Some commercial spaces could potentially be converted to provide much-needed affordable housing, which might also enable businesses that catered to office workers to adapt by serving a new clientele.

To be successful, a 15-minute neighbourhood requires sufficient density and mix to support commonly used services and activities, including shops, schools and parks. To be equitable, these highly accessible and opportunity-rich areas need diverse and affordable housing options, so people at all income levels and those with special needs can also live there. This is likely to require land use policy reforms to allow denser development, including multi-family housing and rentals and a focus on ensuring that investment in improved services is not concentrated in already affluent areas. For that, careful assessments of existing service coverage across diverse neighbourhoods will be needed to ensure any interventions actively reduce rather than compound social divides and inequalities and avoid the creation of walled enclaves for the rich.[124] This also highlights the importance of planning for these changes across all scales, from the hyperlocal block level to the wider metropolitan area, and supporting the creation of more polycentric urban development models.

Embracing 15-minute cities will also require rethinking public and active transport planning. The dominant model in many cities are "hub and spoke" transport and cycling networks that connect residential areas to the urban core where employment opportunities are clustered. Transport systems have long been optimised for this form of work commute – often ignoring the travel needs of other groups, such as women, that have domestic and caring responsibilities.[125] A new emphasis on creating better connections both within and between neighbourhoods could therefore also play an important role in improving accessibility for those making more complex journeys. While daily needs may largely be met locally, enabling individuals from all income groups to access a diversity of opportunities across the city should be a priority. This should also be a consideration in transit-oriented development, which will remain an important complementary strategy to connect neighbourhoods.[126] Of course, this focus on local reconfigurations should not come at the expense of urgently needed regional investments, including integrated metropolitan transport systems to ensure accessibility for outlying areas (see Section 7.6).

For large and sprawling cities where hour-long commutes are the norm, 15-minute neighbourhoods might seem utopian. But many of these cities (e.g. Mexico City) actually have the most to gain from an increase in mixed land uses and decentralisation of services. By challenging the prevailing planning orthodoxy of separating residential areas from workplaces and services, cities can start to break the cycle of sprawling car dependency, regenerate deprived neighbourhoods and provide more equitable access to opportunities.[127]

Table 10. Priority policy instruments to facilitate hyper-localisation and the 15-minute district

PRIORITY POLICY INSTRUMENTS
Reallocate national transport budgets to support a shift to sustainable modes
Invest in more orbital transport systems that connect neighbourhoods, rather than just the urban core
Reform the planning system to include climate compatible accessibility metrics for developments (e.g. proposal in London for Climate Safe Modes Accessibility Index)[128]
Provide support for low-income residents and invest in public and cooperative housing to ensure they are not priced out of neighbourhoods[129]
Enable cities to implement efficient road pricing (ideally using distance-based charges)
Integrate 15-minute neighbourhood plans into existing strategic urban development and land use plans[130]
Develop inclusive zoning policies that promote affordable infill housing and mixed-use development and enable the flexible use of buildings and spaces, while ring-fencing certain real estate for commercial uses to preserve active street life[131]
Implement traffic calming, traffic speed reduction programmes and vehicle restrictions in urban neighbourhoods
Reduce or eliminate parking minimums and require property owners to "unbundle" parking so residents don't have to pay for parking they don't need
More efficiently manage and price on-street parking spaces
Reallocate road space from cars to more resource-efficient modes and other city amenities[132][133]
Invest in shared mobility hubs to facilitate access via a diversity of sustainable transport modes
Introduce participatory budgeting for local initiatives to enable communities to co-design aspects of their 15-minute neighbourhood
Improve data collection (including GIS mapping and use of accessibility indicators) to support analysis of the distribution of neighbourhood-level amenities, businesses and services

Typical relevance for different levels of government — LOCAL NATIONAL

NEW URBAN MOBILITY AND LAST-MILE CONNECTIVITY

Two emerging trends that are rapidly transforming urban mobility across the world are micromobility solutions on the one hand, and shared motorised mobility on the other. Both offer attractive alternatives to private car use over shorter and longer distances, respectively, and play an important role in facilitating greater urban accessibility.

Micromobility has proliferated on urban streets in recent years – particularly bike-sharing and e-scooters. These modes were growing rapidly in 2019, but their use slowed at the peak of the pandemic alongside a concurrent collapse in the valuation of leading private service providers.[134] Despite this, projections suggest that, post-COVID, micromobility will play an increasingly important role in enabling first- and last-mile connectivity as part of multimodal and car-free transport systems.[135] Despite their potential to reduce congestion, air pollution and carbon emissions and improve accessibility, there are still questions around whether e-scooters in particular could generate unnecessary trips or displace less energy-intensive and more physically active modes, such as walking and cycling.[136] Governments will need to proactively regulate the space and work closely with private sector providers to ensure that the benefits to urban communities are maximised. This may include policies to restrict the use of scooters to roads or cycle lanes and to reduce their speed and power output.

Sharing is also playing an increasingly important role in the use of cars with app-based shared mobility services providing on-demand, point-to-point mobility. This includes both ride-sharing services, such as Uber and Lyft, and car-sharing services, such as ZipCar. Though there is evidence that ride-sharing services can compete with public transit and also increase congestion in high-demand areas[137], they also improve urban accessibility by connecting places – and people – that are not served well by transit. They also make it easier to forgo car ownership and reduce the need for parking; if pooling options are more widely used, they can also reduce total car trips.[138]

An important focus in the coming years will be the electrification of shared vehicle fleets. Given that these vehicles tend to spend less time parked (and therefore able to charge), and "range anxiety" is still seen as one of the major deterrents for drivers to make the switch, investments in rapid charging infrastructure for shared vehicles will be an important priority.[139] At the same time, targeted subsidies or other support schemes need to be put in place to remove the significant financial barriers preventing drivers from upgrading their vehicles.

When it comes to the ability of these new urban mobility services to drive improved urban accessibility, integration with existing modes and the established public and active transport network will be particularly important. This will require a fundamental rethinking of urban mobility away from decision-making and funding models that are focused on individual modes and encourage competition for passengers. Instead, a new approach is needed that thinks about door-to-door mobility and includes the broad spectrum of options: from mass transit to on-demand and shared mobility.

Table 11. Priority policy instruments to facilitate new urban mobility and last-mile connectivity

PRIORITY POLICY INSTRUMENTS
Support the development of metropolitan transport authorities that can facilitate integration of all urban modes
Develop multimodal mobility apps enabling users to access new mobility offerings alongside traditional public transport services to make more informed choices[140]
Implement public parking and curb management that favours higher-value uses (deliveries, passenger pick-up/drop-off, people with disabilities) and space-efficient modes (bike and bus lanes) over lower-value uses and space-intensive modes
Establishing a clear regulatory framework, including operating license fees, device caps, designating dedicated parking bays for dockless vehicles, mandating that e-scooters use bicycle lanes rather than sidewalks and regulating speed and power output
Invest in the development of shared micromobility offerings over individual ownership and prioritise fully or partially active forms of micromobility
Provide incentives for companies to locate new micromobility offerings in less connected neighbourhoods to enhance transport equity and accessibility[141]
Provide financial support to drivers of ride-sharing vehicles to invest in EVs
Establish clear policies and standards regarding "data as a service"", data sharing and the use of real-time travel data collected through these new mobility providers (e.g. MDS in Los Angeles)[142]

Typical relevance for different levels of government — **URBAN   NATIONAL**

REALLOCATION OF ROAD SPACE AND TACTICAL URBANISM

The pandemic led to the rapid reorganisation of urban street space, as sidewalks were widened, roads were pedestrianised and pop-up cycling lanes emerged almost overnight to accommodate the urgent need for social distancing. The many empty streets during lockdowns also highlighted how much public space in cities is normally taken up by cars. This huge global experiment in tactical urbanism, meaning the rapid and low-cost adaptation of the public realm, proved to be a powerful tool for governments to push back against the dominance of cars and create more space for people to walk, cycle, live and play safely. In the 18 months since the start of the pandemic, European cities created new cycle lanes, streets with traffic-calming measures and car-free zones collectively spanning more than 1400 km.[143] While some of the changes were initially meant as temporary arrangements in response to the crisis, there is clearly now a window of opportunity to make these physical and behavioural changes permanent and ensure that they become integrated into strategies for more sustainable urban and transport planning. Support from national governments will be critical to ensuring these early successes can be scaled.

There is a growing consensus that future investments should focus on creating slow, safe and shared streets that prioritise pedestrians, cyclists, high-quality public spaces and green infrastructure.[144] Another important focus is greater priority for public transport, including dedicated lanes for buses and improvements around public transport stops.[145] Thinking about how public transport can be integrated with new traffic-calmed or traffic-free areas will be particularly important to ensure that access to these urban spaces remains high for all urban residents.

Of course it is important to carefully monitor and evaluate any new measures to ensure that they are having the desired impacts and to minimise negative externalities. One of the benefits of tactical urbanism is that it can be both spatially and temporally flexible, allowing cities to iterate and improve original designs. While some more ambitious transformations of the streetscape have attracted criticism from vocal minorities, evidence suggests that these measures tend to have broad public support, very rapidly improve road safety and local air quality and actually increase footfall for businesses.[146,147,148]

Table 12. Priority policy instruments to facilitate the reallocation of road space and tactical urbanism

	PRIORITY POLICY INSTRUMENTS
Typical relevance for different levels of government **LOCAL NATIONAL**	Grant local governments the power to enforce low-traffic neighbourhoods and make decisions about pedestrianisation and other initiatives, such as play streets (e.g. UK 2020)
	Provide direct funding to local governments to support tactical urbanism interventions and road space reallocation (e.g. UK 2020)[149]
	Update highway codes to ensure a hierarchy of road users that prioritises the most vulnerable users and non-motorised transport modes (e.g. UK Review of Highway Code 2020)[150]
	Implement traffic speed reductions, traffic calming and streetscaping and vehicle traffic restrictions (e.g. Brussels 2020)[151]
	Invest in active and micro-mode (walking, scooters, bicycling, e-bikes and their variants) infrastructure, including dedicated cycle lanes and pedestrianised streets (e.g. Paris, Bogotá, New York, Milan), and bike parking. Priority should be given to low-income areas and neighbourhoods with lower levels of existing accessibility
	Establish measurable performance targets (e.g. percentage of streets to be pedestrianised, new cycle lanes to be built) and clear timelines for accomplishing these
	Remove parking spaces and convert these to other uses, such as wider sidewalks, parklets or additional outdoor seating (e.g. Santiago de Chile, San Francisco, Gurgaon)
	Efficiently price parking, with prices that increase during periods of high demand[152 153]

NEW FINANCE FOR METROPOLITAN-WIDE TRANSPORT

While the rapid acceleration of cycling and walking will, without a doubt, lead to major improvements in local accessibility in many urban communities, this positive development is overshadowed by the unprecedented and enduring drop in public transit ridership.[154] Many cities experienced upwards of 90% ridership reductions in the early days of the pandemic, and as discussed in Part 1, in most cities, transit systems have still not returned to pre-pandemic levels. This has had catastrophic consequences for local transport agencies that have faced a collapse in revenues threatening the long-term viability of many public transport systems.[155] There is also a growing concern that the increase in active travel experienced in many cities mainly reflects a shift away not from driving, but from using public transport. Enduring changes to commuting will also affect public transit ridership and may require a fundamental reconfiguration of existing networks to align with new patterns of how and where people work and live in cities. One of the major priorities for the months and years ahead will be the restoration of trust in public transport systems and increased awareness of their role as drivers of efficiency, liveability and sustainability in cities.

Especially for larger and more sprawling metropolitan areas where cycling and walking are not always feasible modes for people to access jobs and meet other basic needs, public transport plays a critical role in preserving urban accessibility across the wider metropolitan area and preventing an acceleration in private car use. There are considerable risks if governments do not decisively intervene to invest in public transport. Underinvestment in transport systems will lead to a vicious cycle where people will perceive this mode to be less attractive, leading to lower fare revenues, which will, in turn, further undermine the quality of service. Investing in public transport is also essential from an equity perspective, given that in many cities it constitutes the main mode through which lower-income residents are able to access jobs, education and other critical services. For cities that have experienced an increased demand for housing in more suburban locations, the negative effects of urban sprawl can be mitigated by ensuring high quality public transport provision, both within and between peripheral neighbourhoods (See Section 7.3) and as a way to improve connectivity to core employment centres.

