WMG, University of Warwick – Written evidence (TTS0055)

I am writing to you on behalf of WMG at the University of Warwick to share our reponse to the call for evidence for the inquiry into Public transport in towns and cities.

We welcome the inquiry and the chance to comment. It asks many pertinent questions around the current state and the possible future of public transport, which we are immersed in through various trials and research programmes at the University.

Our comments are provided below in answer to the questions raised. Thank you for the opportunity to provide this input.

Summary

WMG is an academic department at the University of Warwick, working at the cutting edge of research with industrial applications, aiming to decarbonise transport. Public transport use has been disproportionately affected since the pandemic, with the long term affects due to public perceptions of safety and policies to limit the spread of the virus currently unknown. Further, issues related to funding for local transport schemes and local decision making, could lead to a lack of development or implementation of innovative public transport.

However, a combination of policy and technology change could increase the use of public transport, to meet the Government target of half of all journeys in towns and cities to be by active or public means by 2030. Technologies developed for the automotive sector, such as vehicle electrification and hydrogenisation, along development of the required infrastructure, autonomy and lightweighting require further support through both funding and legislative changes to meet the specifities of public transport operation. Underpinning this, a robust method of making impartial local transport decisions leading to a highly interconnected public transport network could elicit significant modal shift.

WMG

WMG is an academic department at the University of Warwick, providing research, education and knowledge transfer in engineering, management, manufacturing and technology. The department is a leading international role model for successful collaboration between academia and the public and private sectors, driving innovation in science, technology and engineering.

Current areas of expertise include automotive engineering, autonomy, energy storage and urban mobility. As part of this, WMG has extensive testing capabilities and experience in mechanical testing of materials and state of the art battery test facilities and resources in wireless charging, autonomy, and powertrain design. It is also developing two innovative technology rail vehicles, one for inner-city applications, and the other for rural/suburban alignments, as

well as a novel on-street light-rail trackform, designed to significantly reduce the costs compared to those of implementing traditional light rail schemes.

Response to the inquiry

The Committee seeks evidence in response to the following questions. It is not necessary to answer all the questions.

> 1. *What are the current and anticipated levels of public transport demand and capacity in towns and cities in England? What influences public transport travel patterns? How does the choice of public transport vary across different demographic groups?*

Influence of public transport type:

Different modes of transport offer varying levels of attractiveness to travellers. For example, light rail is known to elicit a significant modal shift, with 30% of tram users in Nottingham switching from cars, whilst 29% of Metrolink users in Manchester would use a car if the tram was not available.[1] Comparatively, it was found in 2013 that bus rapid transit does not achieve such a shift in transport use, due to an association with more traditional bus-based transport which are not perceived to be as permanent.[2] However, the costs of bus-based systems are lower than for public transportation networks those that use rail-based guidance due to reductions in planning requirements, land usage and technological complexity. A system that combines the lower costs from the automotive sector with the high modal shift potential from the rail sector has the potential to encourage a significant increase in public transport use.

Influence of Covid-19 pandemic:

In an attempt to limit the spread of the Covid-19 virus and its subsequent impact on public health, the Government restricted the movement of people using 'lockdowns', firstly between 23 March and 10 May 2020, then again between 5 November and 2 December 2020 and finally between 6 January and 8 March 2021.[3] This affected all forms of transport. For example, car use, shown in Figure 1, decreased during the periods of national lockdown, however relatively quickly recovered to pre-pandemic levels.

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[1] Urban Transport Group, Light rail: keeping city regions moving during the pandemic -and building back better afterwards, 19 May 2021.
[2] Vuchic VR, Stanger RM, Bruun EC., Bus Rapid Versus Light Rail Transit: Service Quality, Economic, Environmental and Planning Aspects. In*: Ehsani M, Wang FY, Brosch GL., (eds)*, Transportation Technologies for Sustainability. Springer, NY, 2013.
[3] House of Commons Library Briefing, Coronavirus: A history of English lockdown laws, CBP-9086, 22 December 2021.
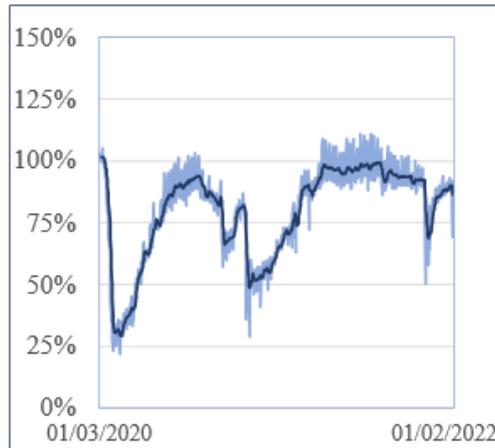
Figure 1: Car use between March 2020 and February 2022. Data source: DfT, Domestic transport use by mode: Great Britain, since 1 March 2020, accessed: 2 March 2022.

