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The Future of Transport Data

techUK response to the Transport Select Committee, August 2023

About techUK:

techUK is a membership organisation launched in 2013 to champion the technology sector and prepare and empower the UK for what comes next, delivering a better future for people, society, the economy and the planet. It is the UK's leading technology membership organisation, with more than 1,000 members spread across the UK. We are a network that enables our members to learn from each other and grow in a way which contributes to the country both socially and economically. By working collaboratively with government and others, we provide expert guidance and insight for our members and stakeholders about how to prepare for the future, anticipate change and realise the positive potential of technology in a fast-moving world.

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Executive Summary

techUK, the UK's technology trade body, welcomes the Transport Select Committee's inquiry into the future of transport data.

techUK sees a tremendous opportunity to transform transport into a data-driven industry through delivering on the pledges and actions set out in the Transport Data Strategy (TDS) published in March 2023. This ambitious strategy sets out the opportunities from improving transport through a more sophisticated use of data, alongside the challenges presented and the foundations to overcoming them. **techUK believes that the focus for government should be on delivering the TDS in full, in partnership with industry.** Achieving this requires data being placed at the top of the Department for Transport's agenda, and ensuring it has sufficient resourcing, expertise and support.

techUK and its members also believe that the government has an opportunity to spearhead new approaches to encouraging the greater collection and sharing of transport data, while always taking the necessary precautions to mitigate against any risk this may expose us to. We welcome the positive steps taken by the Department for Transport (DfT) already, such as Open Bus Data and EV charge point regulations, but **we see an opportunity to take this further though innovative data sharing agreements and non-regulatory measures, developed in partnership with the sector.** Defining this new approach will be an iterative process that can be facilitated through a collaborative approach involving government, contracting bodies, academia and industry.

Structure of this evidence

This evidence is structured in three core sections – the opportunity, the risks & challenges and the solutions. We have identified which of the Committee's questions have been broadly addressed within each section. Our approach allows us to focus on the challenges we face as a sector, and wider ecosystem, and to provide actionable recommendations and ideas for addressing them. We hope the Committee will find these recommendations helpful and explores them in further detail throughout this inquiry.

Section one – the data opportunity

Broadly covering questions:

1. *How might planning and delivery of transport infrastructure and services be changed by greater sharing and use of transport data over the medium and long terms?*
2. *How might the travelling public, and local communities, experience the benefits of better use of transport data? What unintended consequences might there be?*
3. *How will it benefit the freight sector and the supply chain?*
4. *What are the potential uses of data for understanding usage and condition of assets like roads, rail track, charging points, vehicles and the kerbside?*

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Improving the use and access to data plays an important role in delivering a more efficient, better integrated, safer and more sustainable transport network. Data is central to both the ability to develop new products and services and support better decision-making through the provision of a rich layer of insights for companies and public bodies.

The Department for Transport's (DfT) Outcome Delivery Plan: 2021 to 2022[1] stated that it had three core objectives (the DfT did not publish an Outcome Delivery Plan: 2022-2023):

1. improve connectivity across the UK and grow the economy by enhancing the transport network on time and on budget;
2. tackle climate change and improve air quality by decarbonising transport;
3. build confidence in the transport network as the country recovers from COVID-19 and improve transport users' experience, ensuring that the network is safe, reliable, and inclusive

High-quality, discoverable and available data is critical to both delivering a programme of projects that meet these ambitions and measuring progress against them. For example, data from remote sensing and connected Internet of Things (IoT) devices can enable a vast number of use-cases capable of making infrastructure intelligent, environmentally efficient and user-centric. When layered with applications such as Digital Twins and Artificial Intelligence, transport is truly revolutionised into a data-driven sector, capable of setting a benchmark for other industries.

techUK and its members are pleased that the government recognises data as the driving force for achieving the UK's status as a science and technology superpower and has taken steps to establish a clear path towards it. For example, the DfT's 'Transport Data Strategy' (TDS)[2] has set out strong foundations for unlocking innovation in the sector through data sharing. It has comprehensively outlined the range of use-cases that exist, from new products and services that benefit customers, to supporting modal shift, and delivering more intelligent infrastructure. The government has also taken steps to improve data sharing by setting out an enabling framework for the introduction of Smart Data Schemes, which will facilitate economy-wide, cross-sector data sharing[3]. To further bolster these efforts, as outlined in techUK's A UK Tech Plan strategy[4], we encourage the government to publish a 'top 5' priority list of areas for Smart Data Schemes. The transport sector could benefit from a Smart Data Schemes, and we encourage the government to investigate the potential use-cases in transport as one of its 5 priority sectors.

