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ADEPT Last Mile Mobility

# Covid-19 Impacts on Local Transport

**ADEPT** **LIVELABS**  
Transforming Local Places



**CATAPULT**  
Connected Places



# Executive Summary

The UK government responded to the Covid-19 pandemic by putting in drastic measures to prevent the spread of the virus. These measures caused significant disruption to the movement of goods and people and local authorities had to act quickly to ensure the continuation of essential services.

Four key lockdown restrictions which led to disruption of the transport network were:

- 1. Restricted human contact**
- 2. Restricted travel**
- 3. Restricted services and commerce**
- 4. Changes to public safety perception**

These restrictions resulted in new challenges and opportunities for local authorities, which are presented in the table below.

Challenges	Opportunities
<ul style="list-style-type: none"> <li>• Digital transition</li> <li>• Social distancing measures</li> <li>• Continuing essential services</li> <li>• Changes to consumer behaviour</li> <li>• Protection of key workers and vulnerable people</li> </ul>	<ul style="list-style-type: none"> <li>• Modal shift towards active travel</li> <li>• Accelerated legislative changes and trials</li> <li>• Temporary land use reallocation</li> <li>• Reduced road traffic</li> </ul>

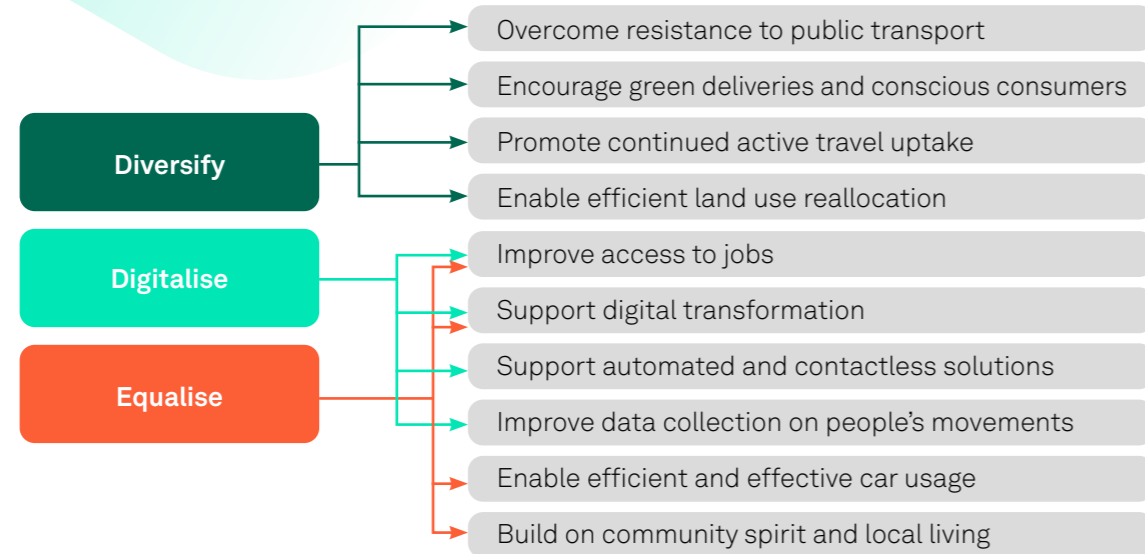


The challenges faced in Buckinghamshire were also experienced nationally and globally. Best practice initiatives to combat the challenges include introducing capacity monitoring on buses to aid social distancing and deployment of autonomous delivery vehicles to reduce human contact and meet the increased demand for home deliveries of essential and non-essential items. The record of best practice responses can be drawn upon in the event of a very similar pandemic.

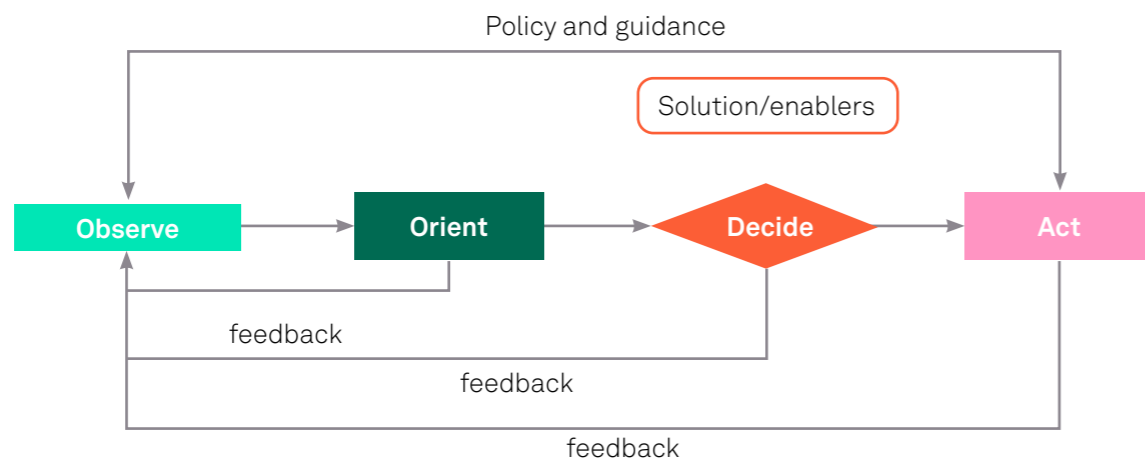
While the long-term impacts of the Covid-19 restrictions and the changes in human behaviour remain unknown, we predict that the following trends will remain:

- Reduced trust in the reliability of public transport services
- Accelerated digital transformation
- Increased online shopping and home deliveries
- Job losses in some sectors and reskilling required
- Increased car usage
- Fear of public transport due to perceived health risks

To address these anticipated trends and to ensure greater resilience to future disruptions, ten recommendations were made. Each recommendation strengthens one of the following resilience pillars: diversification, digitalisation and equalisation as mapped in the figure below.



In the event of another major disruptions the Observe, Orient, Decide, Act (OODA) loop framework can be used to make fast and effective decisions.



Based on John Boyd's OODA loop

To achieve positive outcomes from all the recommendations, there are a range of solutions which could be implemented - each with their own merits. A table of potential solutions is provided in **Section 6** which can be fed into the OODA loop (above) for an assessment of their effectiveness.

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# 1 Introduction

## 1.1

The Covid-19 pandemic restricted the way we live our lives. Social distancing guidelines and ‘work from home’ mandates changed both the purpose and modal choice of conducting journeys.

This report outlines the lessons learnt by local transport authorities during the covid-19 lockdowns in the UK and the steps taken to address the immediate (short-term) impacts from the imposed restrictions. It then presents the expected long-term impacts arising from Covid-19 lockdown restrictions and makes recommendations on how to overcome the residual challenges. The recommendations aim to build greater resilience to future pandemics and other potential disruptions.

## 1.1

### Background

Buckinghamshire Council is leading the delivery of the £4.5m ‘SMART Connected Community: Live Labs’ project which is part of a £23m program, funded by the Department for Transport, and led by the Association of Directors of Environment, Economy, Planning and Transport (ADEPT). The project is built around four themes: Smart Materials, Smart Communication, Smart Energy, and Smart Mobility. This report conducted by the Connected Places Catapult (CPC) extends previous work within the Smart Mobility theme.

From a local authority perspective, the pandemic has resulted in many changes to the required services and the way they are delivered including transport related services. This report investigates the transport technology and operational solutions that could be introduced to support the Council and similar authorities in delivering its transport services during current and future pandemics.