Public transport use was also affected; whilst this followed a similar trend as to car usage, as shown in Figure 2, levels did not and still have not recovered to those seen before the pandemic. For example, on 24 February 2022, the day that all legal restrictions were lifted in England, rail usage was at 53% of pre-pandemic levels with tube usage in London at 68%, whilst bus use in London was at 79% and 66% outside London.[4]
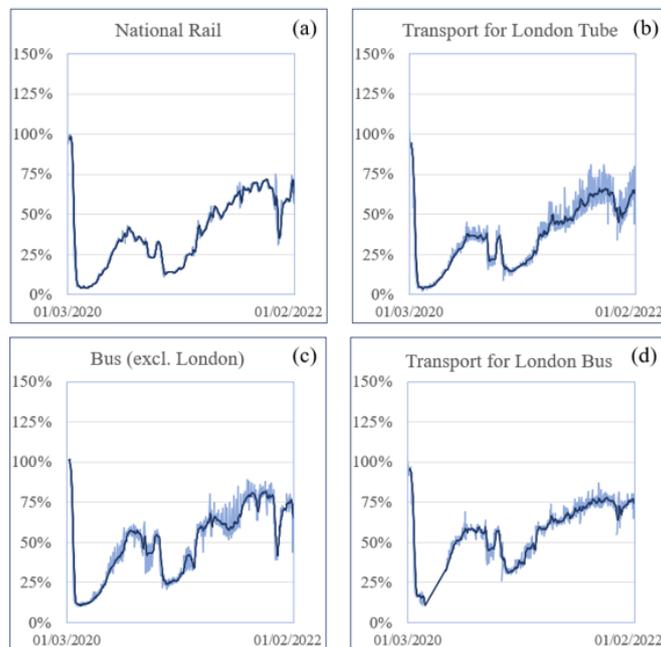

Figure 2: Public transport use between March 2020 and February 2022. Data source: DfT, Domestic transport use by mode: Great Britain, since 1 March 2020, accessed: 28 February 2022.

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[4] DfT, Domestic transport use by mode: Great Britain, since 1 March 2020, accessed: 2 March 2022.

In May 2020, the UK Government released its initial Covid-19 recovery strategy. Whilst those who could not work from home were permitted to return to their place(s) of work, the Government advice at that time was for that public transport should be avoided where possible,[5] supported by advice submitted to the Scientific Advisory Group for Emergencies (SAGE).[6] This advice changed to encourage more widespread use of public transport on 17th July 2020.[7]

It became a legal requirement to wear face masks on public transport on 15th June 2020;[8] this was lifted in July 2021 with expiry of the regulations. The Government did however expect and recommend their wearing in crowded spaces, such as on public transport, although believed that transport operators were best placed to manage their services;[9] as such, TfL kept it as a condition of carriage until 24 February 2022.[10] The mandating of face mask usage is reported to have been a driver in encouraging the return of people to public transport, increasing confidence for users particularly due to high levels (ca. 90%) of compliance.[11]

> *2. How might public transport travel patterns shift in the next 10 years? What impact could digitalisation and the COVID-19 pandemic have on travel patterns in the long term?*

The long-term impacts of the pandemic on public behaviours are not yet fully understood.[12] However, if the patterns observed since 2020 are coupled with a 'green recovery', they could become wide-reaching and permanent.[13] In particular:

- Restricting the spread of the virus using lockdowns led to up to almost half of the adult working population working remotely to some extent, as shown in Figure 3, with levels correlated with restrictions.[14] Many companies have since embraced hybrid working, enabling a combination of working from home and in the workplace, whilst flexible working has also become more common.[15] Whilst a reduction in traffic could lead to an increase in active transport or public transport, it also could increase

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[5] HM Government, Our Plan to Rebuild: The UK Government's COVID-19 recovery strategy, CP 239, May 2020

[6] SAGE, EMG: Evidence for transmission of SARS-CoV-2 on ground public transport and potential effectiveness of mitigation measures, 18 May 2020

[7] Prime Minster's Office, Prime Minister's statement on coronavirus (COVID-19): 17 July 2020.