[1] https://www.gov.uk/government/publications/department-for-transport-outcome-delivery-plan/dft-outcome-delivery-plan-2021-to-2022#foreword-by-the-secretary-of-state-and-permanent-secretary
[2] https://www.gov.uk/government/publications/transport-data-strategy-innovation-through-data
[3] https://bills.parliament.uk/bills/3430
[4] https://www.techuk.org/resource/a-uk-tech-plan-how-the-next-government-can-use-technology-to-build-a-better-britain.html

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The use of data was estimated to have added at least £241 billion to the UK economy between 2015 and 2020[5]. The financial, environmental and social benefits of increased data sharing are further supported by a large body of published literature. For example, the 2017 report commissioned by the Transport Systems Catapult, using analysis from the Open Data Institute and techUK member Deloitte, stated that by removing the barriers mentioned above this could unlock the full potential of the UK's transport network, providing a value of £14bn by 2025[6]. A report by the think tank the Coalition of Reimagined Mobility (ReMo) from 2022 found that improved data exchange across the freight sector would reduce emissions by 22%, costs by 6% reduction, and pollution in port communities by 40% simply by increasing efficiency[7].

The benefits presented by a better use of data for transport have been the subject of a large volume of research. However, how we actually enable positive change has received comparatively less attention, and especially where government can help drive this forward. Therefore, in our response to the Committee's call for evidence, we have addressed questions 1 to 4 only briefly, and focussed our attention on the challenges created by data and solutions developed in partnership with our members.

Section two – the risks and challenges

Broadly covering questions:

5. *What privacy, ethical, security, resilience and intellectual property issues arise in relation to gathering and sharing transport data, including location-based data about journeys and data with commercial value? How should the Government seek to manage and regulate these?*
6. *What are the biggest gaps in available data about transport networks and travel? What kinds of policy, planning or maintenance questions cannot currently be answered that we could answer with new, or more accessible, data?*
7. *How can the UK scale up from pilots, pockets of innovation and existing single-mode data sets towards an integrated, comprehensive landscape for transport data?*

Data sharing and data-driven initiatives within transport are not without risk or challenge. Gathering, storing and sharing data is not a neutral act. It requires multiple parties to work together to create the correct technical architectures, governance frameworks and risk mitigation strategies. In many cases, such challenges are very complex but not insurmountable. We have a genuine opportunity to drive improvements for the whole sector through combining the best of innovation with progressive and ambitious leadership from government. Broadly speaking, the risks can be divided into two categories:

1. **The information risks:** the challenges and risks that are created if information about what people do and where people go is public and shared.

[5] https://www.sas.com/content/dam/SAS/en_gb/doc/analystreport/cebr-value-of-big-data.pdf
[6] https://www.papercast.com/insights/14bn-benefits-uk-unlocked-better-use-data-transport/
[7] https://reimaginedmobility.org/freight-data-report/

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2. **The data risks:** the risks that are created with the data-set itself, such as its financial cost and value.

There are also a number of complex challenges across the technical, structural, and policy domains set out below:

- **Lack of a common data framework and poor interoperability.** This means that data is often poorly described, collected and stored in different formats, which makes it difficult to share and use across multiple domains. This is often exacerbated by the use of legacy IT infrastructure across different areas of service provision that do not communicate with other systems. In turn, this can lead to poor data quality, as it is difficult to ensure that data is accurate and consistent when it is stored in different formats. Cybersecurity is also of concern as there is a critical need to ensure that each system or element is 'trusted' and doesn't pose a threat to the security of the other interconnected elements within the system.

- **Poor activity centralisation.** Data-driven initiatives have tended to take place within individual entities or transport modes. For example, the Rail Data Marketplace[8] and the Bus Open Data Framework[9]. Although these initiatives have shown some success, there appears to be little sharing across the wider DfT ecosystem, even if aligned to overarching strategies, which again are largely open to interpretation. Further, misalignments around data ownership and control are slowing the pace in which new products and services can be brought to market. For example, there is currently a lack of consensus on how data should be treated within the Rail Availability and Reservation System (RARS) that prevents rail ticket retailers access to a granular level of data which could be used to invest in the passenger experience.

  Achieving any level of centralisation also carries cybersecurity considerations as singular entities holding or 'gatekeeping' large datasets increases their vulnerability of becoming targeted by threat actors. This means that these entities, be they public or private, must ensure they have invested in robust defences and internal skills and capacity to keep data safe and secure.

