



The Covid-19 Pandemic, Transport and Land Use in Britain:

Key strategic issues for policy makers

Sarah Kendall & Matthew Niblett

September 2021



INDEPENDENT
TRANSPORT
COMMISSION

Published by the Independent Transport Commission

The **Independent Transport Commission (ITC)** is one of Britain's leading research charities with a mission to explore all aspects of transport and land use policy. Through our independent research work and educational events we aim to improve and better inform public policy making. For more information on our current research and activities please see our website: www.theitc.org.uk

Independent Transport Commission
70 Cowcross Street
London
EC1M 6EJ

Email: contact@theitc.org.uk
www.theitc.org.uk

Registered Charity No. 1080134
September 2021 © Copyright Independent Transport Commission

Acknowledgments:

The ITC would like to record its gratitude to all our corporate members, a list of whom can be found on the main ITC website (www.theitc.org.uk). Their important support has made this research possible.

This report was authored by Sarah Kendall and Matthew Niblett, with assistance from Christine Hannigan and Leigh Stanford. We are grateful to all those who kindly responded to the ITC consultation on which this paper is based, especially James Angus, Elliot Shaw, Deborah Saunt and DSDHA colleagues, Elaine Seagriff, Sir Peter Hendy, Roger Madelin, Neil Micklethwaite, Simon Nielsen, David Banister, Peter Jones, and Matt Winfield.

September 2021

The Covid-19 Pandemic, Transport and Land Use in Britain

Sarah Kendall & Matthew Niblett

September 2021



The Covid-19 Pandemic, Transport and Land Use in Britain: Key strategic issues for policy makers

Table of Contents

Acknowledgments	2
Executive Summary	6
Report:	
1 Introduction	10
1.1 The Covid-19 Pandemic	10
1.2 ITC Consultation overview	10
1.3 Key aims of the Paper	11
1.4 Structure of the Paper	11
2 Travel Behaviour and Demand	12
2.1 Wider trends caused or accelerated by the Pandemic	12
2.2 Impact upon the movement of people	15
2.3 Impact upon the movement of goods	18
2.4 Scenarios for future travel behaviour and demand	19
3 Land Use and Planning	21
3.1 The impact of the pandemic on cities, towns and rural locations	21
3.2 The impact of hybrid working patterns on land use	21
3.3 Changes in residential needs	23
3.4 Implications for commercial, residential and urban planning	23



4	Transport Infrastructure	28
4.1	Impact upon fixed and other infrastructure	28
4.2	Changes in infrastructure needs	30
4.3	Funding challenges	34
5	Implications for Policy Makers	38
5.1	Key long-term policy challenges	38
5.2	Recommendations for strategic policy making	39
6	Conclusion	41
	List of Consultation Responses	42

Executive Summary

E1. The global pandemic caused by the SARS-CoV-2 virus has had the most disruptive impact on everyday life in Britain since the end of the Second World War. The measures necessary to control the virus have affected many areas of people's lives, and forced changes to how we live, work and travel. Although vaccines have helped to reduce the severity of Covid19 disease, uncertainties remain about the future trajectory of the virus and the extent to which behaviours have been permanently affected. To understand the implications for the future direction of transport and land use policy, the Independent Transport Commission (ITC) commissioned this paper in 2020 to review the situation and it provides a snapshot of conditions at the end of summer 2021. Note that this paper focuses on domestic travel in Great Britain only.

Travel Behaviour and Demand

- E2.** The impacts of the pandemic have been various and resulted in major shifts in behavioural patterns as well as accelerating pre-existing trends. These have included a significant increase in flexible and home working, which has been navigated successfully by most businesses. Most employees have developed a more positive view of remote and flexible working and this is likely to persist even after the pandemic recedes. In addition, there has been a substantial increase in online activity, both for purchases of goods and in the provision of services. Social distancing measures have increased awareness of the importance of outside and green spaces, and generated an aversion to crowded places; both of which are likely to leave a footprint on future behaviour.
- E3.** The pandemic has had a substantial impact upon travel demand and behaviour. Initially there was a rapid collapse in travel demand, but the recovery from this has varied significantly by mode. While car use has almost returned to pre-pandemic levels by Summer 2021, public transport usage has seen a slower recovery, with rail, London underground and bus usage recovering to about 60% of pre-pandemic levels by Summer 2021. Active travel has received a strong boost due to the recommendation to stay local during lockdowns, but cycling and walking are very seasonal and highly weather dependent. Goods traffic, on the other hand, has recovered strongly and road freight traffic now exceeds pre-pandemic levels by almost 20%, driven by the increase in online shopping. Rail freight has rebounded as construction and car sales reopened in Summer 2020, and demand for intermodal freight increased. The pandemic has also highlighted vulnerabilities in the provision of just-in-time logistics.



- E4.** Where the impacts of the pandemic have accelerated pre-existing trends, such as the trend towards online retail and more flexible working patterns, these are unlikely to be easily reversed. Commuting travel is likely, therefore, to remain depressed compared with pre-pandemic levels, although there are signs that leisure travel for holidays and visiting friends/relatives has increased, with long-distance rail travel and weekend journeys across all modes recovering faster. Increases in light goods vehicle traffic due to more online shopping are likely to be permanent, and policy makers should plan accordingly for accommodating these trends.

Land Use and Planning

- E5.** The pandemic has had a significant impact upon where and how we use work and home spaces. Many employers have committed to providing more flexible and hybrid working opportunities even after the pandemic has receded, although this is more feasible in knowledge industry employment sectors and less so in others such as construction, healthcare, lorry driving and hospitality where physical presence is required. This is likely to result in an acceleration in the use of shared workspaces in cities, as well as practices such as hot desking and virtual conferencing. Cities with high levels of the workforce in knowledge economy jobs, such as Edinburgh, Bristol and London, are likely to see the most significant changes. Urban planners may need to transform commercial office space into residential units to reflect changes in demand, while there is likely to be increased demand for offices with access to outside or green space.
- E6.** The pandemic has also adjusted how we use and value our homes and residential spaces. Increased home working has boosted the need for home office space and high-quality, reliable online connectivity. Homeowners say that they now give more weight to flexible home layouts and outside space. Residential location preferences have also changed, with an increase in demand for more spacious houses in rural and suburban settlements, although demand for city-centre accommodation was beginning to recover by Summer 2021. This all has implications for the future design of residential developments, which will also need to accommodate increasing demand for low-carbon electric mobility.
- E7.** In terms of urban planning, the pandemic has renewed interest in the idea of the 15-minute city, with its greater emphasis upon local facilities and mobility. Local authorities might well have to take a firmer approach on requiring developers to provide good-quality shared outside amenity spaces in their masterplanning. The design of homes will also need to accommodate increased demand for flexible layouts and outside space. The acceleration of e-commerce is also likely to require more local distribution hubs to be provided as well as more warehousing in strategic locations. Rural areas may need additional funding to cope with increased demand for housing provision and from domestic tourism, which has soared since pandemic restrictions were eased.

Transport Infrastructure

- E8.** The pandemic has delivered a shock to transport networks and to assumptions about infrastructure needs. Fixed infrastructure has a multi-decadal life so rapid adaptations are likely to be limited. However, the pandemic has provided an opportunity to 'build back better' and potentially accelerate the introduction of enhanced sustainability and low-carbon measures. At the national level, major public transport projects are likely to still be needed in view of meeting climate change targets. Meanwhile, changed patterns of demand may create new opportunities such as adjusting the timing of rail engineering works. At a regional level, a greater geographic spread of work-related travel, and a wider time spread of peak hour commuting, could help to reduce stress on overcrowded networks and improve resilience. Road networks are in danger of overcrowding due to the increase in freight traffic and the rapid rebound in car travel. The ITC's research work shows that road user charging should be considered urgently and can be made publicly acceptable if implemented intelligently.
- E9.** Transport and infrastructure operating costs are relatively fixed and have remained high even though patronage and revenue, especially on public transport, has reduced. Given the need to support public transport if the Government's zero carbon objectives are to be met, it is likely that the taxpayer will need to shoulder a higher share of these costs in the future. In addition, it is clear that appraisal methods will need to be updated to account for changes wrought by the pandemic. There is scope for a much greater alignment between transport policy and investment, and wider policy objectives such as meeting climate change and health targets. 'Polluter pays' approaches could become more important, although there is also a need for national funding to help some sectors, especially aviation and freight, to achieve sustainability milestones.

Implications for Policy Making

- E10.** The pandemic and the changes it has brought provide an opportunity for aligning transport and land use policy much more closely with wider Government objectives. These include the need for transport and new development to support economic recovery, to meet net zero carbon emission targets, and help address regional economic disparities. Public transport will play a crucial role in meeting these objectives, and Government messaging should be strong in encouraging a return of passenger transport demand and boosting confidence in the safety of buses and trains. Increased investment in transport infrastructure will also be essential to help our networks recover from the crisis, to kick start the economy through job creation and stimulus, and to improve sustainable travel. Transport operators will also need taxpayer assistance to help recover and prevent a vicious circle of falling services and demand.

**E11.**

Land use changes mean that urban planners and developers will need to rethink commercial and residential needs. 'Tactical urbanism' could be adopted to make better use of urban land in response to the blurring of boundaries between residential and commercial use. To attract people back into city centres there should be a greater emphasis upon green spaces and attractive meeting places. Finally, the pandemic has demonstrated that travel provides important benefits for mental and social well-being. Attention and appropriate funding support should be directed to maintaining the increase in active travel, and should ensure that the crisis does not result in greater social exclusion as a result of a loss of public transport services in poorer areas.

I. Introduction

I.1 The Covid-19 Pandemic

The global pandemic caused by the SARS-CoV-2 virus has had the most disruptive impact on transport in Britain since the Second World War. Since the arrival of the virus in the UK during January and February 2020 we have seen severe restrictions on travel caused by the need to control virus transmission. These measures have dramatically impacted both domestic and international travel. Although medical advances such as vaccines and treatments have enabled progress to be made in reducing the health impacts of the virus in Britain, it is still not clear at the time of writing (Summer 2021) for how long the effects of the virus, and the measures required to control it, will remain. The economic impacts of the pandemic will also be felt for many years.

What is clear, however, is that the pandemic has affected many aspects of our lives, and forced major changes to how we live, work and travel. The reshaping of travel demand and behaviour over the past eighteen months, and the consequences for policy making, are profound. While it is still too early to know how long-term these changes will be, or the extent to which travel has been permanently changed, evidence and trends are emerging that are providing a clearer view of the possible route maps ahead. The strategic implications of these are explored in this paper.

I.2 ITC Consultation overview

The Independent Transport Commission (ITC) is Britain's leading pan transport and land use research charity. Our remit is to explore longer-term, strategic policy issues, and our focus is therefore on the 'big picture' issues which underpin policy formation. To understand better the challenges arising for policy makers from the pandemic, the ITC has commissioned this work to explore the impacts and implications for transport and land use.