[8] HM Government, The Health Protection (Coronavirus, Wearing of Face Coverings on Public Transport) (England) Regulations 2020, 15th June 2020.

[9] Parliamentary Question, UIN 29842, Trains: Protective Clothing, 8 July 2021.

[10] Topham G., Transport for London drops rules on compulsory face masks, *The Guardian*, 23 February 2022.

[11] Ipsos MORI, All change? Travel tracker, Qualitative report, *DfT*, October 2020.

[12] National Infrastructure Commission, Behaviour change and infrastructure beyond Covid-19, May 2021.

[13] Powell A., What will the new post-pandemic normal look like?, The Harvard Gazette, 24 November 2020.

[14] ONS, Homeworking and spending during the coronavirus (COVID-19) pandemic, Great Britain: April 2020 to January 2022, 14 February 2022.

[15] ONS, Homeworking hours, rewards and opportunities in the UK: 2011 to 2020, 19 April 2021.

reliance on personal transport that provides greater feelings of security, particularly when travelling outside of conventional commuting times.

- Public transport is not seen as being as Covid-19 safe as car use.[16] In November 2020, it was suggested that public transport rates would be slow to recover to pre-pandemic levels,[17] with this prediction observed in practice (Figure 2). This is primarily due to public perception, with the spread of Covid-19 due to touching surfaces limited. However, it is not yet known whether the short-term shift to car use will be reversed; policies to encourage the use of alternative means of transport could support this (such as those outlined within 'the Transport Decarbonisation Plan', 'Bus Back Getter', and 'Gear Change').

- Shopping for essentials was the main reason that people travelled during the pandemic, responsible for up to 70% of journeys.[18] However, the value of internet sales significantly increased during the pandemic, shown in Figure 4.[19] This increase in online shopping is likely to lead to some reduction in the reliance on cars, particularly for shorter journeys.

It is also worth noting that levels of cycling increased significantly during the pandemic, as shown in Figure 5, particularly during the first lockdown. Whilst this has since reduced to levels similar to those seen before the pandemic, this could impact long term travel patterns. It demonstrated that cycling is a viable transport option for many, which, coupled with other transport policies, could lead to a shift from car usage. Further, linking public transportation with active transport in urban areas is a key goal of Government policies (e.g. the Transport Decarbonisation Plan, which outlines how the Government aim for 50% of journeys to be via active or public means by 2030), and hence building on the public support could have a subsequent positive impact on public transport use.

Figure 3: Percentage of working adults reporting working from home at some point in the preceding seven days between April 2020 and February 2022. Data source: ONS, Homeworking and spending during the coronavirus (COVID-19) pandemic, Great Britain: April 2020 to January 2022, 14 February 2022.

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[16] Abdullah M, Dias C, Muley D, Shahin M., Exploring the impacts of COVID-19 on travel behavior and mode preferences, Transportation Research Interdisciplinary Perspectives, https://doi.org/10.1016/j.trip.2020.100255, 2020.

[17] Ipsos MORI, All change? Travel tracker: wave 3 report, 20-031233-01, DfT, March 2021.

[18] Transport Focus, Travel during Covid-19: Tracking research – wave 55, 23 July 2021.