- **Uncertainty and underinvestment.** High-levels of uncertainty over the future over many aspects of the transport sector is leading to a scenario where confidence in the market is severely diminished. For example, the Williams-Shapps Plan for Rail (PfR) stated that an 'open by default' approach to data sharing in the rail sector will be implemented through the creation of Great British Railways to better inform journeys, improve transparency and unlock new technology.[10] However, as things stand, the technology industry lacks clarity on the government's plan for delivering the PfR, resulting in a severe slowdown in the pace of urgently needed data-driven

[8] https://www.raildeliverygroup.com/our-services/rail-data/rail-data-marketplace.html
[9] https://www.bus-data.dft.gov.uk/
[10] https://www.gov.uk/government/publications/great-british-railways-williams-shapps-plan-for-rail

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modernisation projects such as digital and mobile pay-as-you-go ticketing that the industry is ready to deliver today[11].

- **Local funding imbalances.** City regions that have been successful in securing funds from the government's £8.8bn City Region Sustainable Transport Settlements (CRSTS) have been able to invest rapidly in new systems and data architectures. This is to be welcomed, however, has also resulted to a scenario where areas benefitting from this funding are now outperforming other areas in terms of technical capabilities.

- **Lack of policy coherence.** There is a mismatch between the policies of different cities and regions in the UK. This lack of coherence can make it difficult to implement national priorities. For example, there are different rail requirements for HS2, within London, and in different parts of the UK. The accreditation processes are also different, making it difficult to ensure that all parts of the UK are able to benefit from national policies in the same way.

- **Lack of civil service capacity.** Resource constraints within the DfT and its agencies, are holding back progress in delivering important strategies such as the TDS. Where limited resource exists, the civil service finds itself needing to reprioritise and allocate resource to new areas such as AI or other novel technologies. In addition, proposed guidance, such as the MaaS Code of Practice[12], is still yet to be delivered, despite the consultation period closing in May 2022.

- **Skills gap.** techUK recently outlined that the transport industry faces a significant skills challenge, and the opportunities from data will not be realised unless we have enough engineers, statisticians, developers, and technologists to make this change[13].The civil service is particularly affected by this challenge, which due to budget constraints, faces difficulty in hiring and training staff in these fields, especially where the race for talent is highly competitive.

Section three – the solutions

Broadly covering questions:

8. *How should data availability, and sharing by transport operators, suppliers and other bodies, be encouraged, facilitated and regulated?*
9. *What skills and capacity do operators, infrastructure providers and local transport authorities need in order to manage their own data well and get the most value out of available data? What help do they need to anticipate and cater for future requirements?*
10. *Is the UK's digital infrastructure sufficient to allow the greatest value to be derived from transport data?*

[11] https://www.techuk.org/resource/techuk-recommendations-for-rail-modernisation.html
[12] https://www.gov.uk/government/consultations/mobility-as-a-service-code-of-practice
[13] https://www.techuk.org/resource/driving-the-future-of-transport-addressing-the-skills-gap.html

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11. *How effectively does the Government use data in appraising and prioritising transport investment?*
12. *What milestones and ambitions should the Government set in this area? How effectively has the Government's Transport Data Strategy identified barriers to sharing and getting value from transport data, and the actions needed to overcome those barriers?*
13. *What is the emerging best practice internationally, in terms both of developing standards and frameworks for sharing and using transport data, and supporting specific innovations? How does the UK compare, and how can it help to shape international standards?*

This section outlines steps that we believe government should take to improve transport's data landscape rapidly. These measures will allow us to harness the power of data to drive positive outcomes against our strategic priorities as a transport sector and economy.

- **Refine and deliver the Transport Data Strategy in full**

The TDS has laid the foundations for addressing many of the complex and deep-seated challenges across transport's data landscape.

A central tenet of the TDS is to drive forward an 'open-by-default' approach to data sharing in transport. While this principle is welcome in theory, the government needs to define what this means in practice for businesses. This should be underpinned by clear milestones and success indicators. We also encourage a mindset of properly analysing and understanding the risks associated with data collection, storage and sharing.

