THE CASE FOR GOVERNMENT INVOLVEMENT TO INCENTIVISE DATA SHARING IN THE UK INTELLIGENT MOBILITY SECTOR

BRIEFING PAPER

March 2017

CATAPULT
Transport Systems

CATAPULT
Transport Systems

CONTENTS

FOREWORDS

Effective data sharing is critical to establishing the UK as the global leader in integrated, efficient and sustainable transport systems – what we call Intelligent Mobility (IM), estimated to be worth £900bn per annum globally by 2025.

Sharing data in the transport sector and combining it with data from other sectors, is key to delivering the Transport System Catapult's mission of enabling new and innovative mobility solutions to be developed in the UK that will play a leading role in tackling some of our biggest challenges from uneven economic development, a growing and ageing population and the depletion of traditional energy sources.

Working with Deloitte and the Open Data Institute, we have found access to data across the industry to be limited. Organisations are dissuaded from sharing data due to significant actual and perceived risks, high costs and closed cultures. Allowing these barriers to persist means the UK will fail to secure the full benefits of new mobility solutions and not develop a strong presence in an exciting, global sector.

I am therefore pleased to present this Briefing Paper on data sharing which puts forward our recommendations on how government can support the industry to address these challenges from today. We have discussed these recommendations with a diverse range of stakeholders and are confident they can accelerate and enhance existing industry-led initiatives to shift incentives across the sector from not sharing data towards sharing by default.

This is a call to action. Together, government, industry and the wider IM community can work to create an environment where organisations are able to safely and securely share data in a way that respects privacy and which unlocks substantial economic, social and environmental benefits for the UK.

Terry Hill CBE
Chairman, Transport Systems Catapult

We are in the midst of a revolution. Data is changing the world. It has become a new kind of infrastructure that underpins every sector. As this paper explains, transport is no exception and every revolution creates opportunity.

Data is essential to realise the vision of a future transport system that meets the expectations and exploits the capabilities of the internet age. To help people and goods move easily, cheaply and efficiently across every form of transport we need data to flow freely too. That data can help everyone make better decisions: passengers, freight companies, transport operators and policymakers.

Over the last few years we have learnt that when we make data as open as possible it maximises the creation of value and unleashes innovation. Data is unlike many other assets. The benefits from its use and re-use grow exponentially the more it is shared and open, combined and linked with other data.

The benefits of making this change to sharing and openness are widely recognised, but we don't always talk about the opportunity cost of doing nothing. This paper estimates that not sharing and making more transport data open could cost the UK £15bn by 2025. This will mean poorer quality services, reduced transport connectivity and a lost opportunity for the UK to use Intelligent Mobility as a driver for economic growth and social change.

This paper identifies a number of barriers to sharing and making more data open in the transport sector. But as we have seen from many other sectors, these barriers can be removed if government, industry and users collaborate – there are no technical reasons why the transport sector cannot make data flow more freely. I urge the government to quickly adopt the paper's recommendations so the UK can continue to be a world leader in data and a place that grows and nurtures companies that deliver transport services fit for the 21st century.

Sir Nigel Shadbolt
Chairman and Co-Founder of ODI

GLOSSARY

TERM	DEFINITION
Application Programming Interface (API)	A set of functions and procedures that allow the creation of applications that access the features or data of an operating system, application, or other service
Civil Aviation Authority (CAA)	The statutory corporation that oversees and regulates UK civil aviation.
Closed data	Closed data is data that can only be accessed by its subject, owner or holder – whether that is an individual person or single organisation.
Data Infrastructure	Data infrastructure consists of data assets, the organisations that operate and maintain them and guides describing how to use and manage the data. It includes technology, processes and organisations.
Department for Transport (DfT)	The UK's ministerial department that works with agencies and partners to support the transport network that helps the UK's businesses and gets people and goods travelling around the country. It plans and invests in transport infrastructure to keep the UK on the move.
General Data Protection Regulation (GDPR)	EU regulation on the handling of EU citizens' personal data by public and private sector organisations. It is scheduled to come into force in the UK on 25 May 2018.
Global Positioning System (GPS)	A global navigation satellite system that provides location and time specific information to a GPS receiver anywhere on Earth.
International Air Transport Association (IATA)	An international trade association of airlines that supports global standards on airline security, safety, efficiency and sustainability.
Information Commissioner's Office (ICO)	The UK's independent authority set up to uphold information rights in the public interest, promoting openness by public bodies and data privacy for individuals.
Intelligent Mobility	Intelligent Mobility is the smarter, greener, safer and more efficient movement of people and goods around the world.
Mobility as a Service (MaaS)	Mobility as a Service describes a new approach to transport that aims to meet the needs of mobility through services. This is enabled by combining transportation services from public and private transportation providers through an integrated service and payment system.