To help gather the best evidence on the impacts of the pandemic, the ITC conducted an industry-wide consultation during 2020 seeking viewpoints and data. This was based on a questionnaire to which respondents could provide a written submission or take part in an online interview. We were grateful for the wide range of responses received from industry-leading organisations, and a list of those who helpfully contributed is provided at the end of this paper. The ITC collected the main views and issues raised into a submission to the UK Parliament's Transport Select Committee inquiry. In this paper we will explore these issues raised in greater detail and provide recommendations.



1.3 Key aims of the Paper

This paper aims to explore some of the key impacts of the Covid-19 pandemic on transport and land use in Britain. It is important to note that, to keep the parameters of this study manageable, and due to our focus on UK policy making, the paper will focus on land-based domestic travel only, and not international travel. We also acknowledge the high level of uncertainty that remains about the future trajectory of the pandemic and its impact on behaviour. Given the short timeframe that has elapsed since the start of the pandemic, evidence is naturally patchy and data does not always exist to enable robust claims to be made. However, the report uses data and evidence where this has been made available, and focuses on how key policy objectives and commitments made by the Government can be achieved under the new paradigm.

The report uses the evidence and data made available to the ITC to review the impacts of the pandemic on transport demand and behaviour as well as on cities, land use and placemaking. We review the potential implications of these changes on infrastructure planning, urban design and policy making. It is anticipated that the findings will be of interest to all those with an interest in transport and land use policy.

Given the uncertainties that remain around these issues, this paper should be seen as a perspective based on the evidence available in Summer 2021. It is likely that the ITC will update this paper over the next 12-18 months, as and when further evidence becomes available and the future shape of recovery from the pandemic becomes apparent.

1.4 Structure of the Paper

The structure of the paper reflects the above objectives, and is built around four key sections:

- 1.** The impacts of the pandemic on land-based travel behaviour and demand;
- 2.** How the pandemic has impacted land use, cities and our use of place;
- 3.** The impacts and implications of the pandemic on transport infrastructure;
- 4.** The implications of the pandemic for policy makers and achieving current strategic policy objectives.

The paper concludes with some observations and suggestions for policy makers based on the preceding analysis.

2. Travel Behaviour and Demand

2.1 Wider trends caused or accelerated by the Pandemic

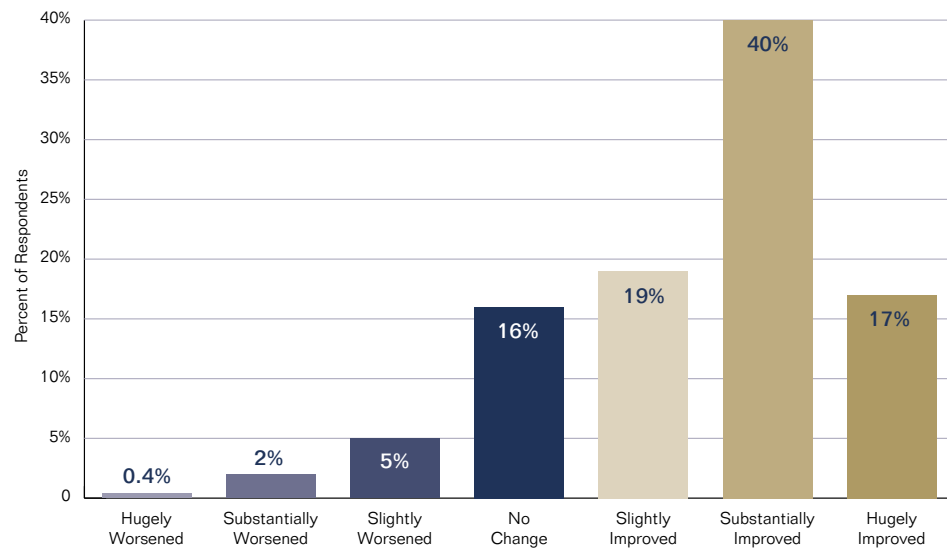
The impacts of the Covid-19 pandemic on life in Britain have been profound. Since the arrival of the virus, from March 2020 until Autumn 2021 there have been a number of phases designed to reduce the impact of the disease:

- From 23 March 2020 a stay-at-home order was introduced banning all non-essential travel and unnecessary contact with other households. As national cases fell accordingly, these restrictions were gradually lifted in June and July with the exception of local areas where cases had spiked.
- Following a rise in infections during September and October 2020, a tiered system of public health measures was imposed in England, as well as circuit-breaker lockdowns by the devolved governments.
- A surge in cases during December caused by a new variant of the virus resulted in a further national lockdown from early January 2021. Coupled with a widespread vaccination programme, these restrictions helped to reduce infections dramatically by Easter 2021. The public health measures were gradually eased over the course of late Spring 2021.
- In July 2021 the Government removed all remaining public health measures in spite of a surge of infections from the Delta virus variant. This shift marked a move in favour of a 'live with the virus' policy but whether this is sustainable will depend upon the scale of pressures on the NHS, public behaviour as well as how successful current vaccines are at reducing serious illness over the longer term.

The implementation of these strict measures to control the pandemic has resulted in major shifts in behavioural patterns. It is currently unknown how permanent these behavioural changes will be, although the longer such behaviours continue the less likely it is that they will fully revert to the pre-pandemic norms. Such changes have included:

A significant increase in flexible and home working, due to many except essential workers spending most of the period since March 2020 working from home or under furlough. This has led to substantial changes in working practices, including widespread use of online meetings and communications through tools such as Zoom and Microsoft Teams. Knowledge-based activity, new and ongoing business and administration have largely been conducted remotely, and many organisations have navigated the use of these successfully. As a result, there has been a fall in the usage of urban office space and many people have had to create home offices. Recent surveys have shown that most employees have emerged from the pandemic with more positive views of working from home [Figure 1]. The most popular preference for future working patterns is for a hybrid working week with some days working in the office and some from home. This suggests that an increase in flexible working is likely to continue even after pandemic restrictions have ended.


Figure 1: University of Nottingham survey on homeworking, Feb 2021¹
 How have your perceptions about working from home changed?



NB: Data is from survey of 4,809 UK residents carried out by Prolific carried out during January and February 2021 on behalf of the University of Nottingham and Stanford University
 (Source: University of Nottingham and Stanford University survey)

There has been a substantial increase in online activity, due to increased time spent at home, social distancing, and restrictions on physical retail. This has accelerated existing trends towards online shopping which in Britain has risen from 20% of all sales pre-pandemic to more than 30% of all sales. Banking, engagement with public services and some healthcare activities are regularly done online. Social and public meetings have often had to take place online, as well as events from celebrations to funerals. Although some of these are likely to revert to taking place physically after the pandemic, many activities have been shown to be viable online that might not have been otherwise expected.

Social distancing regulations have changed how we use places. Local places, especially those outdoors, have become more important, and the need for exercise when gyms were closed has increased the number of people walking and cycling. Outdoor spaces, including National Parks, have seen an increase in visitors, while many organisations with outdoor attractions, such as the National Trust, have had to implement new booking procedures and restrictions to cope with demand. Hospitality businesses have also adapted to different requirements at different stages of the pandemic and some have chosen to continue these.



The pandemic and associated policy restrictions have had a clear **psychological impact**, with increased reports of anxiety and problems with mental health. Isolation and the uncertainty of the evolving situation have potentially increased fearfulness and changed future behavioural patterns, with many saying they are more likely to avoid crowded places in future. Surveys have shown that older people are more likely to be hesitant in resuming pre-pandemic activities than younger people.

The evidence collected by the ITC indicates that the Covid-19 pandemic has accelerated pre-existing trends as well as shaping new ones. The digitisation of the UK economy has been strongly boosted by the pandemic. There has been a rapid shift towards the use of online public services, including for health purposes, such as GP consultations, educational purposes such as online lessons, and accessing social services. The cost savings and efficiencies generated by these measures has encouraged organisations to look into making some of these initiatives permanent. Digital replacement has also been extended to leisure activities, for instance with new provisions for the online viewing of theatre, film and musical performances. While many of these activities are likely in due course to resume physically, this trend is likely to reduce some of the need to travel in future, for example to access public services. The move towards flexible working patterns was already underway before the pandemic but has been massively accelerated. However, we should be aware that this has been much more viable in some professions (especially those linked to the knowledge economy) than in others (such as construction and hospitality) where physical presence is necessarily required.



2.2 Impact upon the movement of people

Unsurprisingly, the impacts of the pandemic have been particularly dramatic on travel demand and behaviour. During the various lockdowns in the UK, travel for work, business and educational purposes has been reduced. As restrictions have eased we have seen travel partially recover, although this has varied by mode. Demand for long-distance and international travel has been severely impacted, and it is probable that international travel will take the longest time to recover, due to the likelihood that travel restrictions and conditions will be imposed on those global regions/countries where the virus is not under control or where variants of concern are circulating. In this paper, however, we will focus principally on domestic travel in Britain where the existing data is most robust.

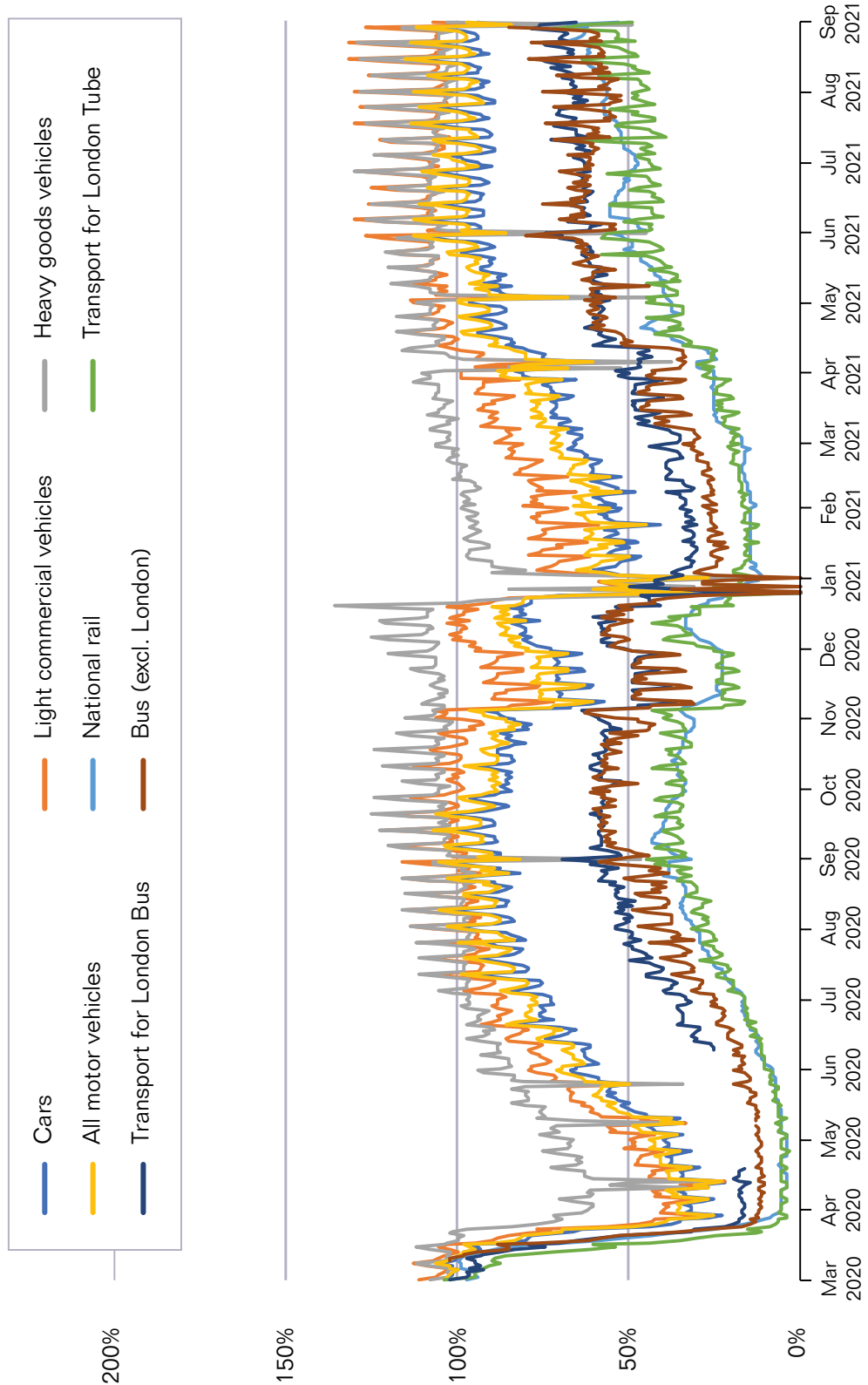
Some of the most significant impacts on travel have been:

A fall in overall travel demand. This was particularly acute during the first lockdown in Spring 2020. Travel showed a partial recovery, especially in terms of road traffic, as these restrictions were eased, but demand fell again during subsequent lockdowns. Unfortunately, there is limited evidence on how travel demand overall has been affected by region. However, emerging evidence on strategic road network traffic trends showed that most regions in England have seen similar trends except for the South-West, which saw lower traffic during periods of lockdown than other regions, but higher levels in the Summer of 2020 and 2021, reflecting its status as a holiday destination.

Travel impacts have varied significantly by mode. Trends since the start of the pandemic can be seen in Figure 2, in which demand is tracked across various transport modes relative to March 2020. Car travel declined dramatically during first lockdown but was less impacted during subsequent lockdowns, and has now recovered almost to pre-pandemic levels. Goods traffic on the road now substantially exceeds pre-pandemic levels, up by about 15-20%. On the other hand, travel by rail and the London Underground (both of which have a high proportion of commuting and business travel) fell to only 5% of pre-pandemic levels during the first lockdown, and have since (August 2021) recovered to about 60% of their previous level. Bus travel outside London has recovered to about 60% of pre-pandemic demand during weekdays, with a stronger recovery at weekends to above 70% of pre-pandemic levels. Active travel modes, including walking and cycling, increased dramatically during the first lockdown and over Summer 2020, but the data is clear that these modes are very seasonal, and much less used during the winter months when weather conditions and the long hours of darkness make them less appealing.

Figure 2: Travel by selected modes in Great Britain since the start of the Covid-19 Pandemic

NB: All modes are indexed to 100 on the 1st March 2020 to show the relative change in usage since the start of the pandemic



(Source: Department for Transport)



The impact on travel behaviour has varied by journey purpose. There has been a very sharp fall in commuting and business travel as workers have been advised to operate from home where possible during much of the pandemic. During those periods when schools and universities were closed, travel for educational purposes plummeted. Leisure travel also fell initially but has recovered more strongly than commuting travel, with travel at the weekend by public transport now (August 2021) much closer to pre-pandemic levels than weekday travel, and car travel at weekends exceeding pre-pandemic levels. Long-distance rail travel has also recovered more quickly than shorter-distance journeys. Some of this is likely due to taking opportunities for family/social visits and domestic vacations. Due to the restrictions on international travel there is likely to have been some transfer to domestic travel as people vacationed in Britain rather than abroad.²

Public transport demand has been negatively impacted by fears about the risks of virus transmission in crowded places. The Government's initial stay at home message contributed to this perception and has possibly resulted in some modal shift to the private car. However, studies to date have shown that, when public health measures are observed, the risk of virus transmission on public transport is very low: indeed, a recent investigation found no traces of the SARS-CoV-2 virus at major rail stations.³ Although steps are being taken to improve hygiene and ventilation and minimise transmission on passenger transport, more work will be needed to reduce fears of virus transmission. Ongoing public health activities will be needed on vehicles and at stations and airports to ensure these places are seen to be hygienic and safe.⁴

There was a clear boost to active travel during the first lockdown, especially walking and cycling. This was likely enhanced by the good weather across much of the country during Spring and early Summer 2020, and the use of these modes for daily exercise. Cycling fell back during the winter months, but remains above pre-pandemic levels during spells of good weather and at the weekends.

2 <https://www.travolution.com/articles/116422/guest-post-covid-19-and-the-rise-of-domestic-tourism>

3 Imperial College London study, August 2021, <https://www.imperial.ac.uk/news/227473/covid-19-sampling-study-finds-trace-virus/>

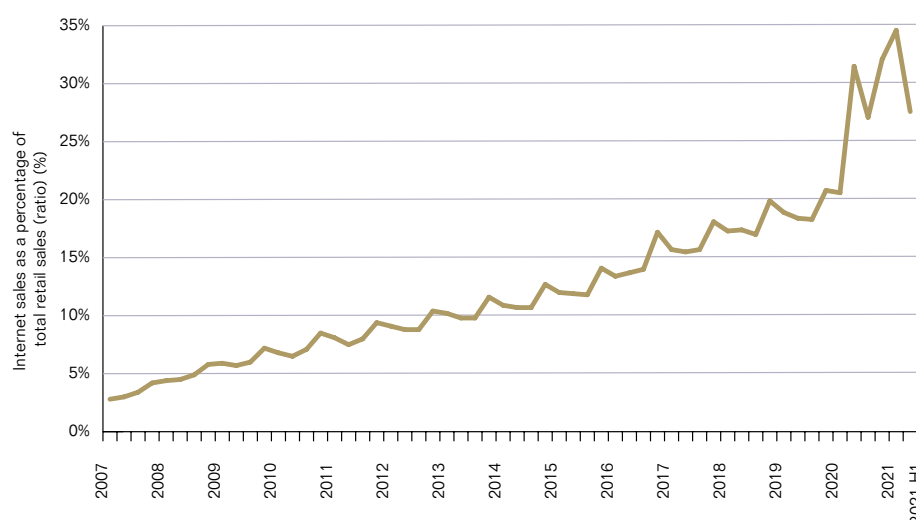
4 <https://www.timeout.com/travel/how-safe-is-it-to-fly-right-now-safety-planes-airports>

2.3 Impact upon the movement of goods

The restrictions caused by the pandemic have accelerated a number of trends which affect the transport of goods. These are likely to have long term impacts on the formation of transport and planning policies. Key trends have included:

There has been an increase in online shopping and retail to record levels, likely due to the restrictions on leaving one's local area, and the closure of all but essential shops [Figure 3]. Internet sales as a percentage of all retail jumped from 20% pre-pandemic to over 30% during 2020. For vulnerable people this led to increased online shopping for groceries and other essentials, forcing supermarkets and other retailers to upscale rapidly their capacity for home deliveries.⁵

Figure 3: Internet sales as % of total retail UK 2006-2021



(Source: Office for National Statistics)

As a consequence, **physical retail shopping has been negatively impacted**, accelerating a trend away from city centre shopping. Retailers have been forced to reconsider their strategy as well as their need for physical retail space in urban centres, causing stores such as John Lewis and Gap to make widespread closures. This trend could have effects on urban land use and transport policy if fewer city centre deliveries will be needed by lorries and vans in the future.

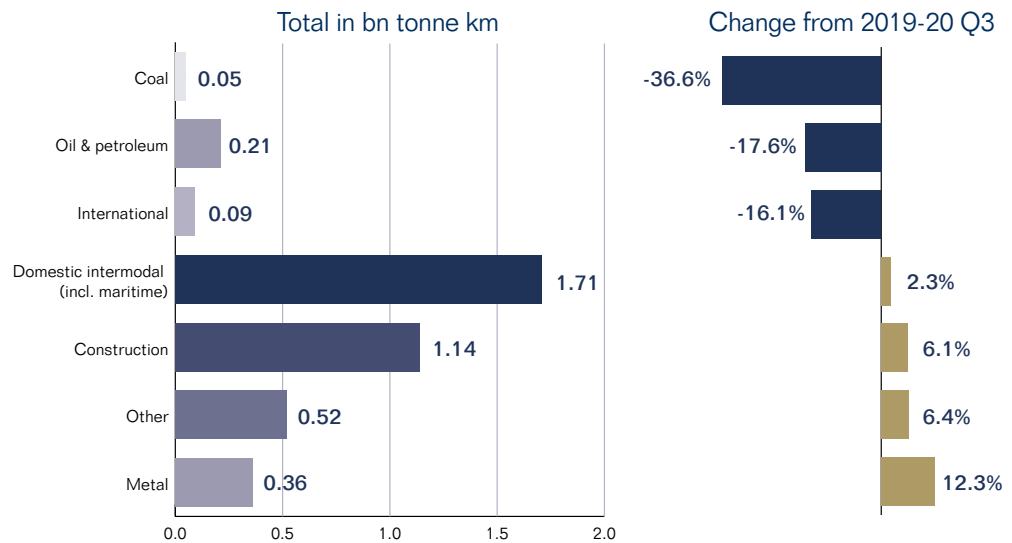
The effects of the pandemic, including driver shortages, illustrated to retailers and manufacturers **the vulnerability of just-in-time supply chains and logistics**. As a result, it is likely in future that warehousing needs in the UK will increase to address these risks, as well as to cope with the increase in online retail. This might accelerate the existing trend towards large out-of-town warehousing distribution centres which are located close to motorways and trunk routes.

Road freight traffic did not see the same collapse as passenger traffic during the first lockdown and recovered swiftly. **Increased demand for home deliveries has strongly boosted HGV and LGV road traffic**. Statistics show that road goods traffic exceeded levels seen before the pandemic by summer 2020 [Figure 2] and by July 2021 such traffic was almost 20% higher than prior to the pandemic.

5 Sainsbury's announced in April 2021 that online grocery orders had risen to 17% of grocery sales in the year since the pandemic started, compared to 8% the previous year (2019-20).



Figure 4: Rail freight in Britain moved by commodity, Q3 2020-21 vs Q3 2019-20



(Source: ORR)

Rail freight has recovered but was negatively impacted in the early stages of the pandemic. Due to significantly reduced demand for the transport of aggregates, new cars and aviation fuel, rail freight initially fell to about 40% of pre-pandemic levels. However, rail freight has since rebounded, as construction and car sales reopened, and intermodal freight demand increased [Figure 4]. The reduction in passenger services has also allowed for more rail freight pathways in the timetable, and increased reliability, improving the service offered.⁶

2.4 Scenarios for future travel behaviour and demand

Where the impacts of the pandemic have accelerated existing trends these are unlikely to be reversed easily. This includes the trend towards more online retail and more flexible working patterns. However, those impacts that have reversed previous trends or inhibited natural behaviours and habits (such as our innate desire to travel as explained in the ITC's *Why Travel?* book⁷), are less likely to be permanent. Much will depend on how quickly existing restrictions caused by the pandemic will be lifted – normally the longer a behaviour or condition exists, the harder it is to change. Journey purpose may be a key factor in determining which travel behaviour is prioritised, with anecdotal evidence that travel to see friends and family is prioritised above business purposes.