This said, many of the actions proposed in the TDS will undoubtedly help surmount some of the challenges that have been already outlined. For example, the creation of a Transport Data Catalogue and pledge to improve data interoperability, standards and quality, will help make a significant step towards the creation of a dynamic marketplace for transport data. Establishing a 'regular transport data senior user group' will facilitate greater collaboration between government and industry on key issues and emerging trends. The pledge to improve sharing, discoverability, and access of transport data will help foster innovation. Finally, a Data Ethics Panel will help bring forward ethical concerns on the usage of certain data sets to ensure that the usage aligns with GPDR.

Industry stands ready to work with the DfT to develop the TDS and delivering its actions. However, since the TDS was published six months ago, very little delivery has taken place from an external perspective. This is despite the government's recent rhetoric around making the UK a science and technology superpower by 2030. A world-leading data ecosystem must be a core strategy in getting to this ambition. If delivery of the TDS falters, this would undermine efforts made throughout the DfT's work on science and technology. Therefore, we are urging Ministers and senior civil servants to put the TDS at the top of their agendas.

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We would also like to propose that one of the ways to address data quality issues is through the integration of Generative AI and machine learning technology. This technology has the potential to streamline data operations and improve accuracy, completeness, and consistency. Similarly, shareability, discoverability, and access to transport data could be improved through the use of data networks and vaults, which are secure and centralised repositories that store and manage diverse sets of data, facilitating efficient access, sharing, and analysis across multiple users and applications, thus fostering collaboration.

- **Invest in building the capacity and expertise of the Department for Transport's ScITech Directorate and Analysis Directorate**

Delivering the TDS in full requires significant government time, attention and resource. However, as demonstrated in Deloitte's 2017 report[14], increased data sharing can generate impressive returns to the public purse from relatively modest investment in people and systems.

The DfT's Science, Innovation and Technology (ScITech) Directorate and Analysis Directorate are conducting impactful work. However, resource constraints each year limit the teams' delivery and they must make strategic decisions around what to prioritise.

For example, the sudden focus on new areas such as Generative AI, already appears to have diverted resource away from delivery of the TDS. This is a concern, especially given that data is the very foundation of the advanced applications such as Large Language Models (LLMs) upon which Generative AI is based.

We must ensure that the DfT has the in-house capacity and expertise it needs to respond to new trends, while also being able to continue its important 'business as usual' work around data and other technology areas.

This means bigger, and better resourced teams and although we are mindful of the government's imperative to manage cost, we encourage the view that resource spent on growing science and technology capabilities is not a cost, but an investment into the long-term financial sustainability of the Department, the sector, and the wider economy.

- **The Department for Transport should develop and publish a framework for regulating data use-cases**

In recent years, we have seen the government beginning to take positive regulatory steps to improve data availability and standards within some part of the transport sector.

For example, the decision to implement a bus open data policy was largely taken because bus operating companies lacked incentive to do this voluntarily. Given the critical importance of bus services, and the need to make live time data available to passengers

[14] Assessing the value of TfL's open data and digital partnerships

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who may live in places where services are very infrequent, it was a fair and proportionate step for government to intervene and introduce a mandatory scheme.

The government has also laid regulations to mandate electric vehicle (EV) charge point operators to provide data to the Office for Zero Emission Vehicles regarding the reliability of their assets[15]. This decision was taken due to the critical need to improve the consumer experience of EV infrastructure in order to accelerate the transition to EVs and meet our wider environmental goals. This provision of real-time data on the status of a charger and the price being offered to charge will also enable other businesses (e.g. large fleet operators) to develop new services that will help drivers overcome issues such as range anxiety, and ultimately drive uptake of EVs.

Similarly, under proposed regulations for self-driving vehicles, operators will be obligated to regularly share data with the Centre for Connected & Automated Vehicles (CCAV) regarding incidents such as near-misses. This is because it is critical to ensure the safety for passengers and other road users[16].

This paints a picture of the areas that are of high importance to the DfT, including decarbonisation, connectivity and safety. We recommend that the DfT now works to codify and publish its priorities, and the impact this will have for data regulation. This in turn will provide an indication to innovators on the approach government is likely to adopt, and for the private sector to work with the government to implement this in a way that enables further innovation.

- **The government should work with industry to develop a 'middle way' for ensuring data sharing**

There is currently an opportunity to create a new approach for ensuring data sharing, that creates the right incentives without the need for regulation.

This 'middle way' could be employed where it is recognised that market forces alone may not be enough to encourage data sharing or drive higher standards, but a fully regulatory approach is outside the purview of regulators or stifles innovation. The below figure provides a rudimentary framework that techUK has developed.