Cities and their immediate hinterlands will need support in their efforts to attract people back to COVID-safe public transport, given the central role this mode will have to play in decarbonising the sector and improving accessibility across the wider metropolitan area. One thing that became very clear during the pandemic is that public transport is in fact essential, especially during a health crisis. This has created an opportunity to convince national governments that investing in and supporting public transport is not a cost, but rather an investment that yields immense social, economic and environmental returns in cities. In addition to direct subsidies and support from national government, new financing models will have to be explored, including how cities might cross-subsidise public transport through the use of road pricing and other taxes, such as land value capture instruments.

In many countries, this will require reforms at the national level to empower cities to create sustainable funding streams to support the expansion of public transport. In that context, national government support for the establishment of metropolitan transport authorities will be an important priority. This can help reduce competition between modes and facilitate much closer collaboration within and between the public sector and private franchise holders and operators.[156]

Table 13. Priority policy instruments to facilitate the reallocation of road space and tactical urbanism

	PRIORITY POLICY INSTRUMENTS
Typical relevance for different levels of government — NATIONAL / LOCAL	Support the development of metropolitan transport authorities that can facilitate integration of all urban modes
	Mandate the establishment of integrated urban and transport plans to improve strategic planning
	Provide operational support for public transport authorities to counteract revenue losses and ensure services are maintained to the highest standards
	Reallocate transport budgets at the national level to support public transport investments, particularly in high-capacity modes such as BRT and rail
	Enable the roll-out of road pricing and introduce distance-based road user charging, with fees earmarked for reinvestment in public transport
	Introduce new vehicle ownership taxes and reinvest revenue in public transport expansion
	Reduce or eliminate public transport fares to rapidly increase uptake
	Reallocate road space to create dedicated bus lanes and other transit priority strategies (e.g. bus priority signals)
	Invest in upgrading bus stops and train stations/interchanges (e.g. weather protection, safety, cleanliness, real time travel data) to make the user experience more pleasant
	Increase parking charges and eliminate or cash out free parking provisions
	Supporting the formalisation and modernisation of private sector transport operators (e.g. Mexico City) to provide a better service to low-income and peripheral communities
	Reform fare systems to ensure greater modal integration and cost savings (and eliminate competition between modes)

8. Accessibility 'blind spots' with transformative potential

Two key trends with major implications for urban accessibility have gained prominence during the pandemic: the substitution of transport and mobility with digital connectivity and the increase in e-commerce and home deliveries, resulting in a considerable increase in urban freight. This section explores both trends and policy interventions that could facilitate 3C+ development in these sectors and shares results of two expert surveys aimed at identifying priority actions across both.

DIGITAL CONNECTIVITY

Digital connectivity is a major enabler of social and economic development. If designed to be effective and inclusive, it can also make a considerable contribution to decarbonisation. By reducing the need to travel, digital technologies have great potential to reduce GHG emissions from transport, help establish a green economy and enhance the quality of life in cities and beyond. However, current levels of digital connectivity are lagging behind expectations.

In most of the world, digital connectivity has been left to the market — especially since it was restructured away from basic telephone services in the late 1990s. Today, it is more privatised than most transport systems.[157] The sector also displays very different decision-making structures and potentially less obvious direct policy levers – which themselves differ from country to country.

Given current ownership structures, business models, regulation and power relations, most profit is generated in the content and web platforms and not in the connectivity. Liberalisation of the industry – denationalising telecoms companies, separating regulators from ministries of government, mandating market competition and restricting network interconnection and usage charges – has resulted in low levels of infrastructure investment. Instead, investors have focused on companies supporting digital services, especially entertainment, e-commerce and social media, along with concomitant platform and advertising businesses and a few consumer electronics manufacturers. Telecommunication service companies that were once counted among the most valued companies in the world have been displaced on the league table by Facebook, Apple (a device manufacturer as well as a platform owner and service provider), Amazon, Netflix and Google (known collectively as "the FAANG").

This redistribution and consequent market-shaping has had three key immediate effects. The first was to accelerate the dissemination of online services, especially since the introduction of the iPhone and the rise in mobile internet use. This caused the volume of internet traffic to skyrocket and brought about the third consequence that urgently needs to be addressed: the mismatch between use and infrastructure qualities of technical functionality (speed, capacity, reliability, etc.), economic stability and determinants of access.

Internet traffic has especially been driven by video entertainment and gaming, both through social media (led by Twitter and Facebook) and subscription services such as Netflix, Google's YouTube and Microsoft's Xbox. In the background, the rapid growth of machine-to-machine (or "internet of things") and business data traffic (including payment systems, banking and other financial services transactions) has accentuated what has long been a highly imbalanced picture of usage. While super-profits accrue to the FAANG, driven by advertisers and subscribers, the owners of network infrastructure have largely been relegated to commodity businesses. Although most are obliged by license terms to provide a large degree of access, the legal, economic and engineering structure of the system perpetuates gaps associated with poverty, inferior educational and economic opportunities and peripheral locations. This bifurcated outcome of access and inclusivity has long been known as the "digital divide" – and it persists because of the political, ideological, and power choices we make around digital connectivity. Despite world leaders' calls for a "human rights-based" approach to the internet,[158] policy-makers have made relatively little progress in addressing key issues with digital connectivity that prevent it from realising its full potential to enhance urban accessibility and sustainable, inclusive economic growth.

Five main categories of barriers to digital connectivity can be differentiated: technology, investment, regulation/security, business models, sustainability and social impact. More specific barriers to rapid roll-out of digital connectivity are the logistics of infrastructure implementation,[159] competition issues (entry barriers for newcomers), consensus on spectrum and licenses, spectrum usage, spectrum and infrastructure sharing, lack of centralised infrastructure documentation (across digital, electricity, gas, etc.), lack of market incentives,[160] limitations of public private partnerships (PPPs), local permits and fees for infrastructure roll-out. On the consumer side, the cost of devices and subscription services is the main barrier to more equitable digital access.

Regulators of digital connectivity are spatially blind and are not considering connectivity plans of different cities and particular geographic circumstances.[161] To date, in most of the world, cities have played only a minor role in the facilitation of digital connectivity. Typically, they have just issued construction permits and collected related fees – far less engagement than in transport infrastructure and systems. In some contexts, cities could play a role as facilitators for more competition or via direct involvement in digital infrastructure.

The sustainable implementation of digital connectivity needs to consider several other critical issues. Digital technology is energy-intensive; the internet is already responsible for around 4% of GHG emissions, and it could reach as much as 14% by 2040.[162] Digital connectivity relies on critical infrastructure that needs to be treated as such – its ownership, governance and protocols for activation require particular attention. For example, digital connectivity raises new questions on technology sovereignty, security, robustness and dependence even for advanced economy countries (as can be seen in the outsourcing of data centre and 5G technology alongside related controversies over respective control).

REVISITING THE POLICY AGENDA FOR DIGITAL CONNECTIVITY

National governments need to treat digital connectivity on par with physical transport access. This implies positioning virtualisation requirements and opportunities as an integral part of national transport policy, while establishing digital access as an alternative to physical mobility. The two systems also need to be better integrated, to (1) align and coordinate infrastructure roll-out and maintenance, (2) digitally optimise transport services, routing, pricing and ticketing and (3) improve digital connectivity in transport systems (seamless connectivity, on-board streaming, etc.). This requires governance reforms to join up departments horizontally and different tiers of government vertically. Governments also need to have a full overview of the regulatory framework of digital connectivity alongside a comprehensive understanding of internal and external resources committed to the sector.

The next push for digital connectivity needs to ensure equitable access in line with Sustainable Development Goal 9C,[163] as well as affordability. The aim should be to come as close as possible to establish digital connectivity as right. There are a few examples of elements of this already.[164] Some are in the form of subsidies for specific groups, such as students or public sector workers; others are in the form of free community broadband, commonly at the neighbourhood level. Some argue for universal provision of free broadband (analogous to the public roads system) and investments in digital literacy.[165] As with public transport and walking and cycling infrastructure, it is also crucial to ensure that digital infrastructure is equitably distributed within urban areas. This requires closing significant gaps between wealthier and poorer communities that exacerbate inequality, with particularly severe consequences during the COVID-19 crisis.[166]

> As with public transport and walking and cycling infrastructure, it is crucial to ensure that digital infrastructure is equitably distributed within urban areas.

Digital connectivity could be devised as a quasi-commons dedicated to climate friendly, green development and supported by market activities and private organisations. Digital connectivity as an effective green policy agenda needs to consider both supply- and demand-side matters. It requires the integration of issues of physical network access (availability of connection point – via fibre, masts and satellites – and devices); the management and pricing of bandwidth, data management and storage (data centres, conduits, etc.); and the management of content, platforms and producers.

National governments need to revisit the degree to which governing digital connectivity is centralised vs. devolved to cities and regions. While national standards for setting fees and assessing permits may be advantageous for rapid roll-out, there may be a strong case for certain aspects of digital policy to be addressed at the city level, particularly as they relate to transport policy, urban planning and city design. At a minimum, data devolution will be critical for cities to advance strategic planning and operations on transport and digital connectivity. Cities are also in a good position to address the middle-mile problem of digital connectivity and to act as conveners for a public debate on digital connectivity.

POLICY INSTRUMENTS AND GOVERNANCE ARRANGEMENTS TO IMPROVE DIGITAL CONNECTIVITY

Realising digital connectivity's potential for improving urban accessibility requires ensuring that high-quality digital infrastructure is in place all across urban areas, that users at all income levels (and also elders and people with disabilities) can access and afford internet services and that the service is fast and reliable. This could require substantial new investments. In addition, governance arrangements may need to be reformed to provide stronger oversight by state and potentially local government actors. These policy and governance reforms also address broader shortcomings of digital connectivity, which have established the case for breaking away from the prevalent model.

To identify policy priorities, we surveyed 26 international digital connectivity experts and asked them to rank a variety of policy instruments to facilitate better digital connectivity as well as evaluate the appropriateness of five governance and institutional reforms for different country contexts. Table 14 and Figure 4 summarise the results.

The top policy priority identified, selected as No. 1 by more than 60% of the experts surveyed, was to incorporate digital connectivity requirements as part of urban planning and building regulations. Such requirements would compel property developers to ensure access to digital infrastructure for all development projects, as is already common practice for transport infrastructure. This is the case in the UK, where building regulations since 2010 have required all new developments to be equipped with at least 30 Mbps ready in-building physical infrastructure. The Mayor of London's 2021 London Plan recommends that future development proposals should ensure affordable 1 Gbps-capable connections to all end-users.[167]
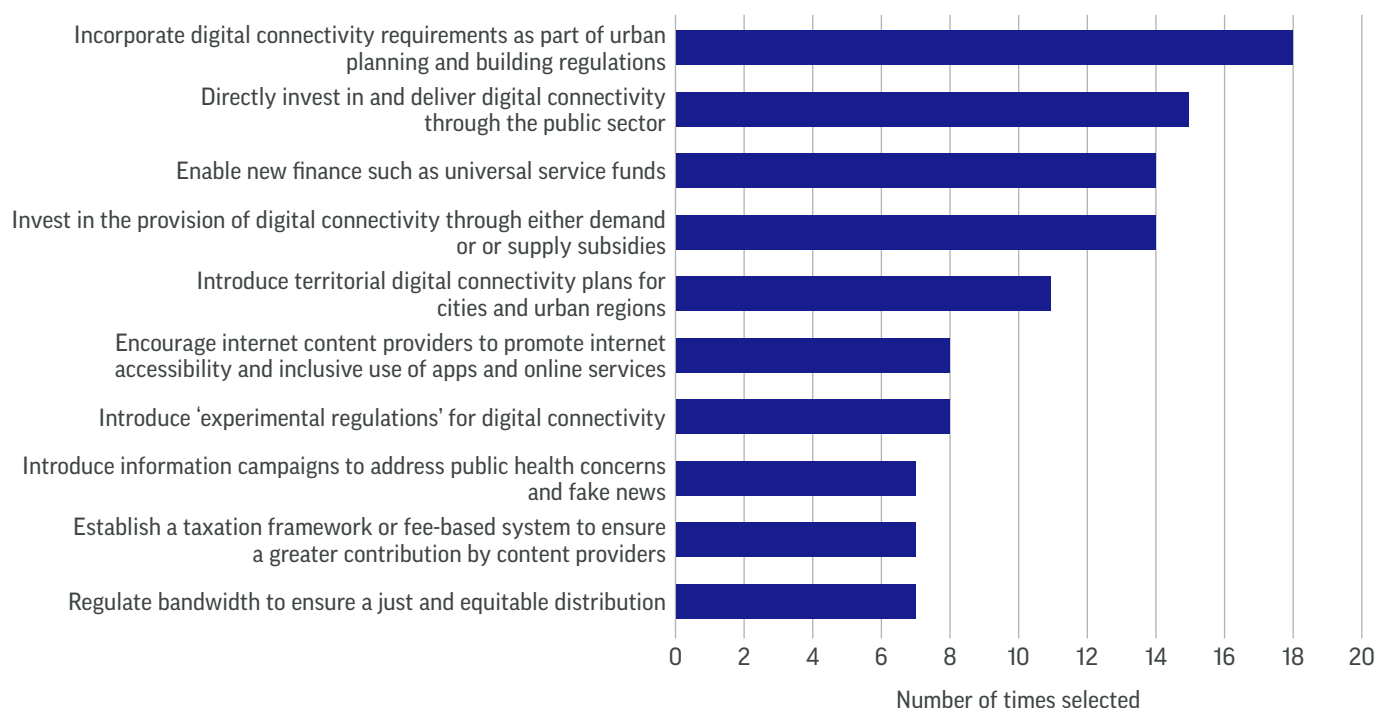
Economic instruments related to finance and investment also featured prominently, with more than 50% of experts identifying "directly invest in and deliver digital connectivity through the public sector", "enable new finance such as universal service funds", and "invest in the provision of digital connectivity through either demand or supply subsidies" as top priorities. This underlines the importance of diversifying existing funding models used in the provision of digital infrastructure, and the need for enhanced public investment if digital connectivity is to enable better urban development.