TERM	DEFINITION
Office for National Statistics (ONS)	The UK's largest independent producer of official statistics and its recognised national statistical institute. It is responsible for collecting and publishing statistics related to the economy, population and society at national, regional and local levels.
Open data	Open data is data that anyone can access, use and share. For data to be considered 'open', it must be; accessible, which usually means published on the web, available in a machine-readable format and have a licence that permits anyone to access, use and share it - commercially and non-commercially.
Personal data	Data from which a person can be identified is personal data, including data that can be combined with other information to identify a person.
Real-time, archive or reference data	Data that describes events as they happen is real-time or near-real-time, the same data collected over time is archive data. Data that describes something at only a single point in time is reference data.
Service-critical and safety-critical data	Data that is necessary to achieve the correct operation of services can be described as service-critical, an extension of this is where data is necessary to ensure the wellbeing of individuals which can be described as safety-critical.
Shared data	Shared data is data that a specific person or group of people, who are not the data subject, owner or holder can access. There are three main types of shared data: • Public access is data that is available to anyone under terms and conditions that are not open. • Group-based access is data that available to specific groups of people or organisations who meet certain criteria. • Named access is data that is shared only with named people or organisations.
Science, Technology, Engineering and Maths (STEM)	The name given to the broad range of subjects that cover different science disciplines, technology, engineering and mathematics.
Transport for London (TfL)	The local government body responsible for the transport network in the Greater London area.
Transport Systems Catapult (TSC)	The UK's technology and innovation centre for Intelligent Mobility.

EXECUTIVE SUMMARY

The free flow of transport data underpins the development of new mobility solutions that provide integrated, efficient and sustainable transport systems for people and goods.

These solutions can contribute to tackling some of the UK's biggest economic, social and environmental challenges, leading to annual market and non-market benefits of nearly £14bn pa by 2025.

This vision is at risk because currently data is not being shared in the transport sector due to concerns around privacy and cost, as well as closed cultures in the sector. The consequence of not improving data sharing will be £15bn in lost benefits by 2025.

We are recommending government work with industry to break down barriers and shift cultures towards data sharing by default so that the UK can be at the forefront of developing new mobility solutions and ensure it captures their full benefits.

THE BENEFITS OF SHARED DATA

By the end of 2020 there will be over 50 billion connected devices globally collecting over 2.3 zettabytes of data each year.[1] Shared and open[2] data gathered from these devices can underpin mobility solutions that support integrated, efficient and sustainable transport systems – what we call Intelligent Mobility (IM).

Mobility solutions are already coming to market. The sharing and release of data on arrivals, departures, timetables, routes and fares through APIs by Transport for London (TfL) has supported the development of over 200 apps saving Londoners time and money.[3] Microlise, a fleet management and software products firm, combines sensor, GPS and phone data to provide vehicle and delivery tracking and performance reports that improve fuel efficiency and safety.[4] The mobile app developer, Strava allows users to 'post' and share data in order to measure and improve athletic performance.[5]

These mobility solutions are only the tip of the iceberg. Taking advantage of advances in machine learning, artificial intelligence and the lower cost of computing, data can be used to power brand new mobility solutions from autonomous vehicles to integrated smart ticking to optimising network resilience, as well as many other solutions not yet imagined.