## 1.2

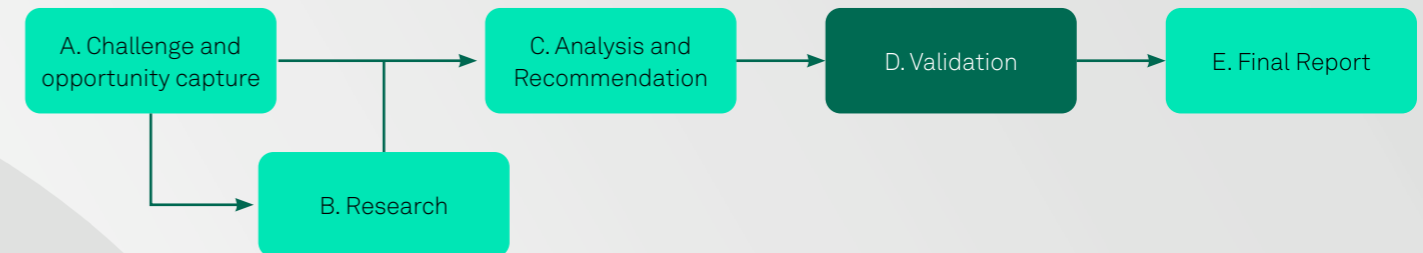
### Methodology

The main objectives of the project were to:

- Understand the challenges caused by COVID-19 in relation to the Council transport operations
- Capture and evaluate potential solutions to the identified challenges
- Define recommendations for the council, and transferable to similar Councils in the UK

**Figure 1** shows the key tasks conducted throughout the project from the initial task of challenge and opportunity capture to final report delivery.

Figure 1: Project methodology



#### Task A: Challenge and Opportunity capture

CPC engaged with Buckinghamshire council through one-to-one interviews to determine the opportunities and challenges caused by COVID-19 from a local authority perspective. The interviews were conducted with officers across a range of departments including public transport, highway management, business support and adult and social care.

#### Task B: Research

Desk-based research was conducted to:

- Identify the responses from other local authorities nationally and whether they experienced similar challenges
- Capture any lessons learnt internationally in relation to the identified challenges
- Identify some potential technological and operational solutions to the captured challenges in Task A

#### Task C: Analysis and Recommendations

By analysing the relevant COVID-19 responses at the local, national and global levels, we made recommendations for Buckinghamshire Council, and similar local authorities, in relation to the identified transport-related pandemic challenges. To aid this task, an internal workshop at CPC was conducted to generate ideas and capture potential solutions.

#### Task D: Validation

A “Check and Challenge” workshop with the interview participants from Part A was used to validate, iterate and prioritise the recommendations.

#### Task E: Final Report

A write up of all the recommendations.

## 1.3

### Report Structure

This report contains six sections, containing the following information:

- **1 Introduction:** introduces the project background, methodology and report structure
- **2 Local response:** outlines the findings based on Buckinghamshire’s experience of the pandemic
- **3 National response:** provides best practice examples of measures introduced across the country to tackle the short-term challenges and opportunities identified in **Section 2**
- **4 Global response:** provides best practice examples of measures introduced globally to overcome the short-term challenges identified in **Section 2**
- **5 Recommendations:** offers a framework for effective decision making, outlines broad recommendations and how they should be prioritised and offers potential technological and operational solutions to achieve the recommendation goal

# 2

## Local Response

The Connected Places Catapult conducted virtual interviews with members of Buckinghamshire council, England's Economic heartland and central Bedfordshire council. The objective of the interviews was to capture:

- Short-term fire-fighting reactions to the initial lockdown announcements
- The methods of rebuilding services
- Differences between national lockdowns 1, 2 and 3
- Predictions of how we will settle towards the new normal

We wanted to understand:

- What worked well and could be repeated
- What could be done differently if a similar situation arises now that there is precedent
- Any opportunities for positive long-term change to processes, services or demand
- Any long-term challenges to processes, services or demands
- Of the challenges identifying which are new and which were underlying but worsened by Covid-19

The findings from the interviews were used to inform the challenges and opportunities explored in the sub-sections below.

### 2.1 During lockdown

The restrictions imposed to combat the spread of Covid-19 resulted in the following contextual changes from Business-As-Usual:

- Restricted human contact
- Restricted travel
- Restricted services and commerce
- Changes to public safety perception

These restrictions created a number of challenges and opportunities across council departments. The key cross-cutting challenges and opportunities we identified are summarised in **Table 1**.

Table 1: Challenges and opportunities during lockdowns

Challenges	Opportunities
<ul style="list-style-type: none"> <li>• Digital transition</li> <li>• Social distancing measures</li> <li>• Continuing essential services</li> <li>• Changes to consumer behaviour</li> <li>• Protection of key workers and vulnerable people</li> </ul>	<ul style="list-style-type: none"> <li>• Modal shift towards active travel</li> <li>• Accelerated legislative changes and trials</li> <li>• Temporary land use reallocation</li> <li>• Reduced road traffic</li> </ul>

A summary of the activities undertaken as an initial response to Covid-19 is shown below. The experience of introducing new measures and taking advantage of time sensitive opportunities should be called upon in the event of another pandemic.

1. Support digital transition
2. Introduce social distancing
3. Identify and continue essential services
4. Support increase in home deliveries
5. Protect key workers and vulnerable people
6. Take advantage of greater propensity for modal shift towards active travel
7. Take advantage of new funding allocations/ faster trial deployment
8. Implement temporary land use reallocation away from cars
9. Take advantage of reduced road traffic (quieter roads)
10. Encourage local living

### 2.1.1 Challenges

#### Digital transition

- An abrupt shift to working from home is only possible once the correct equipment and software is allocated and distributed to staff. This was a significant undertaking for small businesses, those with less investment in digital assets, companies with high security risks and increased usage of remote servers
- IT teams had to adapt to remote working and any hardware replacements risked significant lost time for employers
- Cyber security risks and protection of personal data had to be carefully managed by councils and other organisations

#### Social distancing measures

- Businesses and transport services had to adapt quickly to comply with fast changing regulations regarding social distancing e.g. the 2m rule being replaced with a 1m+ rule and so forth
- Reduced occupancy on buses posed a challenge for popular routes and led to a loss in revenue for bus operators
- Trying to impose and enforce these measures exposed a lack of data regarding real time movement of people. There was no way of digitally assessing whether the occupancy to capacity ratio was sufficiently low to meet social distancing requirements

#### Continuing essential services

- Lack of revenue for public transport services led to reduced services causing problems for key workers to access areas of employment
- Alternative (off-peak) travel times and modes were encouraged
- Loss in revenue from lack of parking in town centres was no compensated by other streams

#### Changes to consumer behaviour

- Big increase in delivery vans to cater for increased demand and reliance on home deliveries for essential and non-essential items
- Increase in on-demand deliveries (such as food) from untrained drivers and illegal use of e-scooters which caused risks to the safety of riders and other road users

#### Protection of key workers and vulnerable people

- Providing transport-enabled services to vulnerable people was challenged by social distancing requirements and capacity limits.
- Ensuring the protection of bus drivers and transport operators while still maintaining essential services



## 2.1.2 Opportunities

### Modal shift to active travel

- There was an initial increase in active travel uptake with a particular increase in leisure cycling
- The widened user base of active travel increases the likelihood for support for (or reduced resistance to) new active travel infrastructure such as bike lanes
- A cultural shift in remote working, leading to better propensity for modal shift

### Accelerated legislative changes and trials

- Possibility to implement urgent infrastructure changes more quickly such as the active travel fund for pop-up cycle lanes
- Legislation to allow e-scooter trials on public roads was accelerated and implemented in Buckinghamshire as a result of the pandemic
- Measures to increase active travel such as lightly-segregated cycle lanes did not require Traffic Regulation Orders (TROs) and could therefore be implemented quickly

### Temporary land use reallocation

- Acceleration of implementing pedestrianisation of town centres and more public support for it
- Café and restaurants were awarded pavement licences and some seating was allowed in former high street parking spaces
- Opportunities for informal land use reallocation, such as children using unoccupied car parks to play sports

### Reduced road traffic

- Quieter roads led to opportunities for road works to be done more quickly and cheaply while causing less disruption.
- Roads felt safer and better air quality led to more people taking up active travel modes
- Better journey time reliability for those travelling and for the movement of goods.
- More parking available for those who require it leading to less time circling for spaces
- Increased perceived value of 'quiet' and environmental impacts leading to increased EV purchases (compared to conventional vehicles)
- Reduced road traffic was a very short-lived opportunity and traffic levels soon rose again as people opted for private cars over public transport