⁶ <https://www.railengineer.co.uk/rail-freight-in-the-pandemic/>

⁷ *Why Travel? Understanding our need to move and how it drives society*, ed. Beuret & Niblett (Bristol University Press, 2021).

Many respondents to the ITC's consultation had been exploring a variety of scenarios for the future of travel behaviour, but these are highly dependent upon the nature and timeframe of medical advances. Possible scenarios through the pandemic include:

- 1.** Vaccines provide effective and long-lasting immunity to future virus variants, and despite the rapid spread of the Delta variant in Summer 2021 few people fall seriously ill and the NHS is not overwhelmed. Public confidence is restored in physical meeting in or travelling through crowded areas. Few new public health control measures are required resulting in the swift return of travel demand to near pre-pandemic levels across most modes.
- 2.** New global virus variants appear during late 2021, and vaccine efficacy wanes, requiring a vaccine booster programme (perhaps on an annual basis) Public health measures need to be temporarily reimposed, while fears about transmission in crowded spaces are slow to reduce. This results in a slower recovery of demand for passenger public transport and increased dependency on car travel in the short to medium term.
- 3.** Major problems emerge with the vaccines, perhaps due to poor effectiveness against dangerous new variants or unforeseen side effects and vaccine hesitancy among certain groups. Waves of infection occur periodically causing the NHS to become overwhelmed and public health measures repeatedly imposed as new medical advances are sought. Travel demand remains sharply reduced for passenger transport and many behavioural shifts become permanent.

At present (August 2021) the second scenario appears most probable, although there are early indications that behaviour in response to the virus varies by age group. If so, we should expect passenger transport levels to gradually recover as restrictions are eased, though some demand (such as for commuting 5 days a week) will probably be permanently inhibited compared to pre-pandemic levels. Changes to logistics and the rise in online retail/home deliveries are likely to be permanent under all scenarios, since these represent an acceleration of pre-existing trends. The implications of which scenario emerges will be significant for transport planning and also for achieving low carbon and clean air targets. Indications are that Nitrogen dioxide levels in urban areas were already exceeding pre-pandemic levels by September 2020, and increased reliance on car use in cities could worsen the situation.⁸

3. Land Use and Planning

3.1 The impact of the pandemic on cities, towns and rural locations

The pandemic has had a significant impact on where and how we use work and home spaces. Restrictions initially had a major effect on cities and urban areas, with the ‘stay at home’ lockdown order reducing activity in major urban centres. The loss of international tourists has had a significant impact on key international tourist locations such as central London; however, in some areas the loss of these visitors has been more than offset by a rise in domestic tourists. National Parks such as the Peak District, Lake District and North York Moors saw record numbers of first-time visitors in summer 2020 and some described it as their busiest season ever. Early indications are that Summer 2021 will also be strong for domestic tourism.

These insights indicate that the effects of the pandemic have been different between urban and rural areas, as well as between different sizes of city. Data sources such as the Centre for Cities footfall tracker show that, although all city centres saw a fall in pedestrian activity after the first lockdown, this was greatest in the largest cities such as London, Birmingham, Edinburgh and Manchester. However, a number of cities are now showing signs of increasing activity and recovery as pandemic restrictions are eased.⁹ The high proportion of the labour market working from home has also changed priorities as people place greater value on local amenities and green spaces for recreation and leisure.

Much is still unknown about how permanent these changes will be, although their impacts raise a number of important issues affecting how we think about land use and planning in Britain. The housing market has seen a rise in demand for rural and suburban locations with more space indoors and out; would the continuation of such a trend require changes to planning policies? If the reduction in demand for urban retail and office space is permanent, should this be converted to residential development instead? And what do behavioural changes mean for the way cities and towns should be designed and operated? We will explore some of these aspects in further detail below.

3.2 The impact of hybrid working patterns on land use

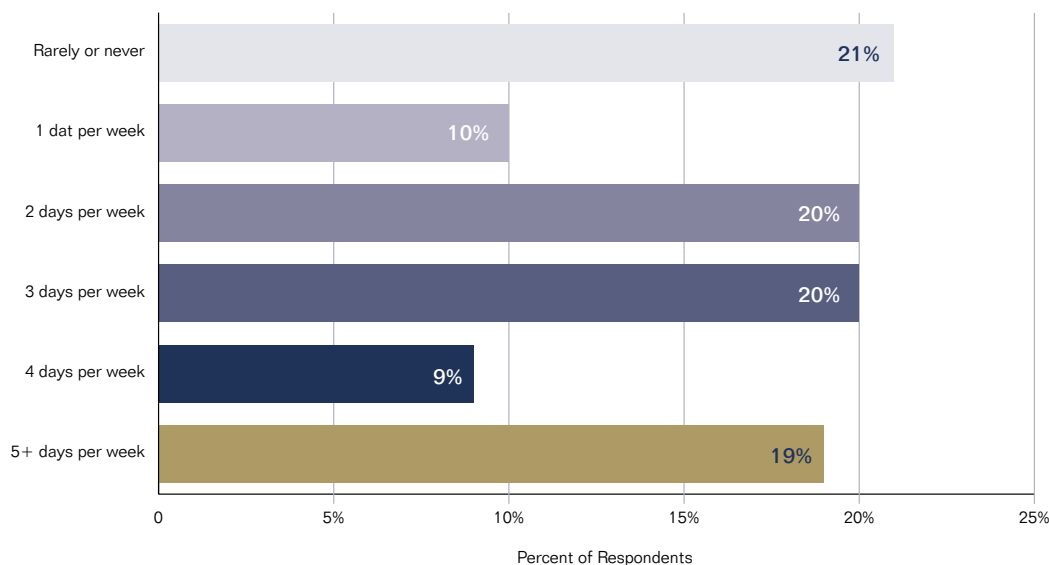
Changes in working patterns as a result of the pandemic have accelerated sharply a pre-existing trend towards hybrid working. More than 50% of employees in the UK have been working from home at some point during the pandemic, although it should be recognised that this was not an option for certain categories of essential workers, and younger people often struggle with cramped accommodation unsuitable for homeworking. Nonetheless, the ability to work at least some of the week remotely rather than from an office has been seen positively by most employees, as reflected in recent surveys. In a recent study by the University of Nottingham and Stanford



University, UK workers were asked about their preferred working patterns after Covid-19 crisis in 2022 and beyond. Almost 80% of respondents expressed a desire for at least one day a week to work from home, and 50% expressed a preference for this to be at least three days per week [Figure 5]. Respondents also indicated that they believed they had been more productive working remotely.

Figure 5: Hybrid working plans in 2022 and beyond

Q: In 2022, how often would you like to have paid workdays at home?



(Source: University of Nottingham & Stanford University survey)

Many leading companies are now launching reviews of working practices as a result of the experience during the pandemic. In the finance sector, Lloyds Banking Group, Deutsche Bank and NatWest have announced plans to develop hybrid working models to allow more flexibility, while fintech leader Revolut has announced plans to enable remote working, including up to two months overseas per year. Other major employers, such as Centrica and Aviva have confirmed that hybrid working will be a permanent feature of their future plans.¹⁰ This is also being considered in certain areas of the public sector. For instance, the UK Civil Service announced in April 2021 that it would pioneer a new hybrid working strategy, including the use of a network of co-working spaces in locations outside London.¹¹ At the same time, there is a recognition that flexible working will bring challenges for employers, including how to manage hybrid virtual and physical meetings, and the Monday/Friday problem, in which all workers choose the same days to work from home and the office.

Although the extent of the adoption of hybrid working post-pandemic is difficult to predict, even a modest move in this direction is likely to have impacts on land use and planning. First, the trend towards the use of shared workspaces in cities is likely to accelerate. Offices with good facilities for hot desking, including the opportunity to use meeting and virtual conferencing rooms to allow collaborative discussion, are likely to be preferred, and demand for these could well increase in regional cities.



Many companies have committed to retain city centre office locations, although the design and size of these could change. Sir Howard Davies, the Chair of NatWest, has predicted that office life in London will never return to the pre-pandemic situation and hybrid working will become permanent.¹² As a result, the physical office will need to complement the digital office, perhaps with a greater focus on opportunities for social interaction and maintaining improved hygiene measures.

It is important to note that not all cities will be affected by an increase in hybrid working to the same extent. Research from the University of Leeds has indicated that those cities with high levels of the workforce in the knowledge economy, such as Edinburgh, Bristol and London, have seen a higher level of working from home than cities where employment is more skewed towards manufacturing and logistics occupations, such as Glasgow, Liverpool and Newcastle. This has affected the response of local authorities to the pandemic. Some authorities, such as the City of London, are already thinking that the scale of urban office space required in future will be lower, and are planning to convert empty office blocks into residential housing.¹³ In the near term, reduced footfall could have a knock-on effect on city centre service businesses such as coffee shops and dry cleaners, although services in residential locations with a greater number of homeworkers could benefit. In this context, small towns, villages and suburban locations could require upgraded facilities, such as improved internet connectivity, hubs for meetings, and more local service retailers.

Transport and mobility are also likely to be connected to the future shape of the office and city usage. The pandemic has created a more extreme aversion to overcrowded places, especially on mass transit which is required to access many urban offices. How quickly these fears recede will influence how many people are willing to commute at peak hours into urban centres. The timing of travel to work may remain spread with longer and flatter peaks. An increased preference for walking and cycling might mean that hard to access workplaces will be out of favour, or alternatively that offices in close proximity to parks and green space will be preferred. And given the likelihood that national and local measures to reduce carbon emissions will take on an even higher policy priority after the pandemic, it seems probable that combustion engine car use will be increasingly discouraged in city centres.