[19] ONS, Retail Sales Index internet sales, Table IntValSA (value) and Table Internet (percentage), 18 February 2022.
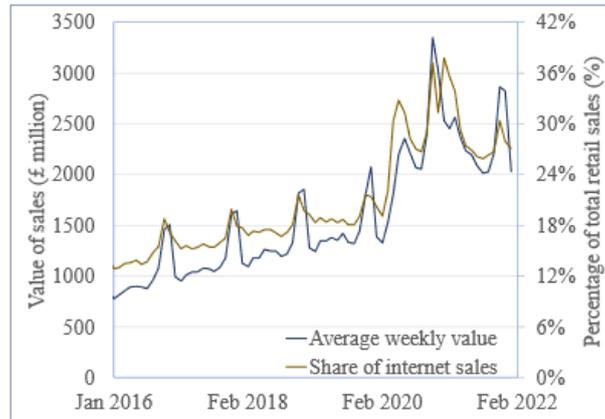
Figure 4: Weekly value (£ million) and percentage of total retail (%) of internet sales between January 2016 and January 2022. Data source:ONS, Retail Sales Index internet sales, Table IntValSA (value) and Table Internet (percentage), 18 February 2022.
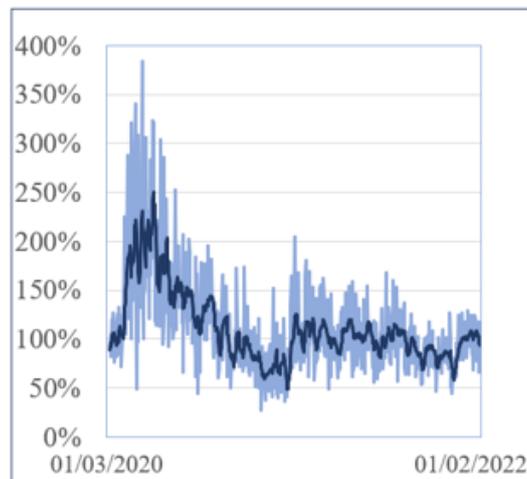

Figure 5: Level of cycling between March 2020 and February 2022. Data source: DfT, Domestic transport use by mode: Great Britain, since 1 March 2020, accessed: 28 February 2022.

In addition to cycling, "Micromobility"[20] has seen huge increases in ridership in many major cities around the world[21] , particularly in younger generations. Whilst this uptake has been slower in the UK due to regulatory limitations, the UK rental scooter trials have demonstrated a similar latent demand. For example, it is estimated that over a million privately owned scooters are in operation around the country despite their use in public areas being illegal[22].

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[20] Micromobility, such as bicycles, scooters, skateboards, and rickshaws, are small, lightweight, human-powered vehicles that typically operate at speeds of up to 25 km/h. Recent developments include the electrification of traditional micromobility (e.g. e-bikes and e-scooters) to increase the attractiveness, with this estimated to increase the market to potentially encompass all trips under 5 miles.

[21] Heineke K., Klosss B., Scurtu D., Weig F., Micromobility's 15,000 mile checkup, McKinsey & Co., 29 January 2019.

[22] Hellen N, Eccles L., One million e-scooters on the roads: how riders are breaking the law at breakneck speed, *The Times*, 12 February 2022.

3. What can be done to improve connectivity across public transport modes? How could better integration be delivered in urban areas outside London?

Public transport could see a greater number of passengers depending on decisions made in national and local government regarding the integration of different modes. Actively coupling public transport with active transport and micromobility, such as allowing human-powered vehicles onto trains and busses, could lead to a transport solution offering a viable end-to-end means of travel over relatively large distances, particularly in urban areas. For example, travellers could combine the convenience and door-to-door service of a scooter for last mile connections with the long-distance comfort of a train, tram, or bus for commuting, leisure or shopping.

It is also worth noting that many workplaces offer car-share schemes. Whilst these are not technically 'public transport' they offer a potential to reduce the number of car users within towns and cities. Further, the advent of connected and autonomous vehicles offers an opportunity for car sharing, where cars are no longer owned by one person, but shared between multiple people and used as and when required. Vehicle use can then be optimised, ensuring that rather than being parked for significant portions of their usable life, they are used as much as possible.

Failure to ensure public transport embraces this multi-modality could instead see cannibalisation of public transport journeys. Instead of taking a train or bus into a dense urban area, people may 'drive and scoot' to maintain convenience, taking passengers away from buses and trains and damaging long-term financial viability for services which are relied upon by many. A robust multi-transport decision making tool that considers the wider impacts could support better integration of public and active transport.