## 2.2 Post-lockdown

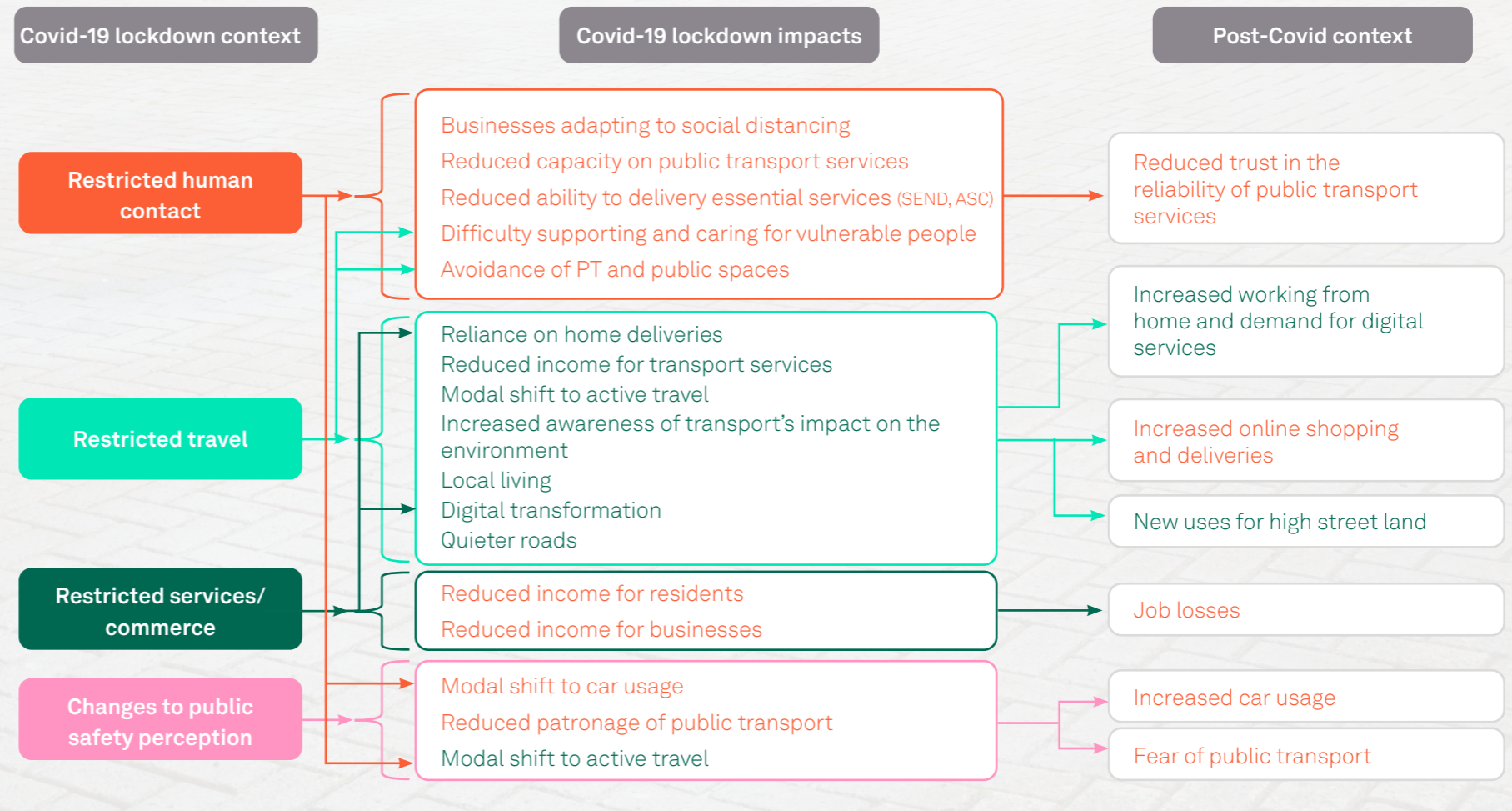
The long-term impacts of the Covid-19 pandemic, once all restrictions are removed remain unknown but we can speculate that there will be:

- Reduced trust in the reliability of public transport services
- Accelerated digital transformation
- Increased online shopping and home deliveries
- Job losses in some sectors and reskilling required
- Increased car usage
- Fear of public transport due to perceived health risks





**Figure 2** maps the restrictions that were put in place to aid the recovery from Covid-19 to the expected long-term impacts, creating a 'post-Covid' context against which interventions can be assessed. In the diagram statements in **orange are challenges**, and the statements in **green are opportunities**.





# 3 National Response

Desktop research was conducted to determine the approaches that local councils and national authorities in the UK took to overcome short-term challenges and enable the short-term opportunities identified in **Section 2**.

Table 2: National short-term challenges and opportunities arising from Covid-19 lockdowns

Challenges	Opportunities
<ul style="list-style-type: none"> <li>• Digital transition</li> <li>• Social distancing measures</li> <li>• Continuing essential services</li> <li>• Changes to consumer behaviour</li> <li>• Protection of key workers and vulnerable people</li> </ul>	<ul style="list-style-type: none"> <li>• Modal shift towards active travel</li> <li>• Accelerated legislative changes and trials</li> <li>• Temporary land use reallocation</li> <li>• Reduced road traffic</li> </ul>

## 3.1

### Overcoming challenges

Below are examples of how some of the short-term challenges were overcome across different local and national authorities in the UK.

#### 3.1.1 Digital transition

Being able to offer the same service to residents during the pandemic has been a huge challenge for local authorities with social distancing measures, work from home mandates, staff redeployments and facilities closing. In addition, new and urgent offerings had to be set up such as helping vulnerable people get access to food and medication and giving grants to businesses who have been forced to close or reduce their services.

**St Albans District Council** developed a fully automated online form which enables small businesses to apply for grant funding during COVID-19 outbreak. This increases the speed and efficiency for both the applicant and the reviewers to accelerate getting the money to those who are eligible<sup>1</sup>.

**Bristol City Council** used a new online platform 'Can Do Bristol' to coordinate a citywide volunteering response to Covid-19. Given the wide access to the platform, the digitalisation of the process helped them to recruit 4,000 volunteers.

#### 3.1.2 Social distancing measures

Social distancing was enforced to reduce the transmission of Covid-19 through human contact. The process of implementing social distancing measures effectively can be greatly aided by a better understanding of where people are, and therefore where should be avoided.

**Newcastle City Council** and partners developed a 'How Busy is Toon' tool focused on the main high street, that provides data to residents to help determine where and when social distancing is possible<sup>2</sup>. The website uses real time information from computer vision cameras which track footfall data from the city centre. The data is updated every five minutes. A red, amber, green system advises residents on how easy it is to social distance at a certain time in the city centre whereby green indicates sufficient space to socially distance, amber suggests that the centre is approaching full capacity and red advises the user to delay their trip until footfall levels have eased. The technology and equipment were originally intended to gather routine footfall data by the University's Urban Observatory for high street data. Since lockdown measures came into practice, they have been reutilised for this COVID-19 purpose to help residents resume normality while staying safe<sup>3</sup>.

**Brent council** along with many others introduced measures to temporarily widen pavements using barriers and signs at locations outside busy premises and bus stops to aid social distancing of pedestrians<sup>4</sup>.

Disseminating the messages dictated by the national and local government is important for greater compliance by residents. To aid this, **Pembrokeshire County Council** developed a range of 'COVID-19 Unlocking Signs', which covered themes of hygiene, social distancing and building flow. The signs form part of a broader campaign to preserve community safety as lockdown measures ease. They are available to download from the website in both Welsh and English in order to reach a broad audience and, in saving businesses from having to produce their own signs, have proven a popular resource for businesses located within the county<sup>5</sup>.

#### 3.1.3 Continuing essential services

The stay at home messages and the introduction of capacity caps on public transport to aid social distancing led to a huge drop in patronage and revenue for public transport services. To maintain services and the industry, and ensure transport for key workers, the government offered financial support for transport operators, with £167 million granted to the Covid-19 Bus Services Support Grant paid over 12 weeks on the basis of distance driven. The grant could be accessed by eligible authorities across the UK.

#### 3.1.4 Increase in home deliveries

A surge in online shopping for essential food items as well as clothing and other non-essentials saw a rise in demand for light goods vehicles (LGVs). Figures from the Society of Motor Manufacturers and Traders (SMMT) showed the van market grew by 22% in contrast to the new car market dropping by 35.5% in registrations<sup>6</sup>. When ordering online, items often have to travel long distances to reach the end consumer rather than being procured from local shops, adding mileage travelled on the roads leading to increased carbon emissions and reducing air quality.