3.3 Changes in residential needs

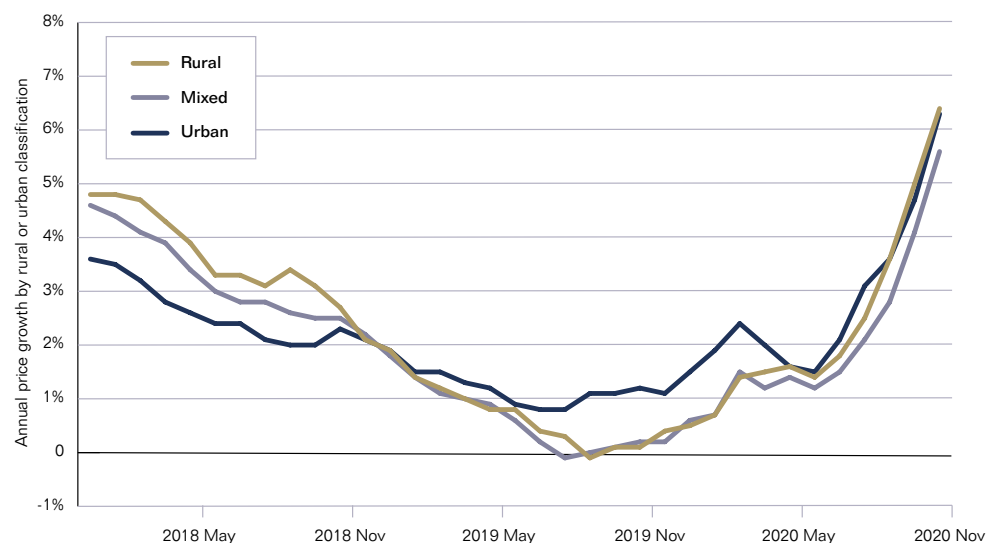
The behavioural impacts of the pandemic have also been significant on how we use and value our homes. The instruction to work from home where possible, and the move towards online learning at schools and universities during the lockdowns, have forced many people to re-evaluate their housing needs and how they use their home spaces. Bedrooms and living rooms have had to be redesigned as offices, classrooms or exercise spaces as a result of the restrictions, with multiple members of a household competing for physical space and bandwidth. The importance of high quality and reliable online connectivity and digital infrastructure has never been more apparent.

12 London office life not likely to return to pre-Covid practices?, Natwest Chair admits, <https://www.theguardian.com/business/2021/jul/21/london-office-life-not-likely-to-return-to-pre-covid-practices-natwest-chair-says> (Jul 21 2021)

13 <https://www.bbc.co.uk/news/business-56888615>

Residential location has been a key consideration during the pandemic, and much debate has centred on whether there has been a flight from crowded urban locations to more spacious rural and suburban settlements. Contrary to initial expectations, the pandemic in the UK has generated a surge in people wanting to move home, with sales approaching 15-year highs by Spring 2021. Estate Agents and property portals have suggested that the phenomenon of urban flight has been particularly acute in central London, where extremely high housing costs act as a powerful incentive to find better value in locations outside the city, such relocations seeming more feasible when a five day commute is replaced by two or more days working from home.¹⁴ This has led some analysts to explore whether cities will experience a hollowing out of their centres, as people move to the periphery rather than the core. In the US, there is some evidence of this happening, with a resulting 'donut effect' as people move to lower-density and often lower-cost suburbs.¹⁵ However, in the UK rumours of the death of the city also seem exaggerated, with urban locations remaining popular with younger people and those without access to a car, particularly as hospitality, cultural and sporting activities have restarted. Data from the ONS shows that during the pandemic property prices rose just as quickly in urban areas as in rural ones, indicating that demand remains strong for city living [Figure 6].

Figure 6: House price growth in rural and urban areas of GB, 2018 to 2020



(Source: Office of National Statistics)

At the same time, perceptions of what people need from their homes has been changing. Surveys by Rightmove early in the pandemic indicated that almost 50% of renters and 40% of homeowners claimed that their priorities in terms of housing needs had changed. Increasing weight was given to flexible home layouts, having separate rooms that could be adapted as an office or teaching space, as well as having gardens/outside space and good internet connectivity. Survey work by the Royal Institute of British Architects (RIBA) in Autumn 2020 revealed that almost 80% of homeowners wanted to make changes to their homes as a result of the pandemic, with a quarter wishing to reconfigure their existing space, and 40% desiring to

14 <https://www.theguardian.com/business/2020/aug/27/uk-housing-demand-soars-since-end-of-covid-lockdown>

15 Ramani & Bloom, 'The Donut Effect of Covid19 on Cities', National Bureau of Economic Research Working Paper 28876 (May 2021) <https://www.nber.org/papers/w28876>



incorporate improved environmental design features, including more natural light and better soundproofing.¹⁶ A further issue in terms of changing housing needs during the pandemic has been the rise of intergenerational living, with parents and adult children increasingly cohabiting in order to form their own household support units and reduce overall costs in a period of employment uncertainty.

Unsurprisingly this has implications for the future design of residential developments in urban as well as rural areas. Developers have responded by reviewing their plans for future schemes, giving more weight to facilities such as a home office and garden access for houses, or to balconies and bicycle storage areas for urban apartments. With pressure growing to move towards low-carbon electric mobility, a major challenge is also to provide sufficient charging facilities and space in new developments for electric cars and e-bikes, the use of which is likely to grow dramatically in the next few years.

Others have been looking at how to incorporate more flexible living spaces, with the use of partitions and temporary rooms for different usages.¹⁷ A further consideration for developers and urban planners is the impact of the rise in online shopping and home deliveries. Parking spaces for delivery vehicles, and local consolidation centres or collection hubs, are among the facilities that can help to accommodate this trend. New design guidance or regulation here would be helpful, since these trends have impacted movement models used to anticipate vehicular trips associated with new developments.

3.4 Implications for commercial, residential and urban planning

What will these developments mean for commercial, residential and urban planning? At the macro scale, lower demand for office space could see more conversions into housing of commercial buildings in city centres, as well as a blurring of the distinction between residential and commercial zones. Indeed, the pandemic has regenerated interest in the concept of the 15-minute city [see Box opposite]. This would see all essential amenities based within a fifteen minute walk or bicycle ride of people's homes. The concept correlates with the ideas of the urbanist Jane Jacobs who promoted the benefits of neighbourhoods

The 15-minute city

The concept of the 15-minute city in urban planning has received increased attention during the pandemic with the Mayor of Paris, among others, praising its benefits. It is based on the idea that urban residents enjoy a better quality of life when they can meet most of their needs within a fifteen-minute walk or bicycle ride of their homes. One model, proposed by urbanist Carlos Moreno, is that this will result in a polycentric city, with multiple nodes where density is more pleasant. It has also been described as a return to local living. Recent research for Arup has indicated that while residents in Madrid and Milan felt their cities met this concept, in London access to essential amenities took longer – about 25 minutes.

16 <https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/pandemic-reveals-demand-for-uk-home-transformations>

17 <https://www.building.co.uk/focus/rethinking-design-housebuilders-initial-responses-to-the-pandemic/5108302.article>

where there are multiple uses, with public space and amenities used around the clock developing a sense of trust and community.¹⁸ A greater appreciation of green spaces, parks and gardens as a result of the pandemic also points in the direction of giving greater weight to these spaces in urban design, and some cities are already taking steps to encourage the creation of communal rooftop gardens. It is possible that urban local authorities will take a firmer approach on requiring developers to provide shared outdoor amenity space for the public, residents and building users.

There are also lessons emerging for residential developers, with a greater need to design more space for home or communal offices, include extra local amenities and place a greater emphasis upon green public space and areas for people to meet. The concept of the Garden City, initiated by Ebenezer Howard and already popular before the pandemic, has received a strong boost as a result of the pandemic, and it is likely this will be promoted for new settlements. To meet low-carbon and clean air objectives, developers will also need to give due attention to providing more facilities for active and sustainable travel, more e-charging options for electric vehicles, as well as reducing car dependency, which has been a major problem with many recent housing schemes. Developers may be required to provide education, healthcare and social facilities alongside residential property. The Mulberry Park development in southern Bath is a good example where these facilities have been placed at the core of the masterplan to widespread acclaim.

In terms of planning, transport and mobility considerations will need to be rethought as a result of the pandemic. For a start, the acceleration of e-commerce and online retail will require more local distribution hubs as well as accommodating greater demand for warehouse space in strategic locations. The massive rise in the purchase of e-bikes indicates that these will become an increasingly important feature of mobility in urban and suburban areas, for which planners need to respond accordingly. One key initiative during the pandemic has been the implementation of low traffic neighbourhoods (LTNs). These involve streets being closed to through traffic via the use of obstacles such as bollards or planters, allowing neighbourhood access only. Many of these schemes have been welcomed, with a DfT survey in late 2020 suggesting that more than 80% of respondents approved of local measures to reduce traffic congestion and improve air quality.¹⁹ However, LTNs have not been without some controversy and have attracted protests, with some disability groups complaining that the schemes have blighted their lives through increased journey times since they have no option but to use a car. Others have argued that LTNs often simply redirect traffic to neighbouring areas, merely displacing congestion and air pollution.²⁰

18 See Jane Jacobs, *The Death and Life of Great American Cities* (New York, 1961)

19 DfT/Kantar, Public Opinion Survey on Traffic and Road Use (November 2020), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/934617/DfT-Public-Opinion-Survey-on-Traffic-and-Road-Use-Phase-1-Report.pdf

20 <https://www.thetimes.co.uk/article/low-traffic-zones-cause-long-delays-for-disabled-jkpnvnc8f>



Much will depend on how long-lasting the behavioural impacts of the pandemic are, but it is important to consider that many pre-existing policy goals from before the pandemic, such as reducing carbon emissions and improving public health, will still apply. Among the key considerations will be:

- In **Residential planning**, review minimum space standards for houses/flats. There is a tension between the need for denser living for more effective land use, and the demand for more space dedicated to private and communal gardens and homeworking. Planners need to focus on wider health outcomes and more holistic measures such as access to facilities and outside space, as well as meeting quantitative design standards.
- **Commercial planners** will need to rethink the design of office space, especially if demand increases for shared workplaces, meeting areas and green space. Measures will be needed to increase cycle parking and showers at offices in order to accommodate the rise in active travel, and possibly layouts will need to facilitate social distancing. The relationship between offices and retail and hospitality also needs to be considered in city and town centres.
- **Transport planning** will need to accommodate greater use of e-commerce, including consideration of how to provide efficient local distribution and pickup hubs to minimise environmental impacts, as well as adequate parking and offloading space for deliveries. Provision for electric charging points for e-cars will be essential in new developments, as well as measures to offer good and flexible public transport provision for those without cars.
- Longer-term impacts could also be felt in **rural areas**, where demand for housing could increase as a result of hybrid and remote working. If the trend continues for more domestic vacations, National Parks and other scenic areas could require additional funding and measures to cope with touristic overcrowding and an increase in anti-social behaviour such as fly-tipping and fly-camping which has blighted many such areas since the pandemic started.²¹

4. Transport Infrastructure

4.1 Impact upon Fixed and Other Infrastructure

This section covers fixed infrastructure – such as rail tracks and roads – as well as the other infrastructure that is required to operate transport networks such as bus, rail and road service stations, as well as motive power and vehicles where they are integral to the infrastructure (such as for rail and metros).

The immediate impact of the pandemic has been a significant reduction in travel when 'stay at home' and 'lockdown' restrictions were put in place at different stages of the pandemic. This initial reduction coincided with people travelling significantly less distance and with reduced frequency for work (commuting and business travel) and leisure purposes although in the freight sector, traffic returned relatively quickly to close to previous volumes [See Figure 2].

The move to encourage active travel, particularly local cycling and walking, has led to the reconfiguration of the infrastructure of local streets. These have been turned into LTNs or, with other changes to accommodate social distancing or outside seating, have become spaces for bars, cafes and restaurants to use. In many cases the normally lengthy consultation processes for approval have been bypassed since these are temporary measures which have gone straight to 'full trial'. There is some evidence that initially temporary measures are being made permanent, or at least continuing, in many towns and cities, including many London boroughs as well as in smaller cities such as Bath and Oxford. This reshaping of infrastructure may help to reinvigorate local high streets as areas become more pleasant to use and active travel and sustainable 'last mile' freight is encouraged.