It is not just legalisation, but also product standards which are required too. For example, at the time of preparing this response, e-scooters are banned on the Tube in London due to a spate of fires on the service[23] . Whilst these events are believed to originate from low quality imports, there is no specific standard to pass, and hence the ban is unilateral.

Further to coupling public transport with other modes, integration of specific public transport networks can also improve connectivity. Transport for London (TfL) launched a single payment system in 2003 – the Oyster Card - that could be used across public transport within London, including buses, the London Underground, Tramlink and Docklands Light Railway, London Overground as well as most National Rail services within London, and some river boat services. Since 2014, contactless payments from bank cards have been accepted, with this extended to contactless-enabled mobile devices in 2016.[24] Similar systems have been developed for other cities within the UK. For example, Transport for

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[23] TfL, TfL announces safety ban of e-scooters on transport network, 9 December 2021, accessed: [9 March 2022].

[24] Marcellin F., Cracking open the story of London's Oyster Card, *Railway-Technology,* 3 December 2019.

West Midlands (TfWM) launched the Swift card that can be used as tickets or to pay for journeys on the train, bus or tram, for bike hire, or for parking.[25] The costs can be capped (e.g. at a daily rate) to encourage use across the network, similar to a travelcard.

Integration of these systems between different regions could provide further benefits. For example, a journey could involve travel on TfWM and TfL networks; this would currently lead to two separate charges. A universal 'public transport' cap could therefore lead to increased cross-system usage. However, considerations as to how the income is allocated to the separate operators (e.g. by distance, by cost to operate, etc.) are required.

> 4. What are the likely areas of innovation in urban public transport over the next 10 years? How should public policy be shaped considering both incremental and transformational innovations? How could data help transport services meet consumer demand?

There are a number of technical innovations that are likely to impact urban public transport over the next 10 years:

- Increased electrification, considering technologies on the vehicle as well as for charging infrastructure. Transfer of knowledge from battery development for the automotive sector has the potential to benefit public transport, however this requires alignment with the specificities of public transportation, including differences in range and power requirements, as well as safety protocols and life-time and life-cycle considerations. Thus, data from the automotive sector, as well as for existing electric and diesel public transport vehicles, can be used to support the development of next-generation batteries specifically targeted at public transportation.
- Inductive charging does not require the vehicle to be physically attached to the charging source, however requires alignment and reasonable proximity (ca. 150-300 mm [26]) between the on-board and infrastructure-based components. The fixed routes for many public transport vehicles, such as buses and rail-based systems, offers potential for inductive charging to be used, either statically at specific locations (e.g. at stops, as has been trialled in Milton Keynes [27]) or dynamically along the route. Currently however there are losses in such systems, which could impact overall carbon dioxide emissions; as such, full carbon costing assessments should be undertaken. Such analyses should be consistently undertaken as standard for all innovations to ensure that decarbonisation targets will be met.
- The use of hydrogen as a power source. Having been demonstrated to offer the potential to power rail vehicles, [28]it could offer an alternative to

[25] TfWM, About Swift, accessed: [9 March 2022].
[26] Panchal C, Stegen S, Lu J., Review of static and dynamic wireless electric vehicle charging system, *Engineering Science and Technology, an International Journal*, 21 [5], 922-937, 2018.
[27] CBI, Milton Keynes: Wirelessly charged electric buses, 24 February 2017.
[28] Porterbrook, HydroFLEX, accessed: [8 March 2022].

conventional different types of diesel propelled public transport vehicles. Whilst the technology has also been proven for cars (e.g. the Hyundai Nexo or Toyota Mirai) and buses, [29]considerations regarding the required infrastructure and vehicle certification are still required. [30]