As for the governance and institutional reforms, the reform rated most appropriate across contexts was to introduce or extend the remit of municipal multi-utility companies to fully incorporate telecommunications infrastructure. This again suggests the need for an enhanced and direct public sector role in the provision of digital connectivity.

Table 14. Priority policy instruments to facilitate digital connectivity

	REGULATORY INSTRUMENTS		PRIORITY RANK
1	Incorporate digital connectivity requirements as part of urban planning and building regulation	**Amend urban planning and building regulation** to enable digital connectivity via digital connectivity requirements for new buildings and retrofitting old, fast-track the establishment of connection points.	1
2	Introduce territorial digital connectivity plans for cities and urban regions	**Introduce digital connectivity plans for cities and new planning activities** focusing on the comprehensive roll-out of fibre as well as 5G infrastructure, with particular attention to the intricate mosaic of transmission rather than traditional cables. This would enable a more efficient coordination of internet provision with other urban utilities to ensure appropriate infrastructure interfaces and reduce cost of installation and maintenance.	5
3	Introduce "experimental regulations" for digital connectivity	**Introduce new "experimental regulations" for digital connectivity** to test new business and governance models and improve on the speed and efficiency of traditional regulatory models.	6
4	Regulate bandwidth to ensure a just and equitable distribution	**Regulate bandwidth to ensure a just and equitable distribution** across internet users.	8=
5	Regulate the energy and carbon efficiency of data centres	**Introduce new and ambitious energy and carbon efficiency standards** for existing and new data centres.	12=
	Economic instruments		
6	Directly invest in and deliver digital connectivity through the public sector	**Direct investment and delivery of digital connectivity** (treated as a basic utility service) where the market fails (e.g. in relation to poorer communities and households). This could be in the form of a public utility company or through public private partnerships.	2
7	Enable new finance such as universal service funds	**Create new funding models and grants for internet service providers**, (e.g. through the introduction of universal service funds).	3=
8	Invest in the provision of digital connectivity through either demand or supply subsidies	**Provide subsidies for the provision of digital connectivity** where the market fails through either demand subsidies (e.g. vouchers for underserved or low-income communities), or through supply subsidies (e.g. providing grants to service providers to expand provision to underserved or remote areas).	3=
9	Establish a taxation framework or fee-based system for a greater contribution by content providers	**Establish a taxation framework or fee-based system** to have content providers and producers pay a more significant and fair share for digital infrastructures and connectivity (this may also be increasingly addressed by court cases). Avoid taxation that disincentivises digital connectivity or adds to its costs.	8=
10	Incentivise the use of AI and smart technologies to increase network efficiency	Incentivise use of **AI and smart technologies to increase efficienc**y in network provision and avoid over-provision of internet resources.	11
11	Introduce carbon pricing to digital connectivity and services	Extend or introduce **carbon pricing to all services and infrastructures** facilitating digital connectivity.	15
	Information-based instruments		
12	Encourage internet content providers to promote internet accessibility and inclusive use of apps and online services	Encourage internet content providers to take responsibility for **promoting accessible and inclusive content and ensuring equitable** access to digital society (e.g. through encouraging the provision of audio or visual aids for those with sensory impairments).	7
13	Introduce information campaigns to address public health concerns and fake news.	**Introduce information campaigns** to address public health concerns and fake news as a basic government service.	8=
14	Raise awareness of the impact of digital footprints	**Raise awareness of the impact of digital footprints** and promote careful and restrained use of the internet.	12=
15	Introduce emissions targets for internet service providers and data centres	**Introduce zero carbon emissions targets and standards** to ensure the use of sustainable materials by a specific date.	12=
	Governance and institutional reform		
16	Introduce or extend the remit of **municipal multi-utility companies** to fully incorporate telecommunications infrastructure		1
17	Significantly increase the **political, administrative and fiscal powers of regional and city governments** to oversee digital connectivity remits more independently		2
18	Significantly increase the **remit of public sector actors** and governments		3
19	Introduce or **extend the remit of metropolitan transport authorities** to oversee infrastructure roll-out, licencing and/or regulation of critical components of digital connectivity		4
20	**Introduce new intermediaries** to be positioned between content providers and infrastructure		5

Figure 4. Priorities for facilitating better urban development

	Number of times selected
Incorporate digital connectivity requirements as part of urban planning and building regulations	18
Directly invest in and deliver digital connectivity through the public sector	15
Enable new finance such as universal service funds	14
Invest in the provision of digital connectivity through either demand or or supply subsidies	14
Introduce territorial digital connectivity plans for cities and urban regions	11
Encourage internet content providers to promote internet accessibility and inclusive use of apps and online services	8
Introduce 'experimental regulations' for digital connectivity	8
Introduce information campaigns to address public health concerns and fake news	7
Establish a taxation framework or fee-based system to ensure a greater contribution by content providers	7
Regulate bandwidth to ensure a just and equitable distribution	7

URBAN FREIGHT AND LOGISTICS

Urban freight transport has been growing at an exponential rate across the world, with demand for last-mile deliveries expected to grow by 78% over the next decade.[168] Shifts towards remote working, e-commerce and digitalisation have driven a growing demand for home deliveries, which has led to a rapid decentralisation of final delivery destinations within cities and is contributing significantly to the overall distance travelled by urban freight vehicles. With the space constraints brought on by more compact urban centres, city authorities are under increasing pressure to manage goods distribution while limiting congestion, ensuring road safety and meeting increasingly urgent decarbonisation and air quality goals. At the same time, it is important to recognise that for less well-connected urban communities with limited access to goods, home deliveries may in fact be both more sustainable and more equitable that individual (car-based) trips.

E-commerce sales ratios nearly tripled globally between 2014 and 2019.[169] COVID-19 further accelerated this process, resulting in a shift from brick-and-mortar retail to e-commerce, which is expected to soon make up 20% of total retail sales globally.[170] By some estimates, these new consumption patterns are likely to lead to a 36% increase in delivery vehicles in inner cities between now and 2030.[171]

The environmental consequences of the rapid proliferation of goods movement are considerable: Freight emissions already make up more than 40% of total transport emissions, and freight demand is expected to double over the next three decades.[172] Without effective intervention, urban last-mile delivery emissions and traffic congestion are on track to increase by over 30% in the top 100 cities globally.[173]

In cities, the flexibility needed for "last mile" deliveries also means that trucks or vans remain the dominant transport mode to move goods through complex urban street grids, despite their significant environmental impact and their impact on road safety and congestion.[174] Most of these trips are completed by smaller delivery vehicles to get around regulations restricting goods vehicles above 3.5 tonnes in weight. In the UK, there has been a 74% increase in vans between 1996 and 2018, representing 15% of all motor vehicle traffic.[175] But the impact of freight is not limited to urban roads – increasing demand for warehouses and distribution centres creates tension with other land uses. As a result, such facilities are frequently located on cheaper land across the urban periphery, which can contribute to "logistics sprawl" and an associated increase in carbon emissions.[176]

Traditionally, transport policy has paid a lot more attention to the movement of people than the movement of goods, largely because freight is mainly a private business and is therefore not subject to the same public service obligations.[177] Yet the impacts of urban freight on carbon emissions, local air and noise pollution, congestion, road safety and urban streets create a multi-faceted policy challenge that urgently needs to be integrated in wider urban transport and land use planning. There are several major barriers to this integration. The urban freight market is highly fragmented, with limited incentives for private operators to share data in a competitive marketplace. This also prevents other forms of cooperation that could improve system-wide efficiency and sustainability. Public bodies generally have very limited oversight about the total number of delivery vehicles operating on city streets, as well as their cargo, their routes and their emissions levels. This is the case in cities around the world, but the high level of informality in emerging economy contexts further complicates the issue. This data scarcity is compounded by a lack of expertise around urban freight in local governments, with very few cities having dedicated in-house expertise to manage freight or consider how it could be integrated into the urban fabric in a way that maximises benefits and minimises negative externalities.[178]

REVISITING THE POLICY AGENDA FOR URBAN FREIGHT

Despite the growing importance and impact of urban freight, it remains a nascent policy space, with very few cities having dedicated expertise to help them manage the impacts on sustainability and liveability, especially when compared with other aspects of transport and urban planning. In most countries, urban freight also only receives limited attention in national policy-making, leading to a fragmented regulatory environment both within and across countries, with the private sector remaining the dominant stakeholder shaping urban freight and logistics.

For urban areas, the last mile of goods delivery poses the greatest challenges for the environment and liveability. It is also the most expensive segment of the supply chain, representing 28–50% of total transport costs.[179] Promoting alternative and more sustainable freight solutions that are more suitable to dense urban environments should therefore be a critical aspect of urban transport planning. Parcels represent a particularly urgent and growing challenge in this context, with consumer demand for 'next-day' or 'same day' delivery services leading to a proliferation of extra trips in vehicles that are not loaded to capacity.[180] Although this growth in freight volumes is driven in large part by unsustainable consumption patterns, policies that target consumer demand can be more challenging for governments to implement than supply-side policies that reduce the impact of these choices.

While demand for near-instant goods deliveries is certain to continue increasing, what can change is the transport mode used to deliver these goods. Cargo (e-) bikes present a key opportunity in this context. Many food and restaurant delivery services already rely on bicycle couriers, and in many European countries, mail carriers travel by bicycle. Shipping services such as DHL have begun cargo bicycle services in different urban areas. Cargo bikes can pass through low-emission or no-emission zones and would not be subject to congestion pricing.[181] It takes one to three bikes to substitute for a courier/express parcel delivery van based on average load capacity.[182] This suggests that in addition to decarbonisation, a shift to cargo bikes may also be a useful way of boosting employment (although questions remain about labour protections and employment precarity in relation to the delivery services sector as a whole).[183]

However, for a cargo-bike based urban delivery model to work, cities need to facilitate the development of urban consolidation centres in strategic locations from which goods can then be distributed to the end consumer. Often this will require the city to make inner-city land available for these uses or to subsidise the development of new hubs that can act as neutral spaces for multiple private operators to engage in asset-sharing.[184]

Planning for freight is still often left out of spatial planning and development strategies, with the consequence that demand for freight significantly exceeds supply in some urban areas. Failure to think about impacts on land use means that logistics operators are pushed further from urban centres and further from their end-destinations, which increases mileage, emissions and congestion.[185] This so called "logistics sprawl" can easily occur in the absence of strategic policy guidelines and can be particularly pronounced in cities that do not have historical rail or water connections that facilitate goods access to the inner city.

As a result of a lack of planning, public sector interventions are often reactive and punitive, which can undermine trust between local government and private sector operators. There is clearly a need to integrate freight planning in land use planning – for example, by including requirements for space designated for goods handling, storage and off-street delivery in building code regulations.