**Virtual high streets** were set up in a number of locations to enable consumers to get products from local businesses delivered to their door on the same day, this aided social distancing and also allowed for journey consolidation of deliveries while supporting the local economy. Click It Local in partnership with **Uttlesford District Council** is an example of one such service for Saffron Walden<sup>7</sup>. It also supports local couriers, taxi firms and cyclists who may otherwise have been out of work.

1 <https://digitaltransform.org.uk/2020/04/covid19-support-solutions/>

2 <https://howbusyistoon.com/>

3 <https://www.local.gov.uk/our-support/coronavirus-information-councils/Covid-19-good-council-practice/Covid-19-council-case>

4 <https://www.brent.gov.uk/services-for-residents/transport-and-streets/making-travel-safer-and-healthier/widening-footpaths/>

5 <https://www.local.gov.uk/our-support/coronavirus-information-councils/Covid-19-good-council-practice/Covid-19-council-case>

6 <https://uk.motor1.com/news/492933/van-market-growth-february-2021/>

7 [https://www.clickitlocal.co.uk/uttlesford/?utm\\_medium=email&utm\\_source=govdelivery](https://www.clickitlocal.co.uk/uttlesford/?utm_medium=email&utm_source=govdelivery)



### 3.1.5 Protecting key workers and vulnerable people

The acute risk to bus drivers was acknowledged after a number of untimely deaths. **Transport for London** initially responded by removing the charge for buses so that there was less contact with drivers. They put in measures to seal off gaps in driver's existing assault screens and required passengers to enter and exit through the rear door. They also introduced reduced capacity limits and the government ensured that face coverings were mandatory for all passengers (unless exempt for medical reasons)<sup>8</sup>. In other districts, cash payments were prohibited and in some cases all charges were removed to ensure this.

Stagecoach partnered with **Nottinghamshire County Council** to trial an app-based demand response bus service for NHS workers of Sherwood Forest Hospitals NHS Trust. The solution ensured that workers did not have to worry about driving home or finding and paying for parking spaces after long shifts. This solution also segregated those most likely to

be exposed to the virus (those treating patients with Covid-19) from the rest of the public, reducing the risk to other public transport users<sup>9</sup>.

**An increased hygiene regime** was required at many transport interchanges, this included introducing hospital-grade cleaning substances which can kill Covid-19 on contact and protect for up to 30 days, increased cleaning of interchanges as well as services such as hire cars and all regular touch point areas such as poles, doors and handrails being treated with disinfectant daily<sup>10</sup>.

**Starship delivery robots in Milton Keynes** delivered food shopping to NHS staff for free during the first lockdown as they did not have time to visit supermarkets when working long hours, especially with reduced capacity in supermarkets leading to long waits to enter stores<sup>11</sup>. The autonomous robots ensured that no human contact was required in the delivery process, reducing the chance for virus transmission.



8 [https://www.intelligenttransport.com/topic\\_hub/Covid-19-transport-news-analysis/](https://www.intelligenttransport.com/topic_hub/Covid-19-transport-news-analysis/)

9 <http://www.passengertransport.co.uk/2020/05/stagecoach-supports-drt-service-for-nhs/>

10 [https://www.intelligenttransport.com/topic\\_hub/Covid-19-transport-news-analysis/](https://www.intelligenttransport.com/topic_hub/Covid-19-transport-news-analysis/)

11 <https://news.sky.com/story/coronavirus-robots-in-milton-keynes-deliver-shopping-to-nhs-workers-11978670>

## 3.2 Unlocking opportunities

Below are examples of how some of the short-term opportunities have been leveraged across the UK.

### 3.2.1 Modal shift to active travel

**Hackney council** issued an **Emergency Transport Plan** in September 2020 which included an essential **cycling support package** offering support for new and returning cyclists and businesses to shift journeys from other modes to bike<sup>12</sup>. The package included:

- Adult cycle training to 900 participants over months, consisting of 600 adults and 300 family and, business groups
- Cycle loan scheme to be offered to 500 Hackney residents. "Try a bike" loan scheme
- Dockless cargo bike rental scheme
- Support package for businesses

**School streets** are areas around schools where motor traffic is restricted at pick-up and drop-off times, during term-time<sup>13</sup>. They were first introduced in Scotland in 2015<sup>14</sup> but during the pandemic, an acceleration of school street initiatives was seen to encourage more walking and cycling to school.

**Lambeth Council's** emergency action plan included **widening pavements** at some of the busiest parts of the borough to provide safe routes for pedestrians and extending bus lane operational hours to provide better experiences for cyclists. The emergency measures are to be followed up with longer term plans which mitigate against rat running once restrictions ease and limit the expected increase in motor vehicle use<sup>15</sup>.

### 3.2.2 Accelerated legislative changes and trials

Amendments were made to the national government's **traffic regulation order (TRO) process** to allow digital advertising of the order in the first instance. Once the order was made, a second notice still needed to be published for information within 14 days preferably via the newspaper but could also be via digital means where that was not reasonably practical<sup>16</sup>. This was designed to enable fast reallocation of road space to active travellers through schemes such as Low Traffic Neighbourhoods, School Streets and additional cycling facilities.

More **Low Traffic Neighbourhoods** have been introduced in many London Boroughs, including Hackney<sup>17</sup>. Measures to reduce traffic include modal filters; closing roads to motor traffic, for example by using planters or large barriers. Often used in residential areas, when designed and delivered well, this can create low-traffic or traffic-free neighbourhoods leading to a more pleasant environment that encourages people to walk and cycle, and improving safety<sup>18</sup>. These initiatives make use of changes to public acceptance of road reallocation to aid social distancing.



12 <https://drive.google.com/file/d/1rzUBV6FAMWwo-HpVUJJdE4XE1DwVgPvf/view>

13 <https://www.gov.uk/government/publications/reallocating-road-space-in-response-to-Covid-19-statutory-guidance-for-local-authorities/traffic-management-act-2004-network-management-in-response-to-Covid-19>

14 <http://schoolstreets.org.uk/where/>

15 <https://beta.lambeth.gov.uk/better-fairer-lambeth/projects/transport-strategy-coronavirus-covid-19-emergency-response>

16 <https://www.gov.uk/government/publications/reallocating-road-space-in-response-to-Covid-19-statutory-guidance-for-local-authorities/traffic-management-act-2004-network-management-in-response-to-Covid-19>

17 <https://hackney.gov.uk/rebuilding-a-greener-hackney>

18 <https://www.gov.uk/government/publications/reallocating-road-space-in-response-to-Covid-19-statutory-guidance-for-local-authorities/traffic-management-act-2004-network-management-in-response-to-Covid-19>



**Drone trials** had been planned between Southampton and the Isle of Wight as part of the DfT's Future Transport Zone funding. However, the delivery of the trials was accelerated to aid the Covid-19 response with medical supplies being transported between hospitals. Maggie Oldham, Chief Executive at Isle of Wight NHS Trust, said:

“Longer term, this work has the potential to significantly improve services for our patients by reducing waiting times for test results and speeding up the transfer of important, possibly life-saving equipment or medication.”<sup>19</sup>”

The **Electric Scooter Trials** and Traffic Signs (Coronavirus) Regulations and General Directions 2020 amended traffic regulations to allow the use of electric scooters (e-scooters) on public roads. This permits for the first time in the UK, on-road trials of e-scooters to begin. Previously, e-scooters had been classed as a motor vehicle and thus not lawfully permitted on public roads or pavements. The government stated that these trials are designed to gather evidence on the use and impact of e-scooters to inform possible future legalisation. The regulations came into force less than a week after they were made. Explaining the urgency, the Department for Transport stated that “urgent action is required to provide immediate additional transport capacity”, which it argued had been severely restricted by the impacts of Covid-19<sup>20</sup>. Milton Keynes were one

of the first towns to deploy rental e-scooters for public use, with a trial period of 12 months testing out three operators concurrently<sup>21</sup>.

**Central Bedfordshire council** have **pedestrianised the High Street** in Leighton Buzzard making Lake Street one-way only for traffic<sup>22</sup>. This is a temporary arrangement designed to support the High Street businesses re-opening and the return of the public to the High Street following the easing of the coronavirus lockdown restrictions. Closing the High Street to traffic will enable people to use all of the space available safely to aid social distancing. Work is to start on removing road markings before introducing additional planters, benches and a parasol to support outdoor dining.