There has been strong ongoing messaging to discourage the use of public transport in order to ensure that capacity is available for key workers and essential journeys. This has reversed the efforts made by local and central government over many decades to encourage greater use of public transport as more sustainable. Social distancing at 2 metres (or even 1 metre plus) has led to the reconfiguration of stations and train vehicles to accommodate one-way systems. This has resulted in reduced useable capacity, but significant retained operational capacity: for example, the volume of national rail services operated was cut in the first lockdown in Spring 2020 to approximately 55% of pre-pandemic levels but with about 10% of passenger volumes. More recently, services have been at approximately 90% of pre-pandemic levels but carrying 10-30% of previous passenger volumes in Spring 2021 (See Figure 7). Buses carry a 'bus full' sign for when the socially distanced capacity has been reached. When schools returned to classroom teaching in March 2021, priority was given to students on public services in many areas, including London, where TfL made scheduling changes to accommodate this.

Figure 7: Liverpool Street Station on Thursday 17th June 2021, 08:07
– what used to be the rush hour.



(Source: Independent Transport Commission)

Transport providers have had to manage their own workforce arrangements, with the majority of workers being unable to work from home and so many routine processes have needed to be re-configured. For example, cleaning regimes have been significantly enhanced and driver training (which relies on an experienced staff member working closely with a trainee) has had to be re-worked.

The reduced travel on transport networks has provided some modest opportunities for additional maintenance or enhancement work. However, in many cases, work procedures within maintenance teams, and the supply chain for materials have not allowed major changes to the processes. Network Rail's infrastructure maintenance and enhancement programmes are being completed as planned with specific working arrangements in place where necessary. This has included work on Crossrail, the East Coast Main Line and TransPennine rail routes throughout 2020 and 2021. Local councils in many areas adjusted their road repair schedules to complete minor works while traffic levels were light and the weather good during the summer of 2020.

4.2 Changes in infrastructure needs

The pandemic has delivered a shock to transport networks and employment patterns and it is not yet clear what the longer-term impacts will be. Fixed infrastructure has 20-50+ year life so rapid adaptations are likely to be limited. However, there is an opportunity to 'build back better' and potentially accelerate the introduction of more environmental and sustainability measures. Potential changes can be considered at national, regional and local levels.

4.2.1 National networks

National road and rail infrastructure can only be adapted slowly due to the scale of the changes needed, and their associated costs. Major road and rail programmes (such as High Speed 2) currently continue, in part due to the employment opportunities they bring. It is not yet known if there will be new national-level infrastructure schemes announced to boost the economy.

Long distance travel is vital for freight and trade and there are signs that a reshaping of the market may be happening. Long distance passenger travel has reduced but there is evidence from Summer/Autumn 2020, and in Summer 2021, that the social desire to meet friends and family is as strong as ever which is boosting leisure travel within Great Britain.

There is indicative evidence that some business people want to return to face-to-face interactions particularly for creating new business relationships or collaborative working, but many companies have been reducing their business travel budgets so business travel may remain at a reduced level. Typically, business travel has been Monday to Thursday with leisure travel more focussed on Friday to Sunday. Internet connectivity on trains creates the potential for long distance travellers to spread journeys across the week and away from traditional weekday peak periods.

Changed patterns of demand may create different opportunities for national networks, with Sir Peter Hendy, the Chair of Network Rail, indicating that engineering works may need to be timed differently if there is a significant increase in travel for leisure purposes particularly at weekends, which could mean moving potential rail infrastructure closures to midweek.²²

4.2.2 Regional networks

At the regional level, there is a complexity due to the different governance and funding arrangements associated with devolved governments and regional transport bodies. Strategic regional infrastructure networks are managed by National Highways and Network Rail with funding at national level. This is in contrast to countries like France where the regional governmental structures have been fixed for hundreds of years.

It is not yet clear whether regional hubs will benefit from the pandemic and how they can adapt. Towns that have good road and transport links such as Reading, Guildford or St Albans may become of greater importance for businesses and freight logistics, rather than the centre of London. Often locations that are closest to major road junctions are poorly served by public transport so there could be reconfiguration of



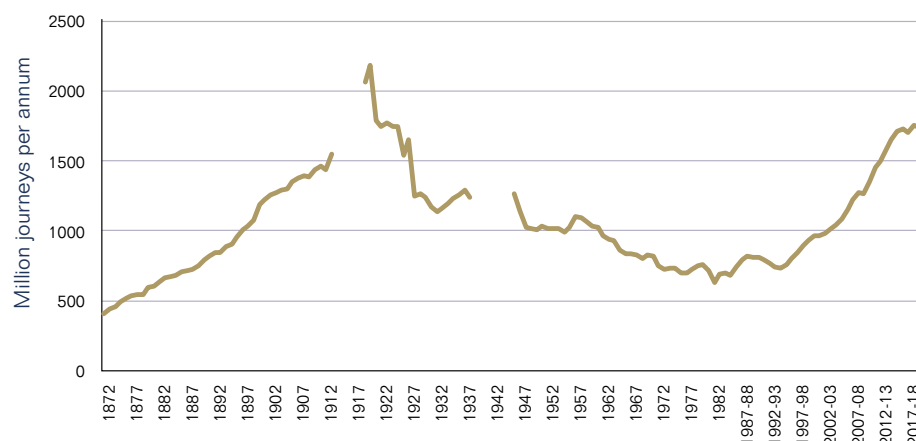
bus or new light rail services to feed 'just off the motorway' locations, or an increase in 'parkway' rail stations at the outer edge of cities but served by intercity rail services. More flexible office and social space at these regional hubs would allow for business collaboration and personal meetings. Railway stations in the Netherlands including Schiphol Airport, Utrecht and Groningen provide good examples of how this can be done.

Regional commuting may well see a re-timing of peak hours as people seek less busy travel times, and there are fewer regular commuters as 'knowledge workers' adopt hybrid work patterns that blend home and office-based work. During the lockdown periods, key workers who needed to attend a specific place of work generally travelled in an earlier morning peak and evening peaks were spread much more widely than previously. Peak commuting into regional city centres is a challenge for transport providers as it is resource intensive for a tidal flow and unpleasant for travellers due to the high demand on the available capacity, and the network impacts of congestion that are widespread. Prior to the pandemic a decline in 5-day a week commuters using season tickets had already been identified and this trend appears to have been accelerated. In response, flexible 'carnet style' tickets and flexible season tickets are now available to meet these new travel patterns.

As rail passenger and train numbers have rapidly risen over recent years, the network impacts of delay have become widespread due to capacity constraints. A 3 minute train delay to a single service can rapidly impact large numbers of other trains and large numbers of people. Similarly, car commuters have had to travel earlier and earlier as networks have become more crowded in order to avoid extended journey times and a minor incident can create a knock-on delay. A greater geographic spread of work-related travel, and a wider time spread that reduces the rush hour peak, would help to ease the congestion that many parts of our road and rail networks had previously regularly experienced.

It is important to note that rail travel had risen in the 25 years before the pandemic, to more than 250% of the demand seen in 1995 [see Figure 8], while at the same time the physical size of the network hardly changed. This brought incredible strain to the network in terms of capacity constraints and overcrowding. If rail travel returns in the post-pandemic world to 80% of the level of demand seen in 2019-20, this would be the same number of journeys seen in 2011, and still almost twice the level seen in 1995. In such a context, a modest fall in rail demand from the extreme levels seen on the eve of the pandemic should help to provide more reliable rail operations. A reduction of the 'high peak' will also improve the passenger experience significantly.

Figure 8: Rail Passenger journeys in Great Britain, 1872 to 2021
Total Passenger Journeys (million p.a)



NB. The graph above illustrates how rail passenger numbers have increased since the 1980s on an infrastructure that has not expanded. A reduction in peak travel, nudged by the pandemic potentially creates an opportunity for a less congested and so more reliable rail network to operate with some spare capacity to give resilience. Source: <https://dataportal.orr.gov.uk/statistics/usage/passenger-rail-usage/>

(Source: ORR)

The messaging that the private car is safer to use in terms of viral transmission may lead to greater car dependency for regional journeys raising funding and environmental challenges. For the road network, a further increase in electric vehicles is expected, and this will require infrastructure changes to create an adequate charging network particularly for longer inter-regional journeys that require rapid charging. The funding and management of this charging network has yet to be resolved. Road pricing has been rejected on political grounds due to its unpopularity, but a potential re-balancing of the economy may offer an opportunity to trial usage charges for the road network. The ITC's research work on road user charging indicates that this can achieve widespread public support if correctly presented and if users believe that they will not have to pay more than through the current system of fuel duty and vehicle excise duty.²³

4.2.3 Local networks

It is perhaps at local level that most of the pandemic-related changes have been observed. Weeks of quieter streets and very rapidly introduced temporary infrastructure changes led to people using active travel means such as cycling and walking in an environment that they felt was safer and more pleasant. Halfords reported bike sales 60% higher in 2020 than 2019 while small local companies such as Avon Valley Cycles reported huge demand for repair of bicycles that had not been used for many years. Emission levels were reduced and many central urban areas were more attractive for locals and visitors alike. In some towns and city centres there have been further moves to encourage sustainable local freight movements with the use of electric vehicles, cargo bikes and better consolidation of loads, although this has not kept up with the rapid increase in the deliveries associated with online sales.

The challenge now is how to lock in the benefits of these new approaches. The crisis on the high street of many towns pre-dated the pandemic by a couple of decades but the recognition that a vibrant high street 'destination' can be an attractor of visitors and businesses has led many local authorities to consider how they will fill empty town centre shops and offices and replace the income from lost rates. The ability to make rapid infrastructure changes to meet local objectives could be a longer-term benefit in local authority governance. Opportunities exist to build on the successful street reclamation schemes that have boosted local community cohesion and improved the take up of active travel [Figure 9]. However, where these are made permanent it will be important to listen to the needs of those who have disabilities or rely on the car for their mobility needs.

Figure 9: Northcote Road in Battersea, London, 2021

This shows the opportunities provided by street reclamation to improve community activities and reduce air pollution.



(Source: Independent Transport Commission)

In the larger cities, there has been a focus on the 'villages' that form local neighbourhoods. People have been shopping and socialising or exercising in their local area rather than travelling to the central business district for work, and then doing other activities there. The City of London Corporation has published plans to boost its share of creative and cultural industries. It has also set a target to add at least 1,500 residential units through new schemes and conversions, noting that 'the Square Mile must evolve in order to provide an ecosystem that remains attractive to workers, visitors, learners and residents'.²⁴ The aspiration of the 15-minute city [See Chapter 3] will require a remapping and a reconfiguration of travel. Typically bus and active travel infrastructure can be more rapidly adapted than light rail or metro systems or major road networks. Housing costs in many UK cities are very high in central urban areas and reduce with distance from the central business district. It is likely that some need for workers to travel from the suburbs to city centres, or to other suburbs will remain. In Paris the **Grand Paris** project aims to improve the links between suburbs rather than just the radial city centre journeys.²⁵ This may well be a model to consider as cities and towns consider the combination of economic and environmental steps to shape their future transport networks.