As freight transport is a highly fragmented multi-stakeholder activity, the only successful way to foster a real change in attitude and behaviour is through the involvement of all actors and stakeholders in the development of consensus-based strategies. No single stakeholder is capable of finding the most successful solution to the multiple issues that affect freight mobility in cities. It is therefore paramount that governments step up to the challenge of facilitating better public/private collaboration and making use of new technologies that can improve urban freight operations.[186]

POLICY INSTRUMENTS TO MAKE URBAN FREIGHT MORE SUSTAINABLE

We conducted a survey of global experts in urban freight and logistics to identify policy priorities. Respondents were asked to select their top five priorities from a list of 25 policy instruments, ranking them twice: first for their ability to address the climate emergency, then for their ability to promote more compact urban development (a proxy for urban accessibility). Table 15 and Figure 5 summarise the results.

While some of the policy instruments clearly tend to be seen as more important for one or the other of these agendas, there are also important overlaps, or "win-win" policy instruments that are considered equally important when it comes to addressing the climate emergency and more compact urban development. "Integrate freight and logistics planning into transport and land use plans" was the most frequently selected instrument in relation to both the stated policy agendas, chosen by 58% of respondents as their top priority. This aligns with results from the expert interviews conducted ahead of the survey, which repeatedly highlighted the importance of better integration between urban freight, transport and land use planning, both at the national level and within individual cities.
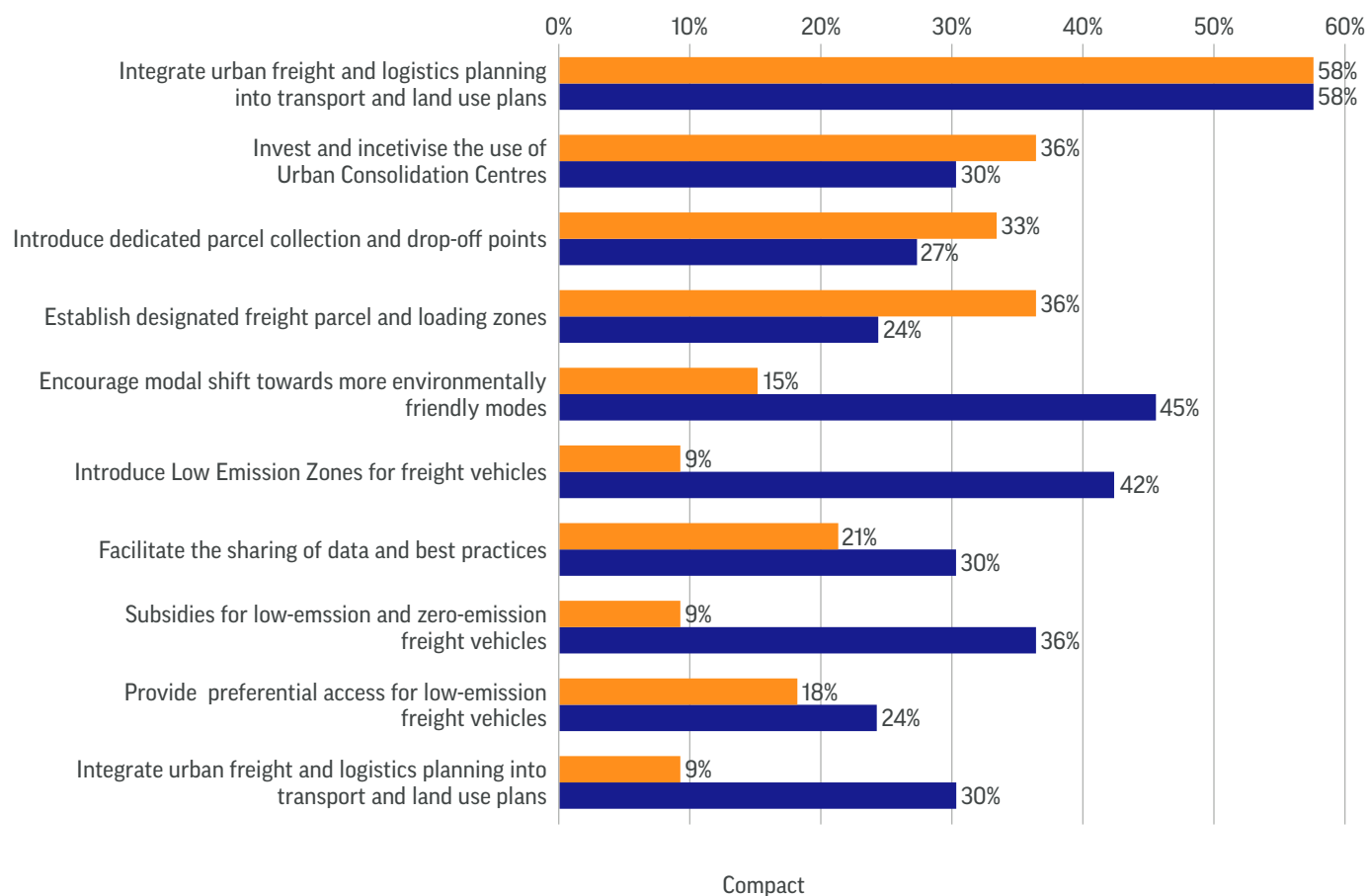
The other policy instruments that were seen as key priorities in relation to both climate and accessibility objectives included "investing in and incentivising the use of urban consolidation centres", introducing "dedicated parcel collection and drop-off points", "facilitating the sharing of data and best practices"," establishing designated freight parking and loading zones", and "providing preferential access for low-emission freight vehicles". It is interesting to see a real mix of policy levers emerging as priorities, including regulatory, economic and information-based policy instruments alongside wider governance reforms.

Table 15. Priority policy instruments to facilitate urban freight and logistics

Regulatory instruments		Priority Rank: Compact	Priority Rank: Climate	Win-win (top 10 for both)
1	Tighten emissions standards for freight vehicles	Increase the stringency of **vehicle emissions standards** for freight vehicles in addition to weight, noise and safety standards.	15=	5=	
2	Introduce Low Emission Zones for freight vehicles	Introduce access **restrictions for freight vehicles** (both large trucks and smaller vans, cars and motorcycles) that don't meet certain emission standards by establishing **Low Emission Zones**. Vehicles are either not allowed to enter this zone at all or have to pay a significant fee.	15=	3	
3	Introduce dedicated parcel collection and drop-off points	Designate **specific locations for pick-up and delivery of parcels** (e.g. automated locker systems, parcel shops, mini-depots). Ideally these should be located in strategic places that mean customers don't need to make major detours to access them.	4	8	███
4	Introduce vehicle size, weight or load factor restrictions for freight vehicles	Introduce **vehicle size and weight restrictions** (e.g. above 3.5 tonnes) for certain areas, either permanently or at certain times. This can also include load restrictions where vehicles need to meet a certain load factor to enter central areas.	22=	23=	
5	Introduce time access restrictions for freight vehicles	Introduce **delivery restrictions during certain times and for certain areas.** This may include peak hour or night-time bans on deliveries in areas where increased freight traffic may negatively impact congestion, noise or safety.	10=	20=	
6	Provide preferential access for low emission freight vehicles	**Allow access to bus lanes** or other restricted multi-use lanes or to certain restricted areas of the city for low or zero emission freight vehicles. This may include preferential parking spaces for such vehicles.	10=	9=	███
7	Mandate Delivery Service Plans for new developments	Require all new developments to have a **delivery service plan** in place that clearly identifies how goods deliveries will be handled.	6=	20=	
8	Update building code regulations to enable off-street deliveries	**Update building code regulations** to establish space requirements for goods handling, storage and off-street delivery including adequate loading docks for large buildings.	5	20=	
9	Establish designated freight parking and loading zones	**Reallocate kerb and road space** to create designated freight parking and loading zones that enable a more efficient loading and unloading of goods and improve traffic flow.	2=	9=	███
Economic instruments				
10	Introduce subsidies for low-emission and zero emission freight vehicles	Introduce **subsidies/tax rebates for electric freight vehicles** and **zero-carbon delivery services** (e.g. cargo bikes).	15=	4	
11	Introduce road pricing for freight vehicles	Charge **freight vehicles for the use of inter and intra-city roads through either fixed or dynamic road pricing** (e.g. tolls, congestion charging) to foster more efficient use of road space in cities and reduce peak period traffic volumes.	14=	13=	
12	Establish tradable emissions permits for freight services	Establish **tradable emission permits** and mobility credits for economic operators in the city, who can then "purchase" freight transport services with the credits they have been allocated.	22=	15=	
13	Invest in new electric infrastructure for road freight	Invest in **infrastructure to electrify inter-city freight transport** (e.g. e-highways with overhead cables currently being tested in Germany, Sweden, US).	15=	12	

#		Description			
14	Invest in freight clusters and logistics terminals	Invest in the development of **freight clusters** and other major infrastructure such as intermodal terminals that concentrate freight activities (distribution, storage, truck terminals) without contributing to "logistics sprawl" by identifying locations that are not too remote from the urban core and integrated with other land uses.	6=	18=	
15	Invest in and incentivise the use of Urban Consolidation Centres	Invest in **urban consolidation centres** and other cooperative logistics initiatives and joint delivery systems that enable the consolidation of cargo shipments in a single terminal from where they can be delivered by a neutral carrier.	2=	5=	■
16	Introduce Sustainable Freight Demonstration Cities	Fund the establishment of **Sustainable Freight Demonstration Cities** to encourage a more coordinated and comprehensive approach to urban freight and stimulate experimentation, which can generate new knowledge and be shared with other cities.	22=	15=	
17	Increase incentives for local goods production and circular economy initiatives	**Provide dedicated support** (tax incentives, subsidised rents) for local production (e.g. urban light manufacturing centres), as well as urban repair and recycling centres that can reduce consumption and demand for goods movement.	15=	13=	

Information-based instruments

#		Description			
18	Introduce Intelligent Transport Systems to facilitate dynamic routing	Introduce **Intelligent Transport Systems** (ITS) – for instance, via urban traffic management centres – that provide real time traffic updates and thereby enable dynamic routing **guidance to optimise freight movements**.	15=	18=	
19	Establish voluntary recognition and certification programmes	Introduce **voluntary recognition and certification programmes** that encourage certain behaviours or recognise certain performance (e.g. off-peak deliveries, driver training, vehicle maintenance).	15=	23=	
20	Establish eco-driving initiatives for truck drivers	Provide **training to change driver behaviour** and increase driver competencies by encouraging techniques that save fuel, reduce emissions and improve road safety.	25	23=	
21	Encourage modal shift towards more environmentally friendly modes	Establish **programmes to incentivise operators to shift** from road to rail and waterways or from trucks to cargo-bikes, especially for last mile deliveries.	12=	2	
22	Introduce Freight Quality Partnerships/ Freight Advisory Forums	Introduce **Freight Quality Partnerships (FQPs)** or **Freight Advisory Forums** that work to facilitate public-private discussions on freight and logistics issues by bringing together key stakeholders on a formal or informal basis with the aim of improving the efficiency of urban freight policy.	12=	11	
23	Facilitate the sharing of data and best practices	Improve **data collection and analysis** by working with the private sector to identify ways of making goods movement "visible" in statistics on traffic flows while also sharing best practices so that all stakeholders can learn from each other.	8=	5=	■

Governance and institutional reform

#		Description			
24	Integrate urban freight and logistics planning into transport and land use plans	Make freight a central component of integrated land use and transport plans, so conflict between freight activities and other land uses can be identified and mitigated from the start.	1	1	■
25	Fund the establishment of dedicated urban freight/city logistics teams	Establish d**edicated teams inside public authorities** with the mandate and resources to deal with urban freight issues. This includes dedicated positions such as City Logistics Managers that can act as intermediaries between freight and logistics stakeholders and the public authority.	8=	15=	

Figure 5. Top 10 Priorities for addressing the climate emergency and compact development

Priority	Orange	Navy
Integrate urban freight and logistics planning into transport and land use plans	58%	58%
Invest and incetivise the use of Urban Consolidation Centres	36%	30%
Introduce dedicated parcel collection and drop-off points	33%	27%
Establish designated freight parcel and loading zones	36%	24%
Encourage modal shift towards more environmentally friendly modes	15%	45%
Introduce Low Emission Zones for freight vehicles	9%	42%
Facilitate the sharing of data and best practices	21%	30%
Subsidies for low-emssion and zero-emission freight vehicles	9%	36%
Provide preferential access for low-emission freight vehicles	18%	24%
Integrate urban freight and logistics planning into transport and land use plans	9%	30%

Compact

9. Conclusion

Global urban development is at a crossroads. The culmination of a global pandemic in the shadows of an even more profound, longer term climate and social justice emergency is serving as a helpful reminder of the key role of territorial development. Whether it is the vulnerability to infectious disease, the carbon intensity of socio-economic development or a fairer organisation of societies, cities and their geographies will have to make a central contribution as part of the response to this triple crisis of the early 2020s. While there is a considerable risk of losing the achieved in terms of sustainable urban development, there is also a new and unexpected opening of a policy window for accelerated and lasting transformation.