- Increased efficiency through alternative materials. Reducing the weight of vehicles reduces energy requirements, and subsequently operational cost and carbon. Previously, a key barrier has been the cost of lightweight materials with suitable structural performance, however developments in processing as well as in recycling of materials could support transportation in general. Further, the increased operational life of public transport vehicles enables significant reduction in lifetime emissions. For example, considering production, operational and end-of-life phases, the use of carbon fibre in automotive applications leads to a slight increase in lifetime emissions (from that component), whilst conversely almost halves the emissions on a rail vehicle, as shown in Figure 6. Specific examples include:
    o Braiding could enable cost-competitive composite materials to be used as structural components on rail vehicles. [31]A relatively low-cost, low-waste production method, the mechanical performance of structures can also be tailored to suit specific requirements.
    o Composite beams can be impregnated with anti-microbial material, minimising the risk of the spread of pathogens. [32]This also could change cleaning regimens, providing cost-savings to operators.
    o Using polymeric materials for glazing could reduce the mass. Further, such materials are less prone to catastrophic brittle failure, increasing safety for passengers. Recent advances in coating technology overcomes prior limitations to such polymers, such as scratch resistance. This has been demonstrated in both bus and light-rail applications. [33]
    o Joining technologies are key to the use of innovative materials, particularly when considering end-of-life recyclability or reusability. Advanced adhesives in development potentially overcome the drawbacks of traditional mechanical fixation.

- Development of new system level technologies. One particular innovation anticipated to become operational within the next 5 years is Very Light Rail (VLR), for mainline or tram environments.

    o The Revolution VLR has been designed for segregated rural and regional alignments, such as those targeted by the Government's 'Restoring Your Railway' fund. It also provides an opportunity to replace aging rolling stock, such as Class 14X 'Pacers'. Developed as a low-cost, low-carbon vehicle, it combines a diesel-electric

[29] Birmingham City Council, Birmingham gets first hydrogen bus, 27 July 2021.
[30] The ICCT, Developing hydrogen fueling infrastructure for fuel cell vehicles: A status update, October 2017.
[31] Tyrrell M., The right train of thought, *Composites in Manufacturing*, 23 October 2019.
[32] *The Engineer*, Anti-microbial grab poles could make public transport safer, 14 January 2021.
[33] *Glass and Glazing Products*, Crash-resistant glazing for Coventry rail, 17 July 2021.

hybrid powertrain with lightweight materials to minimise operational costs. [34]It could also offer a suitable alternative for inner-city spurs (e.g. Coventry City Centre to Ricoh Arena), or links between towns (e.g. Cirencester to Kemble). The business case for such schemes is dependant on data regarding existing transport links and the ways that people currently travel along those corridors.

- o The Coventry VLR programme will transform light rail, through reducing installation costs to make light rail affordable to a wider range of towns and cities. Through an innovative trackform that minimises the requirement for deep excavation and enables highway engineering technologies, typical costs are anticipated to be reduced from £25-30 million per km to £10 million per km. Coupled with a small, relatively nimble, lightweight vehicle that enables penetration throughout cities, this innovation could expand the potential market for a mode of transport that can elicit a significant modal shift from cars to public transport. [35]

- A major operational cost for public transport operators is that of staff, and in particular drivers. Hence, autonomy could ensure economic viability of existing services, and possibly even enable additional services. The technology is rapidly developing, and has been demonstrated in automotive vehicles and on trams in Europe [36] it is worth noting that whilst the DLR in London is driverless, it is not autonomous. Whilst the technology has been proven, legislative changes are required to facilitate the use of such vehicles, which has a significant number of challenges, including culpability and the impact on insurance.

- Demand responsive service is an emerging facet that encourages the use of public transport for rural applications. [37]It could also benefit urban transport by supporting those who commute outside of traditional hours; in particular this could alleviate concerns with travel late at night. Further, the advent of autonomy reduces the costs associated with this and could ensure operational economic viability. Using data regarding times of anticipated demand (e.g. shift finish times at hospitals or warehouses) could minimise waiting times and increase its use.

[34] Eversholt Rail, Revolution VLR – the future is Very Light Rail, 12 August 2021.

[35] Coventry City Council, Coventry Very Light Rail, accessed: [8th March 2022].

[36] Connolly K., Germany launches world's first autonomous tram in Potsdam, *The Guardian*, 23 September 2018.