[15] https://www.gov.uk/government/consultations/the-consumer-experience-at-public-electric-vehicle-chargepoints/the-consumer-experience-at-public-chargepoints#policy-proposals
[16] https://www.lawcom.gov.uk/project/automated-vehicles/

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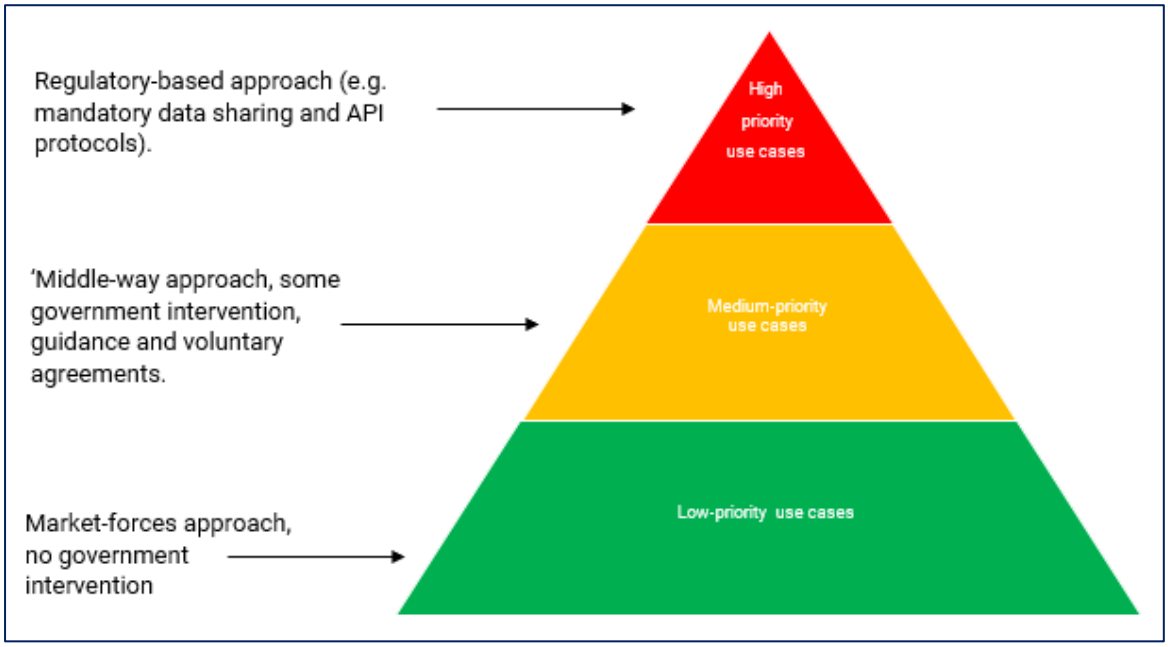
High-level transport data regulation framework



Such approaches could include the increased use of data sharing agreements[17] for which the Information Commissioner's Office has already established best practice. This could also include the use of Memorandum of Understanding agreements between parties. Government, and its contacting authorities, may also create incentives for the private sector to develop such agreements and MOU's through procurement mechanisms or other forms of subsidy. It could also include the application of technologies which allow stakeholders to retain control over their own data, controlling the way in which they share data selectively and securely with others. This latter approach enables situationally specific best practice and trust to evolve, while taking a 'just start' methodology. In all cases a cyber security and privacy case could be developed to help assure the safety of the information being share and its applications.

Developing these approaches will need to take an iterative process, with elements of trial and error. However, the industry stands ready to engage with the government and work to spearhead innovative new approaches through a series of pilots and trials. We believe that this would be well placed to be discussed within the 'regular transport data senior user group' proposed within the TDS.

Conclusion

[17] https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/data-sharing/data-sharing-a-code-of-practice/data-sharing-agreements/#:~:text=Data%20sharing%20agreements%20set%20out,about%20their%20roles%20and%20responsibilities.

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In this evidence we have outlined that the government has at its fingertips the opportunity to drive a major step change in how we use data in transport. The benefits for doing so are far-reaching and we hope will be made evident to the Committee throughout its inquiry.

There are, however, significant hurdles that we must overcome if we are to unleash the power of a more sophisticated use of data fully. Addressing them requires a collaborative approach that industry stands ready to lead and support. We believe that the Transport Data Strategy should be used as a foundation and the first-step towards this future. Delivering it in full should be a priority for the government as we continue to digitise the transport sector, and embrace the power of new technologies to drive major improvements in how we transport people and goods.