This paper addressed one cross-cutting aspect of this change which is particularly relevant for cities: how to make territories more accessible and enable people to meet, trade and reach services, knowledge, goods and ideas. Based on this aspect, the paper advanced a political agenda for urban accessibility – the ability to reach opportunities, goods and services in cities – and identified related recovery measures and potential policy instruments to be considered by national policy makers for a post-2020 world.

The disruptions created by the COVID-19 crisis have also created important opportunities, and national governments need to seize them as part of recovery strategies and broader policy-making.

A pragmatic and implementation-oriented engagement that advances urban accessibility requires the equal consideration of three key policy fields: transport and telecommunications policy, land use and urban planning and social policy assisting the affordability of accessing opportunities. The ideal of compact, connected, clean and inclusive (3C+) cities has become a prominent interpretation of a good balance across these components.

A holistic agenda for advancing urban accessibility based on the 3C+ vision for urban development has yet to be integrated into national COVID-19 recovery strategies. Instead, as outlined in Part 1, the governments of the countries analysed are mainly responding to the short-term social and economic problems created by the pandemic. Some have made important investments that could help improve urban accessibility – or at least prevent harm, such as by supporting public transport systems facing major revenue shortfalls. However, many opportunities to make a real impact on urban accessibility have yet to be seized, and some investments and policy choices could actually set countries back in terms of decarbonisation and 3C+ urban development.

The paper also highlighted priorities for national governments to catalyse urban transformation in the near term: by (1) realigning national transport policies; (2) reforming housing and land use policies; (3) supporting the trend towards hyper-localisation and "15-minute cities"; (4) supporting and helping shape the growth of new urban mobility options; (5) encouraging cities to reallocate road space and engage in "tactical urbanism"; and (6) providing new finance for metropolitan-wide transport systems. In addition, it identified two policy "blind spots" that require prompt attention: digital connectivity, and urban freight and logistics.

The disruptions created by the COVID-19 crisis have also created important opportunities, and national governments need to seize them – as part of recovery strategies and as part of broader policy-making. By taking action in these eight areas, helping steer market forces in the right direction and supporting the transformative work being done by local governments, national leaders can make a significant contribution both to climate action and to urban accessibility.

ENDNOTES

1   Sims et al., 2014, "Transport," in *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*; IEA, 2020, "Tracking Transport 2020."

2   Detailed overviews of each case study country's policies can be found in Annex B. It is important to note that the analysis is based on publically available information as of March 2021, so it does not reflect new support packages and new policy reforms introduced by countries since then.

3   For more detailed definitions of urban accessibility, see: (A) Levinson, D. and D. King (2020). Transport Access Manual: A Guide for Measuring Connection between People and Places, Committee of the Transport Access Manual, University of Sydney. (B) Litman, T. (2017). Evaluating Accessibility for Transport Planning: Measuring People's Ability to Reach Desired Goods and Activities, Victoria Transport Policy Institute. (C) Gutman, J. and A. Tomer (2016). Developing a Common Narrative on Urban Accessibility: Overview. T. B. Institution.

    (D) Benjamin Baxter (2021), Achieving Balance: Urban Mobility Measures Which Support Sustainability and Accessibility, Eltis (www.eltis.org); at https://bit.ly/3irku2q. (E) Samikchhya Bhusal, Evelyn Blumenberg and Madeline Brozen (2021), Access to Opportunities Primer, UCLA Institute of Transportation Studies (www.lewis.ucla.edu); at https://escholarship.org/uc/item/98g9d5p4.

4   UN Habitat. (2020). "World Cities Report 2020: The Value of Sustainable Urbanization." from https://unhabitat.org/World%20Cities%20Report%202020.; CUT (2019). Climate Emergency, Urban Opportunity. London and Washington D.C., World Resources Institute (WRI) Ross Center for Sustainable Cities, C40 Cities Climate Leadership Group.; Habitat, U. (2013). Planning and design for sustainable urban mobility: Global report on human settlements 2013. United Nations Human Settlements Programme. New York, United Nations.; Rode, P. (2018). Governing Compact Cities: How to connect planning, design and transport. Cheltenham, Edward Elgar.

5   Ahlfeldt, G. and E. Pietrostefani (2017). Demystifying Compact Urban Growth: Evidence From 300 Studies From Across the World. London and Washington, Coalition for Urban Transitions and OECD

6   Levine, J. (2020), The Accessibility Shift: Conceptual Obstacles and How to Overcome (One of) Them, International Transport Forum Discussion Papers, No. 2020/23 OECD Publishing, Paris https://www.itf-oecd.org/sites/default/files/docs/accessibility-shift.pdf

7   See WHO data: https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health.

8   WHO, 2018. Global Status Report on Road Safety. Available at: https://www.who.int/publications/i/item/9789241565684.

9   TfL, 2014. Improving the health of Londoners: Transport Action Plan. Available at: http://content.
tfl.gov.uk/improving-the-health-of-londoners-transport-action-plan.pdf

10   Forth, T., 2019. "Birmingham isn't a big city at peak times": How poor public transport explains
the UK's productivity puzzle. City Monitor. Available at: https://citymonitor.ai/transport/
birmingham-isn-t-big-city-peak-times-how-poor-public-transport-explains-uk-s-productivity

11   Litman, T., 2018. Community Cohesion as a Transport Planning Objective. Available at:
https://www.vtpi.org/cohesion.pdf

12   UN Habitat (2020) World Cities Report 2020: The Value of Sustainable Urbanization.
https://unhabitat.org/wcr/

13   A large-scale survey conducted by Eurofound in July found that of the 24,123 respondents from
across the EU27, nearly half of those employed had worked from home at least some of the time
during the pandemic, and one third reported working exclusively from home. See: Eurofound,
2020. Living, working and COVID-19. Available at: https://www.eurofound.europa.eu/publications/
report/2020/living-working-and-covid-19

14   Li, C., and Lalani, F., (2020) The COVID-19 pandemic has changed education forever.
This is how. World Economic Forum. https://www.weforum.org/agenda/2020/04/
coronavirus-education-global-covid19-online-digital-learning/

15   In May, occupancy rates at US hotels were less than 15% for luxury hotels and around 40% for economy.
See: McKinsey & Company, 2020. Hospitality and COVID-19: How long until 'no vacancy' for US hotels?
Available at: https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/
our-insights/hospitality-and-covid-19-how-long-until-no-vacancy-for-us-hotels

16   Mastercard trend data for London shows that grocery and clothing purchases were down
by 60% in July compared with pre-pandemic levels, and restraint transactions were down by
80%. However, in smaller town centres in outer London zones such as Southall and East Ham,
transactions had increased from pre-pandemic levels, suggesting people were shopping and
spending in their neighbourhood areas as opposed to the city centre. See: Centre for London,
2020. The London Intelligence: August 2020. Available at: https://www.centreforlondon.org/
wp-content/uploads/2020/08/The-London-Intelligence_Aug-2020.pdf

17   Mass transit systems in the US face a collective annual budget shortfall of $10 billion,
even after the relief packages for transit agencies in the HEROES Act and CARES Act
were taken into account. See: Transit Center, 2020. Estimated financial shortfalls of
US transit agencies exceed HEROES Act funding. Abailable at: https://transitcenter.org/
estimated-financial-shortfalls-of-u-s-transit-agencies-exceed-heroes-act-funding/

18   D'Inca, J., Cresci, J. (2020) Here's how to make public transport safer during
COVID-19. World Economic Forum. https://www.weforum.org/agenda/2020/07/
masks-subway-disinfectant-how-to-make-commuters-feel-safe-after-covid-19/

19   A customer insight survey data conducted by Transport for London found that across the period from May to September 2020, respondents were more concerned about catching COVID-19 when on public transport than conducting any other activity such as attending places of work or education, or going to pubs and restaurants. See: Transport for London, 2020. Travel in London: Report 13. Available at: http://content.tfl.gov.uk/travel-in-london-report-13.pdf

20   Baiyu, G. (2020) How is the pandemic reshaping urban transport in China? *China Dialogue.* https://chinadialogue.net/en/transport/how-is-the-pandemic-reshaping-urban-transport-in-china/

21   Kamer, F. 2020. The Great Gotham Vroom Boom of 2020. *The Guardian.* https://www.nytimes.com/2020/08/12/style/car-buying-new-york-coronavirus.html

22   RAC, 2020. Perth traffic growing 12 times faster than forecast. https://rac.com.au/about-rac/media/media-releases/november-2020/perth-traffic-growing-12-times-faster-than-forecast

23   Harvey, H., 2020. Road congestion in outer London higher than before lockdown. The Guardian. https://www.theguardian.com/environment/2020/sep/15/road-congestion-levels-in-outer-london-higher-than-before-lockdown

24   In the third quarter of 2020, public transport demand in London was down by more than 60% compared with pre-pandemic levels. Private transport trips were down by only 10%. See: Transport for London, 2020. Travel in London: Report 13. Available at: http://content.tfl.gov.uk/travel-in-london-report-13.pdf.

     A consumer survey conducted by McKinsey in September found that car purchasing intent among respondents in the US, UK, Germany, Italy, Japan and China was still 14% below pre-pandemic levels. McKinsey and Company, 2020. How consumers' behaviour in car buying and mobility is changing amid COVID-19. Available at: https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/how-consumers-behavior-in-car-buying-and-mobility-changes-amid-covid-19.

25   Badger, E. 2021. "Covid Didn't Kill Cities. But Why Was That Prophecy so Alluring?" *The New York Times,* July 13. https://www.nytimes.com/2021/07/13/world/covid-didnt-kill-cities-but-why-was-that-prophecy-so-alluring.html.

26   Adlakha, D., and J.F. Sallis. 2020. "Activity-Friendly Neighbourhoods Can Benefit Non-Communicable and Infectious Diseases." *Cities & Health* Special Issue: COVID-19 (July). doi:10.1080/23748834.2020.1783479.

27   Carozzi, F., Provenzano, S., Roth, S., 2020. Urban Density and COVD-19. Centre for Economic Performance. https://cep.lse.ac.uk/pubs/download/dp1711.pdf

28   In the UK, residential real estate trends since the pandemic have shown increased buyer demand across the country as a whole. However, the largest increases on pre-pandemic levels have been in smaller towns and rurual areas, while large cities such as London saw much smaller increases in demand. See: Rightmove, 2020. Family homes in England's most in-demand areas. Available at: https://www.rightmove.co.uk/news/articles/property-news/england-most-in-demand-areas-buyers/

29 Romei, V. and Burn-Murdoch, J., 2020. From peak city to ghost town: the urban centres hit hardest by COVID-19. The Financial Times. https://www.ft.com/content/d5b45dba-14dc-443b-8a8c-e9e9bbc3fb9a

30 Florida, R., Rodriguez-Pose, A., Storper, M., 2020. *Cities in a Post-COVID World.* Papers in Evolutionary Economic Geography. https://ideas.repec.org/p/egu/wpaper/2041.html

31 Analysis by the European Commission suggests that around 25% of employees in the EU work in sectors that are "teleworkable". These sectors are characterised by higher-than-average employment conditions and very high wages. See: European Commission, 2020. The COVID confinement measures and EU labpur markets. https://ec.europa.eu/jrc/en/publication/covid-confinement-measures-and-eu-labour-markets

32 A survey of 2,500 workers in the US conducted in late May 2020 found that 42% were working from home. Of the latter, 58% had previously been commuting to offices in city centres. Due to these workers' higher-than-average incomes, the researchers estimated that remote workers acounted for more than two-thirds of GDP. This finding indicates the extreme economic impact that a more permanent shift of higher-income workers away from city centres could have on urban retail and service industries. See: Bloom, N., 2020. How working from home works out. Stanford Institute for Economic Policy Research. Available at: https://siepr.stanford.edu/research/publications/how-working-home-works-out

33 Scanlon, K., Blanc, F., Crankshaw, C., (2020) "Sharing a home under lockdown." LSE London Blogs. https://blogs.lse.ac.uk/lselondon/sharing-a-home-under-lockdown/

34 OECD, (2020) *Building back better: A sustainable, resilient recovery after COVID-19.* http://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/

35 Vivid Economics. 2021. "Greenness of Stimulus Index: An Assessment of COVID-19 Stimulus by G20 Countries and Other Major Economies in Relation to Climate Action and Biodiversity Goals (July 2021 Release)." Vivid Economics and Finance for Biodiversity Initiative. https://www.vivideconomics.com/casestudy/greenness-for-stimulus-index/.