24 'City of London plans 1500 homes for post-pandemic recovery', Financial Times, 27 April 2021, <https://www.ft.com/content/c59d4058-3ec3-4b94-b459-be92e71a91ff>

25 For more information see: <https://www.societedugrandparis.fr/info/grand-paris-express-largest-transport-project-europe-1061>

4.2.4 'Soft' infrastructure

In considering future infrastructure, it is vital to consider the 'soft' infrastructure of the information networks that can help enable more efficient use of the 'hard' physical networks.

Operators have rapidly introduced apps for queries such as 'is my bus full?' and where to find an emptier carriage on a train. The apps that are good for car journey planning are often weak when applied to active travel modes. A traveller needs to know the options for a journey including the timing and price for these, as well as requiring navigational assistance or reassurance during the journey on timing and location (Am I on the right bus? Is my train still on time? Do I take this street or the next one?) and confirmation of arrangements at a destination (Where do I park? Which station entrance to use?). Needs are well known but the information is in multiple sources and systems which makes passenger travel more difficult. There has been increasing use of 'smart ticketing' on phones and other devices and contactless payments as public transport users have followed guidance to reduce contact and interactions with others such as in ticket offices. This is expected to continue and can reduce transaction costs.

Freight and logistics companies have adapted rapidly to the increase in online ordering and local collection or delivery for fulfilment. In many cases delivery companies already allow tracking by sender or the recipient, although intensive delivery schedules can mean haste in 'finding' an individual home results in a delivery to the wrong location. However, much of the current practice appears inefficient – a supermarket worker empties the retail shop shelves to meet online orders, multiple delivery companies come along any typical residential street throughout the day delivering a single parcel each time. Although there are examples of efficiencies in this area, such as the use of urban consolidation centres in areas such as Camden, there may need to be a pricing or regulatory constraint to avoid damaging environmental consequences.²⁶ For freight and logistics to align with the 15-minute city and carbon neutral targets will require policy and interventions to prioritise the necessary changes to working methods.

4.3 Funding Challenges

4.3.1 Cost and revenue changes due to the pandemic

Transport and infrastructure operating costs have remained high although patronage and revenue (including ancillary revenue from shops and car parks) during the pandemic has severely reduced. This has led to a variety of support packages for the public transport sector at national and regional levels. These financial measures are currently short term with 6-12 month time horizons, and some have been repeated, such as the rail Emergency Measures Agreements, being followed by the Emergency Recovery Measures Agreements. The airline and airports sector has not received specific support.



In Summer 2021, although national public health restrictions have eased, many operators are continuing to require masks and to support social distancing to help restore public confidence and reduce virus transmission. Some of the changes such as cleaning regimes, maintenance design (such as easily replaceable escalator handrails) and station and vehicle configuration are likely to remain and reduce capacity as well as increase costs on an ongoing basis. Experience from East Asia, (where severe acute respiratory syndrome (SARS) in 2003 gave early insights to managing coronavirus on transport networks) indicates that these visible measures can support traveller confidence.

As numbers of travellers begin to return, some transport modes will experience greater challenges than others. Car traffic has revived close to pre-pandemic levels much more rapidly than public transport demand. Buses are the most used form of public transport, and often are used by those, such as key workers or those with lower incomes, who do not have access to alternative modes. The pandemic may lead to a wider recognition that bus services need ongoing taxpayer support as part of a policy focus on 'levelling up'. Rail is potentially facing a long-term crisis with reduced revenue through falls in both passenger volumes overall and significant reductions in those paying the higher fares either as a business traveller or from five-day-a-week commuters with season tickets. Leisure travellers typically pay lower fares due to advance purchases of less flexible tickets, railcard discounts and avoiding the higher-priced peak services although many travel longer distances. It would seem likely that the policy since the early 2000s of the rail traveller consistently paying the greater part of the industry costs (64% from passenger revenue in 2019-20) has now shifted firmly back to the tax payer.²⁷ Significant government support for rail will be needed over the coming years due to the expected loss of the highest paying passengers and the potential need to keep timetabled service levels and train capacity relatively high in order to maintain an attractive offer for would-be travellers.

4.3.2 Appraisal factors – wider societal and environmental benefits

Transport infrastructure funding is typically considered over a 5 to 15 year horizon with appraisals for investment considered over a 15 to 50 year horizon so there is a need to avoid a short-termist cost-cutting reaction to the Covid-19 pandemic. However, it appears that basing business appraisals on the value of time saved is too narrow a perspective.

The pandemic, as well as previous ITC research, has shown that transport and travel can bring health and wellbeing benefits as well as economic activity. Infrastructure and transport services need to be linked to journey purposes, whether shopping or cultural, visiting friends and family, medical or educational as well as for work. We know there are a wide range of reasons for travel and that the human urge to travel and connect is strong and has existed across cultures and millennia.²⁸ Freight may appear abstract to many people but includes 'shopping' and providing those items we need for living in their component parts such as fuel and construction materials.

27 <https://dataportal.orr.gov.uk/media/1889/rail-industry-finance-uk-statistical-release-2019-20.pdf>

28 See the ITC's new book, *Why Travel? Understanding our need to move and how it shapes our lives*, ed. Beuret & Niblett (Bristol University Press, 2020).

The way in which people and freight move has significant environmental consequences. Active travel can bring health benefits as well as having almost no emissions. In the context of climate change, sustainable motive power (electric, hydrogen etc) needs to be considered alongside the infrastructure that provides that power, and the network on which the vehicles operate.²⁹ This consideration of motive power has to apply across freight and passenger sectors together, particularly as new technologies increase the capability of less polluting fuels to provide the necessary force. A focus on these environmental impacts would likely prioritise public-transport-focused schemes above private-vehicle-focused schemes such as road building.

There is scope for much greater alignment between transport policy and wider policy objectives – such as meeting climate change targets, or housing and health related objectives, or goals around levelling up and reducing deprivation. This is already happening in some areas, such as the decision by the Department of Health and Social Care' to take responsibility for the carbon emissions of induced travel journeys for health reasons, which is likely to increase the benefits of holding more online consultations in the future.

A wider field of vision when undertaking transport appraisal, particularly given the longevity of schemes and the potential balancing between Operating Expenditure (OpEx) and Capital Expenditure (CapEx) on a whole-life basis, is likely to increase the societal benefits from any prioritised projects. In the medium term, with ongoing Government financial challenges as a consequence of the pandemic, it seems likely that there will be an emphasis upon lower-cost and relatively minor adaptations and enhancements of transport infrastructure, rather than on new major infrastructure schemes.

4.3.3 Financial challenges

In an economically challenged post-pandemic period, financing challenges for ongoing transport operations and longer-term investment will be more difficult. However, having created a situation when tens of millions have been highly dependent on state support, this may mean that ongoing Government funding to support measures with wider public benefits is far more popular than has been the case in recent decades.

The funding of public transport networks involving services and infrastructure has traditionally seen a major focus on the capital costs of construction and less focus on the ongoing operational and maintenance costs. However, increasing automation and use of artificial intelligence tends to increase capital costs and reduce operating costs, an example being MetroLink: the new GOA4 metro system proposed for Dublin. The *Great British Railways: Williams-Shapps Plan for Rail* (May 2021) has identified the need to modernise many working practices in the rail sector and is targeting cost reductions of up to £1.5 billion a year across the industry and its supply chain.³⁰ However, many of the opportunities to improve rail value for money were identified a decade earlier in the McNulty Review of 2011 and established interests, including some Trade Unions are likely to oppose some of these cost reduction measures. As part of a £1 billion support scheme, TfL has been asked to develop a

29 See report on the ITC's Discussion Evening on sustainable fuels held in February 2020: <http://www.theitc.org.uk/how-can-we-scale-up-the-use-of-alternative-fuels-in-transport/>

30 <https://www.gov.uk/government/publications/great-british-railways-williams-shapps-plan-for-rail>



plan for automated trains on some London Underground lines and this was quickly condemned by the RMT Union.³¹ Strikes were already planned in August 2021 in response to some of the measures TfL has taken to shore up its finances.

The assumption that fare box can cover the majority of public transport operating costs is potentially no longer valid. In the medium term, ongoing public support for transport operators seems likely to be needed. The spreading of peak demand is generally beneficial but will also reduce revenue as higher peak prices will not generate the previous revenue levels. Rail season tickets that discount fares based on a five-day-a-week peak commute are likely to be less attractive if employees are increasingly office-based for only a couple of days a week – potentially accelerating a pre-pandemic trend. Business travellers contribute significant revenue relative to their numbers travelling, particularly for rail and air transport, so a reduction in business travel will impact revenue significantly. Many companies are re-evaluating their staff travel policies, looking for cost savings as well as reducing their carbon footprint by limiting business travel compared with pre-pandemic.

The concept of 'user contributes' could be expanded to include road users to a greater extent. Road tolls are acceptable in many environments and nations, and modern information systems as well as cash-less payment methods can remove the barriers to doing this fairly, with time, distance and vehicle-based measures now being achievable without the need to install toll gates.

'Polluter pays' is an approach already being adopted, with various low emission or Clean Air Zones being introduced in cities and towns at local level such as in Bath from March 2021 and Birmingham from June 2021. It is expected that funding solutions will need to involve a combination of 'stick and carrot' measures to obtain the desired outcome. There is scope for national level financial support for some sectors, such as aviation and freight transport, to be linked to progress towards sustainable milestones, thereby encouraging more rapid deployment of low-emission vehicles and more efficient distribution patterns. This will be necessary to encourage rapid movement towards commitments on 'net-zero' carbon emissions.