### 3.2.3 Quieter roads

Restricted travel, especially during the first lockdown in March 2020 resulted in a significant reduction in road traffic which led to opportunities for more routine and innovative road works to take place with minimal disruption to traffic flow. The quieter roads also led to informal road reallocation such as children playing in the streets and had knock on impacts of better air quality and better journey time reliability for those who did have to travel by road, including delivery services. Many authorities benefitted from cost savings due to being able to conduct works during the day, which would ordinarily be conducted at night. On the other hand, the quieter roads also saw a rise in average and an increase in speeding offences poses a risk to more vulnerable road users.

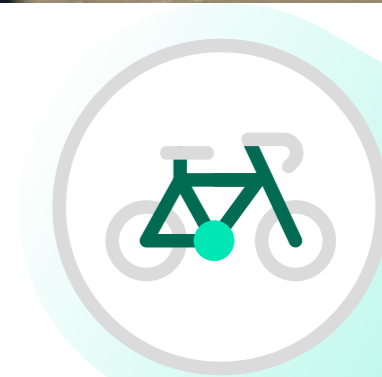


<sup>19</sup> <https://www.southampton.ac.uk/news/2020/05/drone-trial-delivery.page>

<sup>20</sup> <https://lordslibrary.parliament.uk/Covid-19-regulations-electric-scooter-trials/>

<sup>21</sup> <https://www.getsmartertravelmk.org/smart/e-scooter-trials>

<sup>22</sup> [https://www.centralbedfordshire.gov.uk/info/55/transport\\_roads\\_and\\_parking/776/pedestrianised\\_leighton\\_buzzard\\_high\\_street](https://www.centralbedfordshire.gov.uk/info/55/transport_roads_and_parking/776/pedestrianised_leighton_buzzard_high_street)





## 4

# Global Response

Examples of how businesses and cities around the world addressed each of the lockdown challenges identified in **Section 2** are provided below.

## 4.1.1 Digital transition

### Remote working at Fujitsu, Tokyo

Many companies, large and small have announced a paradigm shift in office culture after the pandemic. Fujitsu with its global headquarters in Japan and offices around the world announced its global Work Life Shift programme in 2020 which has led to the office space halving and a dedicated shift to working from home and flexible hours. Fujitsu research found that 85% of the C-suite and 71% of employees believe hybrid working will make their organisation more resilient and better equipped to survive economic issues. Their surveys suggest that there is no great appetite for going back to the traditional 5-day office working week, with just 18% stating that they want to return to the office full-time<sup>23</sup>. As part of the transition, office space will be redesigned to work more effectively. The plan includes a flexible system that allows employees to choose the place they want to work, including from home, hub, or satellite offices, depending on the type of work they do<sup>24</sup>.

### Social Distancing Dashboard, Netherlands

Delft University of Technology (TU Delft) in collaboration with the Amsterdam Institute for Advanced Metropolitan Solutions (AMS Institute) have created a Social Distancing Dashboard. The dashboard was created to show residents areas of public space where social distancing measures (set at 1.5m in the Netherlands) can be respected based on pavement widths and more importantly where that is more of a challenge. The dashboard has open access and is available for public use. The mapping of social distancing potential was set up to raise public awareness of the constraints of keeping a social distance in urban areas but also to aid decision making for Covid-19 related interventions in Urban planning<sup>25</sup>. This platform is likely to be expanded to include information about other points of interest with capacity limitations such as supermarkets and other types of data including mobility and occupancy data where available. This dashboard serves as an example of how open data can be used to provide insights on the likelihood of achieving social distancing in public spaces.

## Investing in alternative modes

Cities have started to invest in their urban bicycle infrastructure or have established temporary bicycle lanes. Across Europe, cities such as Barcelona, Berlin, and Paris invested in their urban bike infrastructure to provide an alternative to public transport and allow mobility for essential journeys while adhering to social distancing guidelines. The website [pedbikeinfo.org](https://pedbikeinfo.org) which is maintained by the Pedestrian and Bicycle Information Center offers access to a crowdsourced dataset which tracks worldwide community actions to adapt the public space in response to COVID-19 focusing on cycling and walking. The dataset can be used as a reference for policy makers to share new ways of creating safe spaces which can allow social distancing. For example, the website records that in April 2020, Washington DC and New York City authorities offered free bike hire to key workers to help them get to and from work safely<sup>26</sup>.

## 4.1.2 Continuing essential services

### Real time journey information, Nevada USA

The Regional Transportation Commission of Southern Nevada (RTC) partnered with Transit to provide passengers with real-time crowd information directly via a journey planning app. The existing mobility as a service (MaaS) application has been upgraded so that when users tap their route line in the Transit app, they can access current crowding levels on approaching vehicles listed as 'many seats', 'some seats' or 'very limited seats'<sup>27</sup>.

### Bus occupancy data, Suzhou China

Chinese cities have adopted data-driven tracking and scheduling systems. The city

of Suzhou, piloted WRI's Transit Metropolis Project, a smart transit platform which can analyse crowd distribution inside buses in near-real time and identify the volume of passengers in each vehicle through smart transit cards. The vehicle occupancy information was made available to the public during the Covid-19 outbreak to encourage the staggering of travel times and now the information is vital to monitoring the return to public transport and can be used to measure the effectiveness of interventions to get people back on public transport<sup>28</sup>.

## 4.1.3 Changes to consumer behaviour

### Autonomous deliveries, Los Angeles USA

Technology startup Pony.ai partnered with e-commerce platform Yamibuy to launch an autonomous delivery service to customers in California during the Covid-19 pandemic. Hyundai Konas vehicles retrofitted with autonomous technology were used to transport up to 100 orders a day to customers' homes<sup>29</sup>.

## 4.1.4 Protection of key workers and vulnerable people

### Demand Responsive Transit, Beijing China

Beijing Public Transport Group complemented their fixed route bus services with on-demand shuttles or demand responsive transport (DRT) to help essential workers reach their place of employment. In total they opened 173 customised routes based on a massive survey among companies and the general public to understand demand. The system works using mobile phone apps whereby once a threshold for demand is passed, a route is created with reserved seating for all interested passengers<sup>30</sup>.

<sup>26</sup> [https://www.pedbikeinfo.org/resources/resources\\_details.cfm?id=5209](https://www.pedbikeinfo.org/resources/resources_details.cfm?id=5209)

<sup>27</sup> <https://www.intelligenttransport.com/transport-news/113334/rtc-crowd-info/>

<sup>28</sup> <https://thecityfix.com/blog/3-ways-chinas-transport-sector-working-recover-Covid-19-lockdowns/>

<sup>29</sup> <https://venturebeat.com/2020/04/16/pony-ai-partners-with-yamibuy-to-autonomously-deliver-goods-to-irvine-customers/>

<sup>30</sup> <https://thecityfix.com/blog/3-ways-chinas-transport-sector-working-recover-Covid-19-lockdowns/>

<sup>23</sup> <https://www.fujitsu.com/uk/news/pr/2021/fs-20210413.html>

<sup>24</sup> <https://www.fujitsu.com/global/about/resources/news/press-releases/2020/0706-01.html>

<sup>25</sup> <https://data.europa.eu/en/impact-studies/Covid-19/social-distancing-public-transportation-systems-european-cities-and>



# 5

## Recommendations

This section provides recommendations on how to:

- make fast and effective decisions during a period of major disruption
- overcome the expected long-term challenges posed by the Covid-19 pandemic
- take advantage of the new opportunities for change which have arisen
- increase the overall resilience of local transport systems

### Decision making

John Boyd's OODA loop (Figure 3) offers a framework for decision making when in a period of significant disruption. It was established in the military to make effective decisions under pressure by utilising as much information as is available. The core principle is that faster isn't always better but taking to time to assess surroundings and understand all available options can lead to better outcomes<sup>31</sup>.