36 Friedlingstein, P. et al., (2020) Global Carbon Budget 2020. Earth System Science Data. https://essd.copernicus.org/articles/12/3269/2020/

37 IEA 2021, Global Energy Review: CO2 Emissions in 2020, IEA, Paris https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

38 IEA, 2021. Global Energy Review: CO2 Emissions in 2020, IEA, Paris https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

39 IEA, 2021. Global Energy Review: CO2 Emissions in 2020. Understanding the Impacts of COVID-19 on global CO2 emissions. Accessible at: https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

40 Lenton, T.M., J. Rockström, O. Gaffney, S. Rahmstorf, K. Richardson, W. Steffen, and H.J. Schellnhuber. 2019. "Climate Tipping Points – Too Risky to Bet Against." *Nature* 575 (7784): 592–95. doi:10.1038/d41586-019-03595-0.

41 IEA, 2021. Global Energy Review: CO2 Emissions in 2020. Understanding the Impacts of COVID-19 on global CO2 emissions. Accessible at: https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

42 Sims, R., Schaeffer, R. et al., 2014. Transport. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Availabe at: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter8.pdf

43 Popovich, N., and Lu, D., 2019. The most detailed map of auto emissions in America. The New York Times. Available at: https://www.nytimes.com/interactive/2019/10/10/climate/driving-emissions-map.html

44 IEA, 2021. Global Energy Review: CO2 Emissions in 2020. Understanding the Impacts of COVID-19 on global CO2 emissions. https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

45 KPMG, 2021. The future of towns and cities post COVID-19. https://assets.kpmg/content/dam/kpmg/uk/pdf/2021/01/the-future-of-towns-and-cities-post-covid-19-how-will-covid-19-transform-england-s-town-and-city-centres.pdf

46 Ellen MacArthur Foundation, 2020. 10 Circular Economy Investment Opportunities for a Low-carbon and Prosperous Recovery. https://www.ellenmacarthurfoundation.org/assets/downloads/The-Built-Environment.pdf

47 OECD, 2020. Building back better: A sustainable, resilient recovery after COVID-19. Available at: http://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/

48 IEA, 2021. Global Energy Review: CO2 Emissions in 2020. Understanding the Impacts of COVID-19 on global CO2 emissions. Accessible at: https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020

49 Including a full recognition of land use and building regulation facilitating highly localised mixed use alongside accessible, walkable, human-scale streets.

50 Prioritising walking as the most inclusive, healthy and high-capacity transport mode over short distances, mainstreaming cycling as the most COVID safe and urban-agreeable transport mode over medium distances with enormous co-benefits for physical and mental health as well as quality of life.

51 Public transport funding models for comfortable, connected and COVID-safe public transport

52 Effective and efficient virtualisation has, for the first time, shown to significantly reduce physical travel intensities and related emissions. To further advance digital connectivity, policy will need to focus on the 47% of the worlds' population still not connected to the internet

53 LSE Cities, UCLG, Metropolis, 2020. *Towards a Concept and Framework for governing Complex Emergencies*. Available at: https://www.lse.ac.uk/Cities/publications/ Policy-Briefs-and-Analytics-Notes/Policy-Brief-02-Emergency-Governance-Initiative

54 Compact, connected, clean and inclusive (3C+) cities may be defined as cities with dense and proximate development patterns, connected by public transport networks and/or digital means ensuring to lessen the impact on the environment through less emissions and a more efficeny use of resources and energy, and guaranteeing that all reidents regardless of their age, gender, ethnicity, socio-economic background, or other characteristic, have a representative voice in governance, planning and budgeting.

55 See: OECD (2020) City Policy Responses at: https://www.oecd.org/coronavirus/policy-responses/ cities-policy-responses-fd1053ff/

56 Rode, P., Heeckt, C., Ahrend, R., Huerta Melchor, O., Robert, A., Badstuber, N., Hoolachan, A., and Kwami, C., (2017), Integrating national policies to deliver compact, connected cities: an overview of transport and housing. Coalition for Urban Transitions, London and Washington, DC. Available at: http://newclimateeconomy.net/content/cities-working-papers

57 See: OECD (2020) COVID-19 and the aviation industry: impact and policy responses. http://www.oecd.org/coronavirus/policy-responses/ covid-19-and-the-aviation-industry-impact-and-policy-responses-26d521c1.

58 See: OECD (2020) OECD Digital Economy Outlook 2020, OECD Publishing, Paris, https://doi. org/10.1787/bb167041-en.

59 For further information see: https://ec.europa.eu/transport/themes/mobilitystrategy_en

60 For further information see: https://platform2020redesign.org/countries/france/

61 See: Farrow, K, Tikoudis, I., and Oueslati, W. (2020), The Challenges of greening urban mobility in the post-pandemic era, OECD Environment Focus, https://oecd-environment-focus. blog/2020/07/24/the-challenges-of-greening-urban-mobility-in-the-post-pandemic-era/

62 See; Pilichowski, E. and Saint-Amans, P. (2020), COVID-19 and the Climate Crisis: combining green budgeting and tax policy tools for a better recovery. OECD Environment Focus, https:// oecd-environment-focus.blog/2020/10/29/covid-19-and-the-climate-crisis-combining-green- budgeting-and-tax-policy-tools-for-a-better-recovery/

63   Le Clercq, F. and de Vries, J.S. (2020), "Public Transport and the Compact City", Transportation Research Journal of the Transportation Research Board, N.1735(1) pp.3-9, DOI: 10.3141/1735-01 https://www.researchgate.net/publication/245559442_Public_Transport_and_the_Compact_City

64   See OECD (2017), The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264268609-en

65   See: OECD (020) Green budgeting and tax policy tools to support a green recovery. OECD Tackling Coronavirus (COVID-19): Contributing to a Global Effort, https://read.oecd-ilibrary.org/ view/?ref=137_137215-2knww1hckd&title=Green-budgeting-and-tax-policy-tools-to-support-a-green-recovery

66   See: Vivid Economics at: https://www.vivideconomics.com/wp-content/ uploads/2020/05/200506-Stimulus-Green-Index-summary-report.pdf

67   Forman, R.T.T. 2000. "Estimate of the Area Affected Ecologically by the Road System in the United States." *Conservation Biology* 14 (1): 31–35. doi:10.1046/j.1523-1739.2000.99299.x.

68   See: ITF (2020) COVID-19 Transport Brief. Re-spacing Our Cities for Resilience. https://www.itf-oecd.org/sites/default/files/respacing-cities-resilience-covid-19.pdf

69   See OECD (2020) Capacity for remote teleworking can affect lockdown costs differenty across places, at: https://www.oecd.org/coronavirus/policy-responses/capacity-for-remote-working-can-affect-lockdown-costs-differently-across-places-0e85740e/?_ ga=2.187368160.936377277.1622103962-2097936350.1618824159

70   See: OECD (2020), Germany: invest more in infrastructure, digital economy and energy transition for a strong and greener recovery from COVID-19 crisis; at: http://www.oecd.org/ germany/germany-invest-more-in-infrastructure-digital-economy-and-energy-transition-for-a-strong-and-greener-recovery-from-covid-19-crisis.htm

71   See: Serebrisky, T. et.al. (2020), Sustainable and digital infrastructure for the post-COVID-19 economic recovery of Latin America and the Caribbean: a roadmap to more jobs, integration and growth. IDB, https://publications.iadb.org/publications/english/document/Sustainable-and-Digital-Infrastructure-for-the-Post-COVID-19-Economic-Recovery-of-Latin-America-and-the-Caribbean-A-Roadmap-to-More-Jobs-Integration-and-Growth.pdf

72   See: OECD (2020) Cities policy responses, at http://www.oecd.org/coronavirus/policy-responses/ cities-policy-responses-fd1053ff/

73   See: Congressional Research Service at: https://sgp.fas.org/crs/misc/IF11327.pdf See:https://www.nar.realtor/smart_growth.nsf/Pages/ocg_winter2003_housing_ sector?OpenDocument#:~:text=The%20housing%20sector%20is%20one,of%20economic%20 output%20each%20year.

74 See INEGI: https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2019/StmaCntaNal/CSV2018.pdf

75 Ewing, R., S. Hamidi, J.B. Grace, and Y.D. Wei. 2016. "Does Urban Sprawl Hold down Upward Mobility?" *Landscape and Urban Planning* 148 (April): 80–88. doi:10.1016/j.landurbplan.2015.11.012.

76 See: OECD (2020), Cities policy responses, at: http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/

77 See: OECD (2020), Housing amid COVID-19: policy responses challenges, at: https://www.oecd.org/coronavirus/policy-responses/housing-amid-covid-19-policy-responses-and-challenges-cfdc08a8/

78 See: Moreno-Monroy, A., Gars, J., Matsumoto, T., Crook, J., Ahrend, R., Schumann, A. 2020. *Housing policies for sustainable and inclusive cities: How national governments can deliver affordable housing and compact urban development*. Coalition for Urban Transitions, London and Washington, DC. At: https://urbantransitions.global/wp-content/uploads/2020/02/Housing_Policies_for_Sustainable_and_Inclusive_Cities_web_FINAL.pdf

79 See: OECD (2020), Housing amid COVID-19: policy responses challenges, at: https://www.oecd.org/coronavirus/policy-responses/housing-amid-covid-19-policy-responses-and-challenges-cfdc08a8/

80 For an in-depth discussion see: Jaffe, Eric (2016), Where Sprawl Makes It Tougher to Rise Up the Social Ranks, Bloomberg City Lab at: www.bloomberg.com/news/articles/2016-01-27/where-urban-sprawl-makes-it-tougher-for-the-poor-to-rise-up-the-social-and-economic-ranks; and OECD (2015) OECD Urban Policy Reviews: Mexico 2015: Transforming Urban Policy and Housing Finance, OECD Publishing. http://dx.doi.org/10.1787/9789264227293-en

81 See: Moreno-Monroy, A., Gars, J., Matsumoto, T., Crook, J., Ahrend, R., Schumann, A. 2020. Housing policies for sustainable and inclusive cities: How national governments can deliver affordable housing and compact urban development. Coalition for Urban Transitions, London and Washington, DC. At: https://urbantransitions.global/wp-content/uploads/2020/02/Housing_Policies_for_Sustainable_and_Inclusive_Cities_web_FINAL.pdf

82 See: OECD (2017) The governance of land use in OECD countries: policy analysis and recommendations., OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264268609-en

83 See: World Green Building Council, 2017. Global Status Report. https://www.worldgbc.org/news-media/global-status-report-2017

84 See: IISD (2020) Green recovery stimulus for UK's housing sector, Sustainable recovery, at https://www.iisd.org/sustainable-recovery/news/green-recovery-stimulus-for-uks-housing-sector/

85 See: EEIG (2020), Energy efficiency's offer for a net zero compatible stimulus and recovery, at:
    https://www.theeeig.co.uk/media/1096/eeig_report_rebuilding_for_resilience_pages_01.pdf

86 Boydell, R (2020), Why zero-carbon homes must lead the green recovery from COVID-19,
    accessed at: https://theconversation.com/
    why-zero-carbon-homes-must-lead-the-green-recovery-from-covid-19-141149

87 See: Heeckt, C. and Huerta Melchor, O (2021), Compact, connected, clean and inclusive cities in
    Mexico: an agenda for national housing and transport policy reform, Coalition for Urban Transitions,
    The New Climate Economy. https://urbantransitions.global/en/publication/compact-connected-
    clean-and-inclusive-cities-in-mexico-an-agenda-for-national-housing-and-transport-policy-reform/

88 See: OECD (2020), Housing amid COVID-19: policy responses challenges, at:
    https://www.oecd.org/coronavirus/policy-responses/
    housing-amid-covid-19-policy-responses-and-challenges-cfdc08a8/

89 See: OECD (2020), Housing amid COVID-19: policy responses challenges, at: https://www.oecd.
    org/coronavirus/policy-responses/housing-amid-covid-19-policy-responses-and-challenges-
    cfdc08a8/ and OECD (2015), OECD Urban Policy Reviews: Mexico 2015: Transforming Urban
    Policy and Housing Finance, OECD Publishing. http://dx.doi.org/10.1787/9789264227293-en

90 UN Habitat. (2020). "World Cities Report 2020: The Value of Sustainable Urbanization." from
    https://unhabitat.org/World%20Cities%20Report%202020. ; OECD (2012). Compact city
    policies: a comparative assessment, OECD. ; EEA (2016). Urban Sprawl in Europe. ; OECD (2018).
    Rethinking Urban Sprawl.