The regional level of transport planning can get caught between national and local objectives. Metro-mayors have transport as part of their remit but often without the full funding requirements. The need to take an inter-regional view is reflected in bodies like Transport for the North, but they are often working with national bodies such as Network Rail or National Highways, and are seeking to demonstrate value for money on transport schemes where the economic benefits are not measured as highly as in London and the South East. This might be addressed as the Government announced a review of the Green Book appraisal process in November 2020 to ensure this is aligned with the 'levelling up' agenda of helping economically disadvantaged regions.³²

31 <https://www.independent.co.uk/news/uk/politics/tfl-london-driverless-tube-trains-b1857572.html>

32 <https://www.gov.uk/government/publications/final-report-of-the-2020-green-book-review>

5. Implications for Policy Makers

5.1 Key long-term policy challenges

The implications of the changes caused by the pandemic are substantial for policy making. Many challenges have arisen, but in the current climate of uncertainty it is important to frame these around the major long-term policy objectives that have recently been set by the Government. These key strategic objectives include:

- **Economic Recovery.** The Government's 'Build Back Better' plan focuses on restoring economic growth to the UK as the pandemic recedes. It places investment in infrastructure at the core of this plan, and acknowledges the importance of connectivity to achieving economic recovery. Investment in transport and urban renewal will be crucial for stimulating new jobs, economic expansion and paying off the costs of the pandemic.³³
- **Reducing Carbon Emissions and improving air quality.** The Government has set ambitious new targets for reducing carbon emissions ahead of the UN COP26 Summit in late 2021. The Sixth Carbon Budget will set in law a directive to reduce CO₂ emissions by 78% from 1990 levels by 2035 (the UK has already reduced CO₂ emissions by 51% at the time of writing), with the aim of reaching net zero CO₂ emissions by 2050.³⁴ This highly ambitious target will require substantial investment in decarbonising transport, promoting public transport usage and supporting active travel. Details on how this will be achieved were set out in the Transport Decarbonisation Plan (July 2021).³⁵ In addition, commitments have been made to reduce air pollution from transport. The 2018 National Emissions Ceiling Regulation set strict targets for reducing NO_x pollutants and particulate matter by 2030, much of which is related to transport usage, especially road traffic. Currently, these pollutants are not falling fast enough to meet these targets.³⁶ A Clean Air Strategy was published by the Government in 2019 setting out how these emissions should be reduced.³⁷

33 See UK Government, Build Back Better: Our plan for growth (March 2021) <https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth/build-back-better-our-plan-for-growth.html>

34 UK Government adopts sixth Carbon Budget, April 2021, <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

35 <https://www.gov.uk/government/publications/transport-decarbonisation-plan>

36 UK on track to miss air pollution targets (March 2021). <https://airqualitynews.com/2021/03/18/uk-on-track-to-miss-legal-air-pollution-targets/>

37 UK Clean Air Strategy 2019, <https://www.gov.uk/government/publications/clean-air-strategy-2019>



- **Reducing economic disparities, aka 'Levelling-up'.** The Government has made it a policy priority to address regional economic disparities across the UK, which are wider than in many comparable countries. Currently productivity in London is about 50% higher than in Wales or Yorkshire, while spending on research and development is concentrated in the South-East of England. The Government has made commitments to reduce inequalities across the UK regions through greater investment in poorer cities and regions, with a 'Levelling Up Fund' announced. This policy objective recognises the importance of investing in local transport improvements as well as boosting connectivity and supporting urban renewal to help local economies grow.³⁸
- **Improving our experience of travel.** The Government has made improving the experience of transport users a key policy priority. This includes ensuring that travel supports well-being, as well as making sure people are not excluded from accessibility and mobility opportunities. The Inclusive Transport Strategy of 2018 is designed to deliver better transport for disabled people, while other schemes make clear an objective of improving transport services offered.³⁹ The pandemic has unfortunately potentially widened inequalities in transport, particularly due to reductions in public transport service provision, and it will be essential that public transport investment is maintained after the pandemic if these inequalities are not to worsen.

5.2 Recommendations for strategic policy making

The findings from the ITC analysis indicate that these strategic policy objectives are achievable, but will require additional measures and investment if progress is not to fall behind as a result of the pandemic. Although uncertainties remain, it does seem clear that the pandemic has accelerated a number of pre-existing behavioural trends that are likely to have long lasting implications. These should be taken into account when forming policy. Key recommendations include:

- Sustainability is likely to become an ever-higher priority as the urgency to reduce carbon emissions increases. Steps to encourage electric vehicle take-up will need to include stronger incentives, and the importance of higher public transport usage remains strong if carbon reduction targets are to be met. The immediate reduction in congestion and improved air quality in our cities during the pandemic lockdowns have been widely welcomed by the public, and demonstrated that policies to encourage more sustainable/ environmentally friendly travel behaviours can achieve widespread public support. It will be important to encourage passengers back onto public transport. Furthermore, in order to avoid an expected increase road traffic arising from the crisis, as well as to achieve the policy objective of phasing out petrol and diesel vehicles, new road user charging mechanisms and parking charge schemes must be implemented promptly.⁴⁰

38 UK Government, New Levelling Up and Community Investments (March 2021), <https://www.gov.uk/government/collections/new-levelling-up-and-community-investments>

39 UK Government, Delivering the Inclusive Transport Strategy (updated September 2020), <https://www.gov.uk/government/speeches/inclusive-transport-strategy-year-2-update>

40 A good example is the Nottingham Workplace Parking Levy: <https://www.nottinghamcity.gov.uk/information-for-residents/transport-parking-and-streets/parking-and-permits/workplace-parking-levy/>



These can incentivise behavioural change such as reduced car usage, thereby lowering emissions and diminishing congestion. ITC research has demonstrated that such schemes are publicly acceptable if the benefits are made clear.⁴¹

- Investment in transport infrastructure will be essential to help our public transport networks recover from the crisis, and to help kick start the economy through job creation and economic stimulus. The appraisal process for transport schemes will need to be revisited to ensure that the right objectives and benefits are correctly identified. For example, journey time savings may now be less relevant than environmental and social/community benefits. Local, small-scale interventions such as active street re-design may be of immediate benefit, while major transport infrastructure investments should continue and be accelerated as a means of encouraging economic growth and maintaining employment.
- Transport operators will need public sector assistance to recover from the worst crisis in recent history with a massive reduction in passenger numbers travelling, or risk a rapid contraction in travel services provided. Policy examples from East Asia might be instructive in terms of encouraging the return of passengers to public transport with a combination of mask wearing and enhanced hygiene measures. Bus and rail operations are likely to require ongoing support and different models of funding. This will be vital to maintaining early and late services often used by key workers, and keeping adequate frequency to give passengers flexibility of journey timing.
- Land use changes are likely to see a reconfiguration of office space and design, as well as changes in residential demand, which remains extremely high in the UK. 'Tactical urbanism' could be adopted to make better use of urban land in response to the blurring of boundaries between residential and commercial uses. The city is not dead, but policy makers will need to rethink priorities in order to attract people back to city centres, with greater emphasis on green spaces and meeting places. If demand for commercial space in urban areas decreases, this could be compensated by converting office space into residential units, helping to address the lack of housing supply in many UK cities. Online retail is likely to increase further, requiring innovative approaches and updated urban design and transport guidance in order to avoid worsening congestion and air pollution.
- Travel provides important benefits for mental and social well-being.⁴² Some categories of key workers are unlikely to benefit from the move towards more flexible working hours, and so attention should be given to how they can travel safely at peak hours or at unsocial times to meet 24/7 shift requirements. The pandemic has affected different groups in society in different ways, and policy makers will need to ensure that the crisis does not result in greater social exclusion or in poorer access to transport amongst lower-income groups, such as losing vital bus and/or rail services.

41 ITC and Social Research Associates, *Paying for Roads and Road Use: Attitudinal Report* (2016). http://www.theitc.org.uk/wp-content/uploads/2016/03/0995-159_Road-pricing_Mar2016.pdf

42 See the ITC's work on *Why Travel?* (2021), op. cit. footnote 7.



6. Conclusion

The nature of the Covid-19 pandemic means that it is very difficult to predict future trends and timing with any degree of certainty. In this paper we have provided an overview of the evidence as it stands in Summer 2021 on the impacts of the pandemic on domestic travel demand, land use and transport infrastructure.

One key finding is the way in which the pandemic has accelerated a number of pre-existing trends which impact transport and land use, including the rise of online shopping, the move towards digitisation of services and communication, an increase in flexible and home working, and growing concerns about environmental impacts and climate change. At the same time, new behavioural issues have emerged, including a greater interest in hygiene on public transport, increased anxieties about overcrowding, and a desire for more open green space around where one lives and works.

The impacts on land use and planning are likely to be significant. Although the city is certainly not dead, and likely to recover as the pandemic recedes, usage of office space and city centres is likely to change. A reduction in office space could provide an opportunity for more residential units in city centres, while the design of new residential developments should reflect changing preferences and needs. Increasing online retail is likely to bring new challenges in terms of congestion from local deliveries and the increased need for warehousing and consolidation centres. Meanwhile, some of the initiatives arising from the pandemic, such as reformed street design and low traffic neighbourhoods, could be made permanent with the consent of local residents.

Although travel demand for public transport is likely to recover as the pandemic recedes, Government interventions and support will continue to be needed in the short to medium term. In the context of the Government's wider policy objectives such as carbon reduction, 'levelling up' regional disparities and improving passenger experiences, boosting public transport usage has a crucial role to play in achieving these. Buses, for example, are often an essential mode of travel for key workers and those on low incomes, and a loss of services could seriously worsen regional inequalities. Rail travel, meanwhile, remains the most efficient means of inter-city travel and transporting large numbers of people to and from city centres. The permanent loss of some business and peak hour travel will, however, mean that more state financial support and control is required to ensure rail services remain viable.

The pandemic also provides an opportunity to reshape transport and land use policy in ways that supports the net zero carbon target. Encouraging more people into active travel, lower levels of commuting, and greater support for low carbon and collective transport modes can together make a substantial difference in terms of moving to a low carbon future. While the pandemic is not yet over, we encourage policy makers to start thinking now how the opportunities to achieve long-term strategic targets can be seized.

List of Consultation Responses:

The ITC is grateful to all those organisations who responded to our industry consultation and provided insights and data. These consultees included:

Arup Group

British Land

Connected Places Catapult

Department for Transport

DSDHA

National Highways

Network Rail

Stagecoach Group

Stantec

Sustrans

Transport for London

Disclaimer:

This report has been published by the Independent Transport Commission (ITC) to help inform the public policy debate, and should be used only in that context. Whilst every effort has been made to ensure the accuracy of the material presented, the ITC does not accept liability for loss or damage that might in any way whatsoever arise from the use of the data and text contained herein. Note that the evidence and analysis presented in this report has been chosen by the report authors and should not necessarily be taken to represent the collective view of the ITC.



Author Profiles

Sarah Kendall is a transport professional with significant experience in operational delivery and strategic roles, primarily in the rail sector. She has worked internationally in Europe and North America and regularly advises client organisations and governments on transport services and infrastructure. Sarah is a Fellow of the Institution of Railway Operators (FIRO) and a Fellow of the Institution of Civil Engineers (FICE) and a Trustee of the Independent Transport Commission (ITC)

Matthew Niblett is Director of the Independent Transport Commission (ITC) and a Fellow of the Royal Society of Arts. He oversees the ITC's research portfolio and has presented findings from this research to Ministers and Parliamentary Select Committee enquiries. Matthew holds a doctorate from the University of Oxford and was a Senior Research Associate at Oxford's Transport Studies Unit. He is the co-editor of *Why Travel? Understanding our need to move and how it shapes our lives* (Bristol University Press, 2021).

Independent Transport Commission

September 2021

For further information and electronic copies please visit:

www.theitc.org.uk

or write to:

contact@theitc.org.uk





INDEPENDENT
TRANSPORT
COMMISSION

Published by the Independent Transport Commission

The **Independent Transport Commission (ITC)** is one of Britain's leading research charities with a mission to explore all aspects of transport and land use policy. Through our independent research work and educational events we aim to improve and better inform public policy making. For more information on our current research and activities please see our website: www.theitc.org.uk

Independent Transport Commission
70 Cowcross Street
London
EC1M 6EJ

Tel No: **0207 253 5510**
www.theitc.org.uk

Registered Charity No. 1080134
September 2021 © Copyright Independent Transport Commission

£15.00