The key components of the framework are:

- **Observe** - capture as much real time data as possible
- **Orient** - apply situational awareness and compare observations to previous experiences
- **Decide** - assess the available options
- **Act** - implement a solution
- **Solutions/enablers** - the intervention options available
- **Feedback loops** - included at all stages to encourage reassessment and recalibration towards the end goal, whenever new information is available

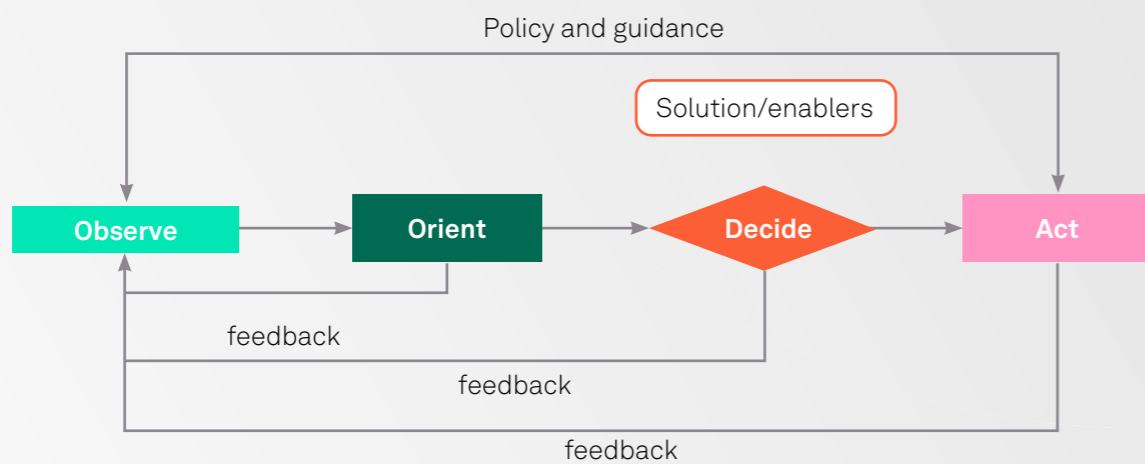


Figure 3: OODA loop<sup>32</sup>

Based on John Boyd's OODA loop

# 5.1

## 5.2 Resilience

Capturing lessons learnt is an essential step to being better prepared to respond to similar events and being able to have a restorative impact more quickly and effectively. However, future disruptions to the transport system are likely to differ from the Covid-19 pandemic and therefore building more general resilience is of greater value.

We have identified three key pillars to improve the resilience of local authorities' ability to provide essential services in times of difficulty. They are to: diversify, digitalise and equalise and are explored in **Table 3**.

Table 3: Resilience pillars

	Diversify	Digitalise	Equalise
<b>Definition</b>	Increase the range of assets and services and/or expand the use cases for the available assets	Convert physical assets to digital assets and introduce processes which enable the use of digital assets and services	Ensure that there is access to the right services for the right people at the right time. Provide equal opportunities to all demographics
<b>Importance to resilience</b>	More options to fall back on and more efficient use of assets	Better access to quality data and clearer predictions on impacts of potential interventions	Ensure that all demographics have the same opportunities to recover from the disruption
<b>Examples</b>	<ul style="list-style-type: none"> <li>• E-scooter roll out to offer new modal choice</li> <li>• Taxis repurposed for goods deliveries</li> <li>• Staff redeployed to emergency response areas</li> <li>• Flexible use of assets such as churches and mosques becoming vaccination centres</li> </ul>	<ul style="list-style-type: none"> <li>• Introducing video conferencing tools for remote working</li> <li>• Offering digital consultations for doctors' appointments</li> <li>• Transferring physical forms to online applications</li> <li>• Moving from cheques and cash to online payments</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible working hours to accommodate those with caring responsibilities</li> <li>• Priority seating on public transport for elderly populations</li> <li>• Priority parking close to amenities for disabled users</li> <li>• Ensuring universal access to internet</li> </ul>

By applying these pillars to the OODA loop, greater resilience can be achieved.

- **Diversification** of data sources is key to being able to observe what is happening and orient within the conditions
- **Digitalisation** improves the ease of accessing current and past data which aids observation and orientation and critically helps to monitor the feedback loops quickly and accurately
- **Equalisation** is an outcome which should be monitored within the feedback loops once a solution has been decided and acted on. Multiple iterations are likely to be required to ensure that access to the solution is available to all who need it

31 <https://thestrategybridge.org/the-bridge/2020/3/17/the-ooda-loop-and-the-half-beat>

32 [https://en.wikipedia.org/wiki/OODA\\_loop](https://en.wikipedia.org/wiki/OODA_loop)



## 5.3 Recommendations

Building on the diversify, digitalise and equalise pillars and the OODA loop resilience framework, we have identified ten recommendations to 'build back better' shown in **Figure 4**. The recommendations build mostly on existing local authority objectives to reduce carbon emissions and provide a more holistic and accessible transport system, however the barriers and opportunities to implementing them have changed as a result of the pandemic.

Figure 4: Recommendations for building resilience



An outline description of each recommendation is provided below:

### Enable efficient and effective car usage

Moving away from reliance on cars for all journeys but ensuring there are sufficient facilities in place for journeys that do require a car. This includes giving car access to disabled users where the general public may be restricted.

### Encourage green deliveries and conscious consumers

Combating the negative impacts of increased home deliveries through greener methods of delivery including goods consolidation (reducing journeys), shopping local (reducing miles travelled) and electrification or shift to active modes (reducing emissions).

### Overcome resistance to public transport

Overcoming the fear of using public transport after social distancing measures have eased by improving and demonstrating the safety of vehicles and developing the offering to increase convenience for users. There needs to be a push to not only get previous users back on public transport and avoid modal shift to the car, but also to encourage new users.

### Improve access to jobs

Harness the remote working model to ensure more people across all demographics have access to good jobs despite transport restrictions and ensure that the transport system is still fit for purpose despite the changing job market.

### Support digital transformation

Continue to offer digital services to residents which complement in person meetings/visits and physical documentation. This also requires ensuring internet access to all residents who wish to have it.

### Implement automated and contactless solutions

Restrictions on human contact were at the heart of the lockdown response, by making use of automated ticketing machines, contactless payments or autonomous deliveries the transport system becomes more resilient if a lockdown were repeated.

### Build on community spirit and local living

The unprecedented restrictions experienced by the UK and global populations has led, in some cases, to a heightened sense of community and an exploration of the local area. This is most prominent in former commuter towns whereby people have suddenly had to adapt to using local amenities. Using this increased awareness and interest in the local environment could be key to long-term behaviour change and modal shift.

### Promote continued active travel uptake

While many people took to walking and cycling as leisure activities during lockdowns, a rise in active travel for commutes has not seen the same attention. Providing new infrastructure and support for those willing to try active travel for the first time for trips to school or work is to be encouraged wherever possible.

### Enable efficient land use reallocation

Temporary land use reallocation has been prominent during lockdowns, both officially through new pavement café licenses or carparks being used for testing and vaccination centres and unofficially such children reclaiming the streets for playing sports. Understanding how land could be used to better serve residents and aid modal shift is essential for building back a more resilient transport ecosystem.