91 German Federal Environment Agency, 2021. Settlement and traffic areas.
    https://www.umweltbundesamt.de/daten/flaeche-boden-land-oekosysteme/flaeche/
    siedlungs-verkehrsflaeche#anhaltender-flachenverbrauch-fur-siedlungs-und-verkehrszwecke-

92 See OECD (2020) COVID-19 and fiscal relations across levels of government; at:
    https://www.oecd.org/coronavirus/policy-responses/
    covid-19-and-fiscal-relations-across-levels-of-government-ab438b9f/

93 Information provided by the Polish Ministry of Fuinds and Regional Policy to the OECD.

94 Vivid Economics. 2021. "Greenness of Stimulus Index: An Assessment of COVID-19 Stimulus
    by G20 Countries and Other Major Economies in Relation to Climate Action and Biodiversity
    Goals (July 2021 Release)." Vivid Economics and Finance for Biodiversity Initiative. https://www.
    vivideconomics.com/casestudy/greenness-for-stimulus-index/.

95 Global Carbon Project, 2020. Carbon budget and trends 2020. www.globalcarbonproject.org/
    carbonbudget

96 International Energy Agency, 2021. *Global Energy Review: CO$_2$ Emissions in 2020. Understanding the Impacts of COVID-19 on global CO$_2$ emissions*. https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020.

97 Ibid.

98 Hodgson, C., 2021. "Global carbon emissions rebound to pre-lockdown levels" The Financial Times, 2 March 202: https://www.ft.com/content/600ad91f-79d4-451c-97c1-ab9a0daf4d3e

99 Agora Verkehrswende, 2020. Transport for under two degrees – the way forward. 10 key insights for the decarbonisation of the transport sector. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), World Economic Forum (WEF).

100 International Transport Forum (2021). ITF Transport Outlook 202 Executive Summary. OECD/ITF. https://www.itf-oecd.org/sites/default/files/transport-outlook-executive-summary-2021-english.pdf

101 Accelerating the electrification of the existing vehicle fleet is a policy priority. This will require coordination with energy policy to rapidly scale up wind and solar, which are predicted to be the leading energy carriers for transport.

102 Agora Verkehrswende, 2020. Transport for under two degrees – the way forward. 10 key insights for the decarbonisation of the transport sector. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), World Economic Forum (WEF).

103 Fransen et al. (2019). Enhancing NDCs: Opportunities in Transport. Working Paper. World Resources Institute/UNDP

104 The International Council on Clean Transportation (2020) Overview of global zero-emission vehicle mandate programs. https://theicct.org/sites/default/files/publications/Zero%20Emission%20Vehicle%20Mandate%20Briefing%20v2.pdf

105 World Resources Institute (2019) Enhancing NDCs: Opportunities in Transport. https://www.wri.org/publication/enhancing-ndcs-opportunities-transport

106 ICAT (2020), "Transport Pricing Methodology," ICAT Toolbox: Policy Assessment Guidelines, Initiative for Climate Action Transparency (https://climateactiontransparency.org); https://bit.ly/3q8iEXn.

107 Allen Greenberg and Jay Evans (2017), Comparing Greenhouse Gas Reductions and Legal Implementation Possibilities for Pay-to-Save Transportation Price-shifting Strategies and EPA's Clean Power Plan, Victoria Transport Policy In. (www.vtpi.org); at www.vtpi.org/G&E_GHG.pdf.

108 Bloomberg News, 2020. "France's SUV Tax Survives Challenge at Constitutional Court." 29 December 2020: https://news.bloombergtax.com/financial-accounting/frances-controversial-suv-tax-clears-constitutional-challenge?context=article-related

109 Wettengel, J, 2021. "Germany's carbon pricing system for transport and buildings" 10 August 2021: https://www.cleanenergywire.org/factsheets/germanys-planned-carbon-pricing-system-transport-and-buildings

110 Climate Watch, 2018. Canada's 2017 nationally determined contribution submission to the united nations framework convention on climate change. Available at: https://www.climatewatchdata.org/ndcs/country/CAN/full?document=first_ndc-EN&query=11&searchBy=goal

111 WRI (2019), Reducing Demand for Vehicle Trips in Cities – Learning Guide, The City Fix (https://thecityfixlearn.org); at https://thecityfixlearn.org/en/learning-guide/reducing-demand-vehicle-trips-cities.

112 ACEEE (2019), Sustainable Transportation Planning, American Council for an Energy Efficient Economy (www.aceee.org); at https://database.aceee.org/city/sustainable-transportation-planning.

113 Michelle Byars, Yishu Wei and Susan Handy (2017), State-Level Strategies for Reducing Vehicle Miles of Travel, University of California Institute of Transportation Studies (https://its.ucdavis.edu); at https://bit.ly/2LvA6nn.

114 Moreno-Monroy, A., Gars, J., Matsumoto, T., Crook, J., Ahrend, R., Schumann, A. 2020. *Housing policies for sustainable and inclusive cities: How national governments can deliver affordable housing and compact urban development*. Coalition for Urban Transitions, London and Washington, DC. Available at: https://urbantransitions.global/publications.

115 15-minute cities are also part of the C40 Mayors' Agenda for a Green and Just Recovery; see https://www.c40.org/other/agenda-for-a-green-and-just-recovery. The agenda includes the digitalisation of some services and a regulatory environment to ensure inclusive zoning, mixed-use development and flexible buildings and spaces.

116 Moreno, C. (2020) The Fifteen-Minute City: Rethinking urban life. OECD Forum. https://www.oecd-forum.org/posts/the-fifteen-minute-city-rethinking-urban-life

117 LSE Cities, 2021. Post-debate Film: Localising Transport. Urban Age Debates: Cities in the 2020s. https://www.youtube.com/watch?v=o7NZiFZSPWw

118 Eurofound (2020) Living, working and COVID-19 https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef20059en.pdf

119 Bloom, Nicholas (2020) How working from home works out. Stanford Institute for Policy Research. https://siepr.stanford.edu/research/publications/how-working-home-works-out

120 Institute of Directors (2020) Home-working here to stay, new IOD figures suggest. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef20059en.pdf

121 https://www.savills.co.uk/research_articles/229130/305234-0/
will-covid-19-breath-fresh-life-into-the-suburbs-of-manchester-

122 In the second quarter of 2020 the real estate advisory group JLL reported a 59% contraction in leased office space in London, 66% in New York and 77% in Tokyo as compared with the same period in 2019: https://www.ft.com/content/d5b45dba-14dc-443b-8a8c-e9e9bbc3fb9a

123 Read, S., 2021. " No full-time return to the office for over a million" BBC News: https://www.bbc.co.uk/news/business-56972207.

Anderson, M. & Krishner, T., 2021. "Adapt or else: Downtown businesses cope with new reality" Associated Press. https://apnews.com/article/europe-business-health-new-york-coronavirus-pandemic-29a0433d2e0a59a7155f501c4b973f0e

124 C40, 2020. How to build back better with a 15-minute city. https://www.c40knowledgehub.org/s/article/How-to-build-back-better-with-a-15-minute-city?language=en_US

125 Lam, T., 2021. Towards Gender-Inclusive and Sustainable Transport Systems. Feminist Green New Deal Policy Paper.Women's Budget Group: https://wbg.org.uk/wp-content/uploads/2021/06/Gender-inclusive-transport-systems-V3.pdf

126 Ibid.

127 Heeckt, C. and Huerta-Melchor, O. (2021). Compact, Connected, Clean and Inclusive Cities in Mexico: An agenda for national housing and transport policy reform. Coalition for Urban Transitions. https://coalitionforurbantransitions.com/en/publication/compact-connected-clean-and-inclusive-cities-in-mexico-an-agenda-for-national-housing-and-transport-policy-reform/

128 London Cycling Campaign (2019). Climate Safe Streets. https://s3.amazonaws.com/lcc_production_bucket/files/13596/original.pdf?1584617987

129 O'Sullivan, F., and Bliss, L. (2020) The 15-minute City – No Cars Required – Is Urban Planning's New Utopia. Bloomberg. https://www.bloomberg.com/news/features/2020-11-12/paris-s-15-minute-city-could-be-coming-to-an-urban-area-near-you

130 C40 (2020). How to build back better with a 15-minute city. https://www.c40knowledgehub.org/s/article/How-to-build-back-better-with-a-15-minute-city?language=en_US

131 Ibid.

132 Stefan Gössling (2020), Why Cities Need to Take Road Space from Cars – And How this Could be Done," Journal of Urban Design; at www.tandfonline.com/doi/full/10.1080/13574809.2020.1727318.

133 TA (2021), NYC 25x25: A Challenge to New York City's Next Leaders to Give Streets Back to People, Transportation Alternatives (www.transalt.org); at https://nyc25x25.org.

134 McKinsey (2020). The future of micromobility: Ridership and revenue after a crisis. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-micromobility-ridership-and-revenue-after-a-crisis

135 Agora Verkehrswende, 2020. Transport for under two degrees – the way forward. 10 key insights for the decarbonisation of the transport sector. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), World Economic Forum (WEF).

136 Sustrans, 2020. Our Position on Micromobility. https://www.sustrans.org.uk/our-blog/policy-positions/all/all/our-position-on-micromobility/

137 Ward, J.W., J.J. Michalek, C. Samaras, I.L. Azevedo, A. Henao, C. Rames, and T. Wenzel. 2021. "The Impact of Uber and Lyft on Vehicle Ownership, Fuel Economy, and Transit across U.S. Cities." IScience 24 (1): 101933. doi:10.1016/j.isci.2020.101933.

138 Schaller, B. 2018. "The New Automobility: Lyft, Uber and the Future of American Cities." Brooklyn, NY: Schaller Consulting. https://trid.trb.org/view/1527868.

139 https://www.itf-oecd.org/sites/default/files/docs/policy-priorities-decarbonising-urban-passenger-transport_0.pdf

140 Shaheen, S. et al., 2019. Shared Mobility Policy Playbook.

141 Sustrans, 2020. Our Position on Micromobility. https://www.sustrans.org.uk/our-blog/policy-positions/all/all/our-position-on-micromobility/

142 https://cities-today.com/how-los-angeles-took-control-of-its-mobility-data/

143 See the European Cyclists' Federation COVID-1019 Cycling Measures Tracker: https://ecf.com/dashboard.

144 C40, 2020. Prioritising cyclists and pedestrians for a safer, stronger recovery. C40 Implementation Guides, May 2020: https://www.c40knowledgehub.org/s/article/Prioritising-cyclists-and-pedestrians-for-a-safer-stronger-recovery?language=en_US

145 Arup, 2020. Tactical Urbanism: Making it happen. Available at: https://www.arup.com/perspectives/publications/research/section/tactical-urbanism

146 Walker, P., 2020. Despite a loud opposing minority, low-traffic neighbourhoods are increasingly popular. The Guardian. Available at: https://www.theguardian.com/environment/bike-blog/2020/oct/22/despite-a-loud-opposing-minority-low-traffic-neighbourhoods-are-increasingly-popular

147 Laverty, A., Aldred, R., Goodman, A., 2020. The impact of introducing low traffic neighbourhoods on road traffic injuries. Available at: https://osf.io/preprints/socarxiv/46p3w/

148 New York City Department of Transportation, 2013. The economic benefits of sustainable streets. Available at: http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf

149 Sharman, L., 2020. "Government announces £250m emergency active travel fund." https://www.localgov.co.uk/Government-announces-250m-emergency-active-travel-fund/50445

150 UK Department for Transport, 2020. Summary of the consultation proposals on a review of The Highway Code. https://www.gov.uk/government/consultations/review-of-the-highway-code-to-improve-road-safety-for-cyclists-pedestrians-and-horse-riders/summary-of-the-consultation-proposals-on-a-review-of-the-highway-code

151 Interreg Europe, 2020. "COVID 19: Starting a traffic revolution in Brussels." Policy Learning Platform: https://www.interregeurope.eu/policylearning/news/8638/covid-19-starting-a-traffic-revolution-in-brussels/

152 Jürgen Gies, Martina Hertel and Susan Tully (2021), Parking Standards as a Steering Instrument in Urban and Mobility: Planning How to Make Parking Standards More Sustainable, Sustainable Urban Mobility Plans (https://park4sump.eu); at https://bit.ly/36EJUF1.