[37] Li X, Wang T, Xu W, Li H, Yuan., A novel model and algorithm for designing and eco-oriented demand responsive transit (DRT) system, *Transportation Research Part E: Logistics and Transportation Review*, 157, doi.org/10.1016/j.tre.2021.102556
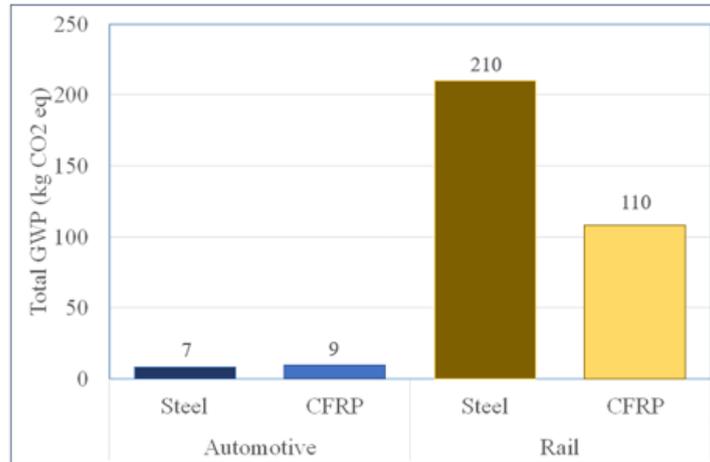
Figure 6: Comparison of the total Global Warming Potential (GWP) (CO2(e)) when using 1 kg of steel or carbon fibre (CFRP) in automotive and rail vehicles.

Implementation of new technologies requires a change in the decision-making processes used early in the project lifecycle. Particularly, development of an innovative methodology to evaluate the long-list options has the potential to incorporate a wider range of both incremental and transformational innovations. This requires analysis of the data that is currently available for available services, knowledge of the opportunities in both existing technologies and those in development, and assessment of potential benefits that these could provide, based on the data that is available for similar services.

> 5. *Are local authorities well equipped with appropriate funding and powers to deliver high-quality public transport services? Would further devolution of transport policy contribute to better outcomes?*

The level of funding and powers for local authorities differs dependent on the scale of local devolution. For example, combined authorities have greater ability to enact change compared to individual councils. [38]As such, whilst it is still challenging for local authorities to drive innovation or good practice, it is possible that increased devolution could provide greater opportunities for delivery of suitable public transport schemes.

It is worth noting that, in their investigation into the failings of major projects, the Public Accounts Committee noted concerns a lack of skilled personnel leading major projects. [39]Devolution could exacerbate this, spreading the existing expertise over a wider range of projects and areas. However the Infrastructure and Projects Authority are aiming to improve the skills base through a

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[38] Department for Communities and Local Government, Single Pot Assurance Framework: National Guidance, April 2016.

[39] Public Accounts Committee, Thirty-Ninth Report - Lessons from major projects and programmes, HC 694, 29 January 2020.

Government Projects Academy that aims to accredit project delivery professionals across the public sector. [40]

The Government have outlined plans to ensure that all areas within the UK have access to opportunities to enhance the locale, through its 'Levelling Up the United Kingdom' white paper. Further, the 'Transport Decarbonisation Plan' outlines how local policymakers are best placed to make transport decisions within their region, using 'place-based solutions' to reform local transport networks.

However, it is also worth noting that the Government's 'Integrated Rail Plan for the North and the Midlands' details proposals for the rail network in the North and Midlands of England, and outlines plans for a mass transit scheme in West Yorkshire. This plan was met with criticism from local leaders, such as the Mayors of Greater Manchester, Liverpool City Region, West Yorkshire, North of Tyne and South Yorkshire, who requested a full assessment against plans proposed by Transport for the North. [41]

6. *Could better policy coordination across government departments, and between central and local government, improve public transport outcomes? If so, how can this be achieved?*

Recently, the DfT and the DLUHC have released policy documents that could impact public transport: the DfT 'Transport Decarbonisation Plan', and supporting transport-mode specific white papers, such as 'Bus Back Better' and 'Gear Change'; and the DLUHC 'Levelling Up the United Kingdom'. Further, HM Treasury are responsible for the 'Green Book', which is a guide for appraising schemes requiring public funds and is the basis for the DfT 'Transport Analysis Guidance' (TAG). Ensuring that the work of the three departments is closely coordinated could benefit public transport; there are similarities in their aims, that ultimately should ensure suitable long-term transport opportunities for all areas of the UK that deliver suitable value for money. The current strategies suggest that this is the case, however maintaining a high level of communication between the departments is key to ensuring that policy shifts from different departments correlate to relevant changes in the others.