### Improve data collection on the movement of people (for transport purposes)

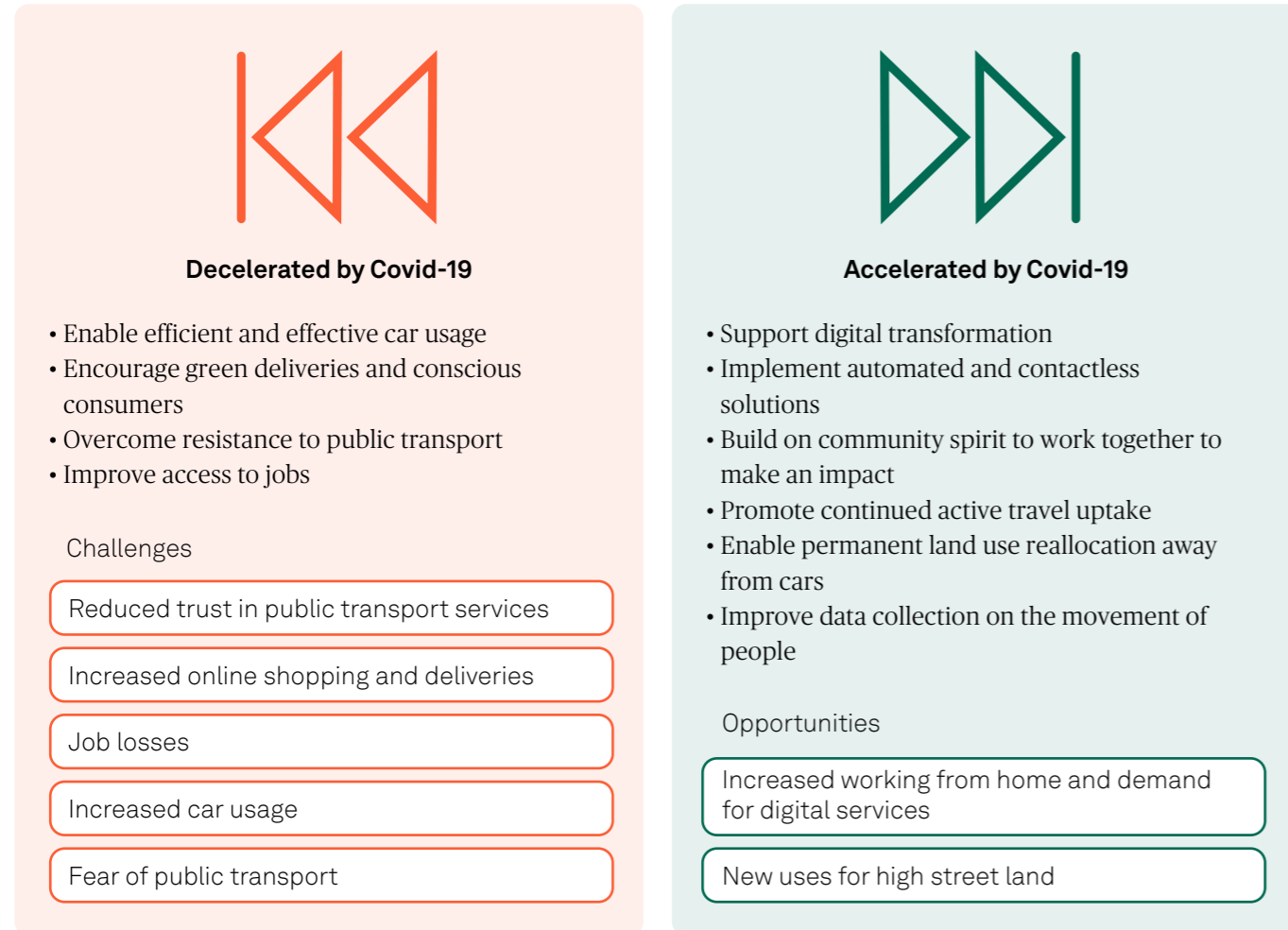
Having access to real time data on capacity and occupancy of transport services and public spaces would clearly aid monitoring of social distancing. More than this, capturing individuals' movements would help to understand where there is demand for new services and connections rather than relying on monitoring data of vehicles whose routes are often fixed.





**Figure 5** splits the recommendations into those which have experienced new challenges as a result of the pandemic and therefore their implementation has been decelerated, and those which have experienced new enablers and have the potential to be accelerated by Covid-19. Those which have been decelerated will require increased efforts to achieve positive change and those which have the potential to be accelerated could be prioritised to take advantage of current opportunities.

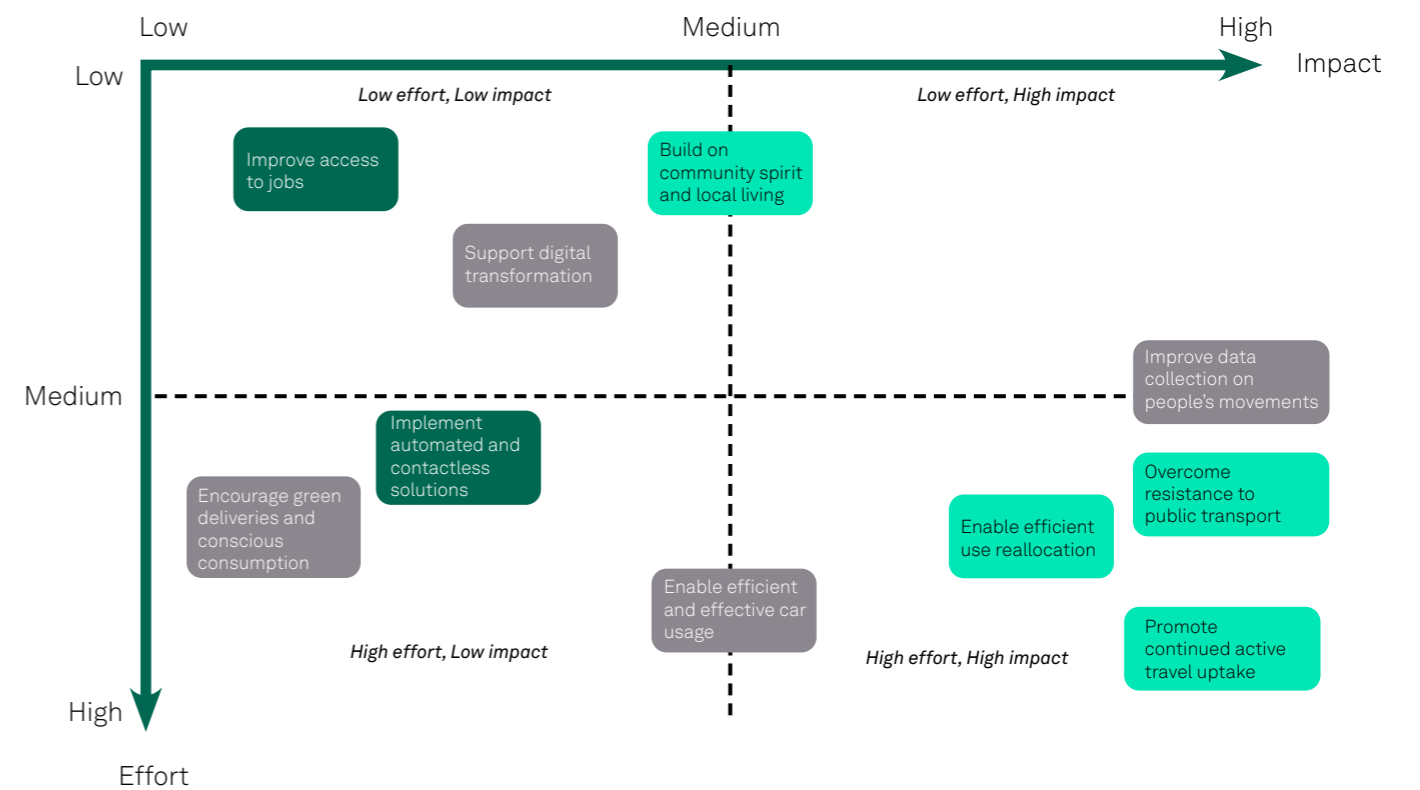
Figure 5: Deceleration and acceleration impacts of Covid-19 on recommendations



## 5.4 Prioritisation

During our check and challenge workshop with members of Buckinghamshire council, we assessed the effort and impact of implementing these ten recommendations. **Figure 6** displays the impact versus effort analysis with an assessment of whether they should be implemented now (within the next year), next (within 2 years) or later (after 2 years). The analysis reflects local conditions as developed by Bucks, and we would propose that others took this framework and developed this as a roadmap to reflect their local conditions.

Figure 6: Impact versus effort analysis of recommendations



Key	
	Do now (within a year)
	Do next (within 2 years)
	Do later (after 2 years)





## 5.5 Potential solutions

**Table 4** outlines examples of potential solutions which will help to achieve of the ten recommendations. This is not a comprehensive list but a guide to some best practice examples.