153 Robert Pressl and Tom Rye (2020), Good Reasons and Principles for Parking Management, Sustainable Urban Mobility Plans (https://park4sump.eu); at https://bit.ly/3pNTw84.

154 IEA, 2020. Changes in transport behaviour during the Covid-19 crisis. Available at: https://www.iea.org/articles/changes-in-transport-behaviour-during-the-covid-19-crisis

155 TfL, 2020. Finance Report and Revised Budget. Available at: http://content.tfl.gov.uk/board-20200729-item09-finance-report-revised-budget.pdf

156 Rode, P., Heeckt, C., da Cruz, N.F. 2019. National Transport Policy and Cities: Key policy interventions to drive compact and connected urban growth. Coalition for Urban Transitions. London and Washington, DC. Available at: http://newclimateeconomy.net/content/citiesworking-papers.

157 Public Wifi in cities as one exception.

158 See UN Resolution A/HRC/32/L.20, adopted in 2016: https://www.un.org/ga/search/viewm_doc.asp?symbol=A/HRC/32/L.20.

159 The lack of planning and inadequate market structures for digital connectivity can be major barriers.

160 Broadband Commission (2019) Connecting Africa Through Broadband. https://www.
broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

161 High-speed internet access requires fibre connections directly connecting with end devices,
enabling WiFi or combinations of 3G, 4G and 5G mobility connectivity. Getting fibre
infrastructure into cities and ensuring full coverage remains a challenge. Additional challenges
of high connection costs exist for urban peripheries and rural areas.

162 Belkhir, L. and A. Elmeligi (2018). "Assessing ICT global emissions footprint: Trends to 2040 &
recommendations." Journal of Cleaner Production 177: 448-463. and Ferreboeuf, H. (2019). Lean
ICT: Toward digital sobriety.

163 Sustainable Development Goal No 9.c: 'significantly increase access to ICT and strive to provide
universal and affordable access to the Internet in least developed countries by 2020'

164 China has partnered with private organisations to come up with a "solidarity plan" and Egypt offers
free SIM cards to students and covers the cost of providing a 20% increase in subscribers' monthly
downloads. Thailand's public assistance scheme gives mobile users 10 free gigabytes of data.

165 Harrop, M (2020) How COVID-19 can accelerate the evolution of digital
connectivity. https://www.arcadis.com/en/global/arcadis-blog/mark-harrop/
how-covid-19-can-accelerate-the-evolution-of-digital-connectivity/

166 Chiou, L., and C. Tucker. 2020. "Social Distancing, Internet Access and Inequality." Working
Paper 26982. Working Paper Series. Cambridge, MA, US: National Bureau of Economic
Research. doi:10.3386/w26982.

Garrote Sanchez, D., N. Gomez Parra, C. Ozden, B. Rijkers, M. Viollaz, and H. Winkler. 2020.
"Who on Earth Can Work from Home?" Policy Research Working Paper No. 9347. Washington,
DC: World Bank. doi:10.1596/1813-9450-9347.

167 The Building Regulations (2010) https://www.legislation.gov.uk/uksi/2010/2214/contents/made

Mayor of London (2021) The London Plan. https://www.london.gov.uk/sites/default/files/the_
london_plan_2021.pdf

168 World Economic Forum (2020) The Future of the Last-Mile Ecosystem.
https://www.weforum.org/reports/the-future-of-the-last-mile-ecosystem

169 Ibid.

170 UNCTAD, 2021. Estimates of global e-commerce 2019 and preliminary assessment of COVID-
19 impact on online retail 2020. UNCTAD Technical Note 18. https://unctad.org/system/files/
official-document/tn_unctad_ict4d18_en.pdf

171 World Economic Forum (2020) The Future of the Last-Mile Ecosystem.
https://www.weforum.org/reports/the-future-of-the-last-mile-ecosystem

172 International Transport Forum, 2021. ITF Global Transport Outlook 2021.
https://www.itf-oecd.org/itf-transport-outlook-2021

173 World Economic Forum (2020) The Future of the Last-Mile Ecosystem.
https://www.weforum.org/reports/the-future-of-the-last-mile-ecosystem

174 Larger vehicles are also more dangerous, as the driver has less visibility and accidents tend
to cause more severe injuries. Also, pressure for immediate deliveries puts a lot of pressure
on drivers, who are often overworked, sleep-deprived and rushing to meet delivery deadlines
– risking more accidents (the business model itself leads to higher risks): https://www.itdp.
org/2019/09/13/urban-freight-will-keep-growing-but-it-doesnt-have-to-look-like-this/

175 Urban Transport Group (2018) White Van Cities
https://www.urbantransportgroup.org/media-centre/press-releases/
growth-van-traffic-creating-%E2%80%98considerable-challenges%E2%80%99-uk-cities-finds

176 Dablanc, L. and Rakotonarivo, D. (2010) The impacts of logistics sprawl: How does the location
of parcel transport terminals affect the energy efficiency of goods' movements in Paris and
what can we do about it?,

Procedia - Social and Behavioral Sciences, Volume 2, Issue 3.

177 International Transport Forum, 2021. ITF Global Transport Outlook 2021. https://www.itf-oecd.
org/itf-transport-outlook-2021

178 In Seattle, there is not a single city official tasked with urban freight and logistics policy. Even
in places like London, where there used to be a large dedicated team at TfL working on these
issues, this has now been reduced significantly.

179 McCrea, B. (2016). From DC to Final Destination: Last Mile Dilemma. Supply Chain
Management Review. MMH Editorial. https://www.logisticsmgmt.com/article/
from_dc_to_final_destination_last_mile_dilemma

180 Abboud, L. and Hodgson, C., 2019. "Climate costs mount as retailers compete on fast delivery"
The Financial Times, 23 December 2019: https://www.ft.com/
content/2f7203dc-1b63-11ea-97df-cc63de1d73f4

181 Institute for Transport and Development Policy, 2019. Urban freight will keep
growing, but it doesn't have to look like this. https://www.itdp.org/2019/09/13/
urban-freight-will-keep-growing-but-it-doesnt-have-to-look-like-this/

182 Cairns, S. and Sloman, L. (2019) Potential for e-cargo bikes to reduce congestion and pollution from vans in cities. https://www.bicycleassociation.org.uk/wp-content/uploads/2019/07/Potential-for-e-cargo-bikes-to-reduce-congestion-and-pollution-from-vans-FINAL.pdf

183 Wall, T. (2020) Actors, pilots, oil workers... thousands from COVID-blighted jobs join parcel courier army. The Guardian. https://www.theguardian.com/business/2020/nov/29/actors-pilots-oil-workers-thousands-from-covid-blighted-jobs-join-parcel-courier-army?CMP=Share_AndroidApp_Other

184 Allen, J., Browne, M., Woodburn, A., & Leonardi, J. (2012) The Role of Urban Consolidation Centres in Sustainable Freight Transport, *Transport Reviews*, 32:4, 473-490, DOI: 10.1080/01441647.2012.688074

185 National Infrastructure Commission (2018) Future of Freight: Interim Report. https://www.nic.org.uk/wp-content/uploads/Future-of-Freight-Interim-Report-2.pdf

186 Civitas, 2020. Smart choices for cities: Making urban logistics more sustainable. https://civitas.eu/sites/default/files/civ_pol-an5_urban_web.pdf

187 Cartwright. 2015. 'Better Growth, Better Cities: Rethinking and Redirecting Urbanisation in Africa'. Working Paper. London and Washington, DC: New Climate Economy, Global Commission on the Economy and Climate. Available at: http://newclimateeconomy.report/2015/wp-content/uploads/sites/3/2015/09/NCE2015_APP.pdf.

188 Cartwright. 2015. 'Better Growth, Better Cities: Rethinking and Redirecting Urbanisation in Africa'. Working Paper. London and Washington, DC: New Climate Economy, Global Commission on the Economy and Climate. Available at: http://newclimateeconomy.report/2015/wp-content/uploads/sites/3/2015/09/NCE2015_APP.pdf.

189 Cartwright. 2015. 'Better Growth, Better Cities: Rethinking and Redirecting Urbanisation in Africa'. Working Paper. London and Washington, DC: New Climate Economy, Global Commission on the Economy and Climate. Available at: http://newclimateeconomy.report/2015/wp-content/uploads/sites/3/2015/09/NCE2015_APP.pdf.

190 Kareem, B., Lwasa, S., Tugume, D., Mukwaya, P., Walubwa, J., Owuor, S., Kasaija, P., Seviiri, H., Nsangi, G., and Byarugaba, D. 2020. 'Pathways for Resilience to Climate Change in African Studies', *Environmental Research Letters* 15. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab7951.

191 Kareem, B., Lwasa, S., Tugume, D., Mukwaya, P., Walubwa, J., Owuor, S., Kasaija, P., Seviiri, H., Nsangi, G., and Byarugaba, D. 2020. 'Pathways for Resilience to Climate Change in African Studies', *Environmental Research Letters* 15. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab7951.

192 Cartwright. 2015. 'Better Growth, Better Cities: Rethinking and Redirecting Urbanisation in Africa'. Working Paper. London and Washington, DC: New Climate Economy, Global Commission on the Economy and Climate. Available at: http://newclimateeconomy.report/2015/wp-content/uploads/sites/3/2015/09/NCE2015_APP.pdf.

193 Zermoglio, F., Steynor, A. and Jack, C. 2015. 'Climate Change and Health Risks in Senegal'. Washington, DC: United States Agency for International Development (USAID).

194 Zermoglio, F., Steynor, A. and Jack, C. 2015. 'Climate Change and Health Risks in Senegal'. Washington, DC: United States Agency for International Development (USAID).

195 C40 Cities Finance Facility, 2020, 'Dakar—Improving Resilience to Climate Induced Flooding'. C40 Cities Climate Leadership Group and C40 Knowledge Hub. Available at: c40cff.org.

196 Kareem, B., Lwasa, S., Tugume, D., Mukwaya, P., Walubwa, J., Owuor, S., Kasaija, P., Seviiri, H., Nsangi, G., and Byarugaba, D. 2020. 'Pathways for Resilience to Climate Change in African Studies', *Environmental Research Letters* 15. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab7951.

197 Kareem, B., Lwasa, S., Tugume, D., Mukwaya, P., Walubwa, J., Owuor, S., Kasaija, P., Seviiri, H., Nsangi, G., and Byarugaba, D. 2020. 'Pathways for Resilience to Climate Change in African Studies', *Environmental Research Letters* 15. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab7951.

198 Kareem, B., Lwasa, S., Tugume, D., Mukwaya, P., Walubwa, J., Owuor, S., Kasaija, P., Seviiri, H., Nsangi, G., and Byarugaba, D. 2020. 'Pathways for Resilience to Climate Change in African Studies', *Environmental Research Letters* 15. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab7951.

ABOUT THE COALITION FOR URBAN TRANSITIONS

The Coalition for Urban Transitions is the foremost initiative supporting national governments to secure economic prosperity and reduce the risk of climate change by transforming cities. The Coalition equips national governments with the evidence and policy options they need to foster more compact, connected, clean and resilient urban development. The Coalition's country programmes in China, Ghana, Mexico and Tanzania provide models for other countries on how to effectively develop national urban policies and infrastructure investment strategies.

A special initiative of the New Climate Economy (NCE), the Coalition for Urban Transitions is jointly managed by C40 Cities Climate Leadership Group and the World Resources Institute Ross Center for Sustainable Cities. A partnership of 35+ diverse stakeholders across five continents drives the Coalition, including leading urban-focused institutions and their practice leaders from major think-tanks, research institutions, city networks, international organisations, major investors, infrastructure providers, and strategic advisory companies.

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