Local transport authorities outside London must produce Local Transport Plans every five years under the Transport Act 2000 and amendments via the Local Transport Act 2008, outlining policies and implementation plans. Under the 'Transport Decarbonisation Plan' and the 'Levelling Up' paper, the Government note the importance of local knowledge and plans to use devolution to increase local powers. As such, improved coordination between local and central government may only have a limited impact on public transport. However, improved communication and sharing of knowledge gained from projects between local governments could have benefits. The Government Projects

[40] IPA, Government launches new Projects Academy, 24 March 2021.
[41] Greater Manchester Combined Authority, "Ministers must reassess rail plans for the North of England" – Northern Mayors, 8 February 2022.

Academy could act as a facilitator for this, or as a repository for knowledge that can be used by local governments as required.

> 7. *What are the barriers to improving urban public transport, in terms of delivering the necessary infrastructure, increasing connectivity and improving the consumer experience?*

Combined authorities mostly adopt a single pot approach to funding, with control over how this is spent at the behest of the combined authority. Local schemes meanwhile are funded on an annual basis, limiting private investment and long-term planning whilst focusing attention on short-term, 'shovel-ready' projects. Comparatively, French cities with over 100,000 residents must have 10-year transport plans. Funding in France is then allocated in five-year periods, which incentivises private investment. [42]As there is insufficient funding for public transport innovation, longer term funding arrangements could overcome this barrier. Further, the current that is currently available is primarily used to fund major projects with large consultancies or companies. Specific innovation funds for local transport authorities could help drive positive change.

Further to this, projects to improve the infrastructure for urban public transport can take many years to develop and deliver, and therefore could span different political leadership. This can lead to new personnel who re-evaluate projects. Personal opinions can impact the appraisal process, in terms of the types of appraisals undertaken, and hence such reassessment of the options can cause for projects to change. [43]Obtaining cross-party support is therefore key to developing long-term stability.

One of the key limitations to delivering suitable transport changes is related to the decision-making processes, at both a national and local level. Whilst the processes are defined within local governance documentation (e.g. Local Assurance Frameworks) that aim to minimise the risk of personal bias, the Institute for Government note that there is a lack of transparency coupled with limited understanding of the principles and processes used to generate supportive evidence. [44]

Further, political visions and commitments can lead to decisions being made early in projects before thorough appraisals. Whilst this does not remove the potential for changes to plans, such as in the Integrated Rail Plan compared to initial proposals for HS2, policy decisions that renegue on early promises draw criticism. An impartial decision-support tool that compares a wide range of (e.g. longlist) options towards the outset of a project could overcome this and ensure longevity of projects, even if there are changes to political leadership (e.g. mayoral elections).

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[42] Wilcox Z., Nohravá N., 'How can cities make transport work for them', Ch. 3 in *Delivering change: Making transport work for cities*, Centre for Cities, 2014.

[43] Public Accounts Committee, Thirty-Ninth Report - Lessons from major projects and programmes, HC 694, 29 January 2020.

[44] Institute for Government, How governments use evidence to make transport policy, February 2021.

Information used within decision making is generated using appraisal processes. The DfT defined TAG has been developed specifically for transport schemes; whilst this is not mandatory for schemes not requiring central Government approval, it is recommended for local schemes as well. [45]Meanwhile guided transport schemes require authorisation by the Secretary of State under an Order under the Transport and Works Act. Obtaining such an order is seen as a barrier, particularly for new light rail schemes, as they can require considerable time and funds with no guarantee of success; [46]further they do not necessarily mean the proposal will receive public funding, which is decided on through submission of a Transport Business Case (part of TAG). [47]

   8. *Are there other important changes, not covered elsewhere in these questions, which would improve matters?*

Please feel free to contact me directly regarding any queries you may have. Thank you once again for this opportunity to share our views.

March 2022

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[45] DfT, Transport Analysis Guidance: An Overview of Transport Appraisal, January 2014.
[46] Johnstone S., UK barriers to progress, *Tramways & Urban Transit*, 18 February 2019.
[47] DfT, A TWA Guide to Procedures, July 2006.