Table 4: Potential solutions

Recommendation	Impact	Effort	Potential enablers	Example link (where available)
<b>Enable efficient and effective car usage</b>	Medium	High	<b>Digital travel cards</b> to give special parking or driving access to targeted user groups. Similar to the national key scheme (NKS) which offers disabled people independent access to locked public toilets around the UK - cards or keys could give access to areas where cars are otherwise restricted.	<a href="#">National key scheme</a>
			<b>Parking sensors</b> to provide drivers and parking enforcement officers with real time information regarding parking restrictions and occupancy of spaces. These can be set to only allow blue badge holders of electric vehicle drivers to park in certain spaces.	<a href="#">Appy Way</a>
			Roll out of <b>public electric vehicle charging infrastructure</b> to enable the transition to zero tailpipe emission vehicles.	
<b>Encourage green deliveries and conscious consumption</b>	Low	Medium	<b>Virtual high streets</b> are an online platform which are a single point of access to a variety of independent local businesses, offering an alternative means of selling goods to physical shops.	<a href="#">Sudbury virtual high street</a>
			Local business <b>delivery consolidation</b> initiatives which combine purchases from multiple shops or market stalls into one order and deliver them all together to reduce the number of deliveries to the same address. By combining this initiative with greener modes of delivery such as cargobikes, significant reductions in carbon emissions can be achieved.	<a href="#">Princes Risborough Baskets</a>
			Accelerate <b>transition from diesel to electric vans</b> to reduce the negative environmental impacts of increased van uptake.	
<b>Overcome resistance to public transport</b>	High	High	<b>Marketing campaigns</b> to promote the safety of using public transport and the importance of shared mobility in the fight against climate change.	
			<b>Flexible ticketing</b> which do not tie people into weekly or season passes but offer discounts for buying journeys in bulk (such as carnet ticketing) and redeeming over a longer time period as required by the user. This ensures that public transport remains affordable per trip as the hybrid home and office working model becomes more popular.	
			Upgraded <b>ventilation systems</b> on buses to reduce the risk of transmitted airborne diseases and protect both transport operators and passengers.	<a href="#">Grayson Thermal Systems on London Buses</a>
			<b>Modernise and electrify bus fleet</b> to make more them more comfortable and desirable modes of transport. Reducing tailpipe emissions from bus fleets also aids greater uptake of active travel as local air quality Improves and sets a precedent for electrification.	
<b>Improve access to jobs</b>	Low	Low	<b>Demand Responsive Transport</b> for rural areas which have not had traditionally profitable or well serviced bus routes.	<a href="#">Arriva DRT</a>
			<b>Co-working spaces</b> in towns to attract people into urban centres to spend money in local shops and businesses. Co-working spaces provide an alternative to working from home which has optimal working conditions (quiet, fast wi-fi, meeting rooms) and yet is still local, reducing commuting distance.	<a href="#">Workspace co-working offices</a>
			<b>Provide tools and training for home working</b> such as video conferencing software Zoom and Microsoft Teams for those without access. This includes improving access to the necessary hardware such as laptops and computers through rental or public access (libraries etc).	
<b>Support digital transformation</b>	Low	Medium	<b>Digital information display boards offering real time data on.</b>	<a href="#">Smart city displays</a>
			Ensuring <b>universal internet access</b> in an increasingly digital world so that access to information is equal across demographics. This could be done through subsidising plans.	
<b>Implement automated and contactless solutions</b>	Low	Medium	<b>Repurpose office space</b> to make it more suitable for collaborative exercises (meetings, workshops etc) rather than individual desk working. Including showers and changing facilities along with secure bike storage is also important as people shift commuting modes to cycling.	<a href="#">New workplace options</a>
			<b>Automated delivery solutions</b> such as delivery robots remove human contact from on-demand small goods deliveries but can also provide cost and carbon savings by reducing labour costs and electrified motors with no tailpipe emissions.	<a href="#">Starship delivery robots</a>
			<b>Self-service ticket machines</b> to remove labour requirements and limit face to face human contact.	<a href="#">Meridian digital kiosks</a>
			<b>Contactless payments</b> on public transport modes at point of ticket purchase to speed up the boarding process.	<a href="#">First bus</a>



Recommendation	Impact	Effort	Potential enablers	Example link (where available)
<b>Build on community spirit and local living</b>	Medium	Low	<b>Local competitions</b> to encourage communities to work together to solve environmental problems such as reaching a goal of number of steps taken, or litter picking.	
			<b>Create culture, heritage and leisure trails</b> to encourage people to explore their local area (via active travel means), avoiding long journeys to access green spaces and encourage a healthy lifestyle. This will also increase the interest in developments in the local area as an active participant in the community.	<a href="#">Aylesbury Garden Way</a>
			<b>Apps to do good deeds</b> and small favours for neighbours which can lead to journey consolidation (one household shopping for two) and improve access to goods and services.	<a href="#">Nextdoor</a>
<b>Promote continued active travel uptake</b>	High	High	<b>Cycle hire schemes</b> to offer a trial period for residents to give cycling a go before investing in a new bike themselves. This offers a highly affordable alternative to bike ownership and can include guaranteed maintenance and upkeep in the hire fee.	<a href="#">Islington 'Try before you bike'</a>
			<b>Continued investment in infrastructure</b> which prioritised active travellers for a safer and more convenient experience. This includes giving right of way for cycle paths and segregated cycle lanes away from motorised traffic.	<a href="#">Mini Holland</a>
			<b>Gamification</b> of active travel to incentivise making journeys by sustainable modes through offering rewards.	<a href="#">BetterPoints application</a>
			<b>Prioritisation of active travellers</b> such as priority pedestrian crossings which are programmed to show a continuous 'green person' (walk) signal until traffic approaches, making it easier for people to cross the road.	<a href="#">Green Person Authority technology</a>
<b>Enable efficient land use reallocation</b>	High	High	Reallocating land around schools away from parking spaces to enable safe pick up and drop off using active travel modes.	<a href="#">School streets</a>
			<b>Low Traffic Neighbourhoods</b> to make urban and residential areas more attractive and safer to pedestrians, cyclists and micromobility users leading to safer, cleaner and more desirable places to live and work.	<a href="#">London Living Streets</a>
			<b>Digital kerbside management systems</b> so that car and delivery drivers can understand dynamic changes to kerbside restrictions including loading bays and potentially book a space in advance. This manages to flow of traffic better and aids enforcement of and adherence to parking regulations.	<a href="#">Appy Way traffic mapper</a>
<b>Improve data collection on the movement of people</b>	High	Medium	<b>Occupancy monitoring systems</b> can detect in real time the number of people in a given area and match it to the desired or maximum capacity of a vehicle, building or space. This informs decision makers on what action to take with regards to in and outflow of people. Warnings can be issued to incentive people to take alternative routes or travel at different times to avoid unmanageable peaks in occupancy numbers.	<a href="#">Occupancy Now Newcastle's How Busy is Toon</a>
			<b>Micro mobility sensors</b> such as those on e-scooters can track the origin, destination and routing information of individuals. This helps to understand the demand along certain routes which can be used to prioritise services and predict where modal shifts towards sustainable modes is more likely.	<a href="#">Luna systems</a>
			<b>Mobility as a service (MaaS)</b> applications offer the user with a platform more multi-modal journey planning and ticket purchasing but the data from tracking those journeys can be used to predict demand and understand trends in travel data. As travel patterns change this will be an important part of monitoring the new normal and the new transport requirements.	<a href="#">Mobbileo app</a>



# 6

## Conclusion

To 'build back better' and aid the resilience of local transport systems against future pandemics and other major disruptions, local authorities should aim to diversify and digitalise assets and equalise access to services.

Ten recommendations are laid out in this document and should be prioritised based on the categorisation in **Table 5** (although discretion should be used when applying this to authorities other than Buckinghamshire).

Table 5: Recommendation prioritisation table

Do now (within a year)	Do next (within 2 years)	Do later (2 years onwards)
<ul style="list-style-type: none"> <li>• Digital transition</li> <li>• Enable efficient use reallocation</li> <li>• Overcome resistance to public transport</li> <li>• Promote continued active travel uptake</li> <li>• Build on community spirit and local living</li> </ul>	<ul style="list-style-type: none"> <li>• Support digital transformation</li> <li>• Encourage green deliveries and conscious consumption</li> <li>• Enable efficient and effective car usage</li> <li>• Improve data collection on the movement of people</li> </ul>	<ul style="list-style-type: none"> <li>• Improve access to jobs</li> <li>• Implement automated and contactless solutions</li> </ul>

Potential technological and operational solutions have been presented in this report which can be assessed using the Orient, Observe, Decide, Act (OODA) loop for their effectiveness in tackling the challenges at the time of implementation. Local authorities should use the recommendation headings as a starting point for further idea generation of potential solutions and enablers to further accelerate progress following the ease of Covid-19 restrictions.





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