Sharing data will allow the UK to be at the forefront of developing world-leading mobility solutions and secure its share of a global market estimated to be worth £900bn pa by 2025[6]. Underpinned by data, the IM sector can become a source of high-skill jobs and economic growth – estimated at c.3,000 jobs and £4bn GVA pa in the UK

[1] Source: Statistica, https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/ and Cisco, http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html

[2] Shared data is defined as data that a specific person or group of people, who are not the data subject, owner or holder can access. Open data is defined as data that anyone can access, use and share. This Briefing Paper focuses primarily on shared data, but the benefits will be even larger from more open data.

[3] Source: Why a new website but no app? Part 1, https://blog.tfl.gov.uk/2014/03/12/why-a-new-website-but-no-app-part-1/

[4] Source: quoted in The Transport Data Revolution, https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf

[5] Source: ibid.

[6] Source: TSC Strategy, http://tsctechstrategy.co.uk/

from connected and autonomous vehicles technologies alone[7]. Innovators can use transport data to create new solutions to support public sector reform, increase productivity, support regional economic growth and expand exports. IM can play a crucial role in delivering the government's Industrial and Digital Strategies.[8]

Sharing data to build mobility solutions such as journey planners, control systems and connected vehicles can save businesses money by reducing congestion — worth £4bn pa in terms of saved time by 2025 in the UK. Sharing data to optimise network efficiency and improve resilience can also save the UK freight industry at least £0.5bn pa by 2025.

But there are broader social and environmental benefits from sharing transport data for the UK. New mobility solutions can support other market developments to:

- Reduce the number of fatal and non-fatal accidents on our roads caused by human error as vehicles develop greater automation, saving over £4bn pa in 2025.

- Enhance freedom of movement and access to public services for disadvantaged groups through more bespoke transportation solutions, with associated social benefits worth £0.1bn pa in 2025.

- Cut carbon emissions from road vehicles through system-wide optimisation that eliminates inefficiencies and promotes sustainability, equivalent to nearly £1bn pa in 2025.

THE BARRIERS TO SHARING DATA

Current levels of data sharing in the UK transport sector constrain the development of new mobility solutions and will reduce the size of future benefits. The UK risks being overtaken by other countries as organisations across the sector face barriers to share data or access the data of others.

Our analysis and discussions with industry and government reveal three core reasons why organisations lack incentives to share data:

- The fear that shared data could lead to breaches in privacy, security and safety;

- The belief that the costs of sharing data outweigh the benefits; and

- The focus by organisations on their own mode of transport, limiting opportunities and awareness to make data available beyond their segment.

These barriers are exacerbated further by the ongoing shortage of data literacy skills to effectively use and re-use data to maximise its benefits and support the emergence of new business models.[9]

Industry is taking steps to improve access to data, yet these actions do not go far enough, fast enough. This hinders the UK growing the sector and reaping the benefits of new mobility solutions.

We estimate that if nothing is done to improve access to data and break the barriers to sharing, the UK stands to lose £15bn in mobility solution benefits by 2025 than if data were effectively shared. The UK will not be in a position to lead the development of new disruptive technologies and the resulting transport provision will remain siloed and inefficient.

---

[7] Source: Market Forecast for Connected and Autonomous Vehicles, Transport Systems Catapult forthcoming
[8] See Industrial Strategy: https://www.gov.uk/government/consultations/building-our-industrial-strategy and Digital Strategy:
  https://www.gov.uk/government/publications/uk-digital-strategy
[9] See for example, TSC research on the skills gap, https://tics.shef.ac.uk/wp-content/uploads/2016/10/IM-Skills-Strategy-2016-1.compressed.pdf.

IMPROVING SHARED DATA: OUR RECOMMENDATIONS TO GOVERNMENT

The barriers to sharing data can be removed. Drawing on experiences from other sectors such as banking, agriculture and retail, it is possible to use current technologies and policies to create the right incentives to share data in a way that respects the privacy of individuals.

The transport industry recognises its role in improving access to data, but it needs help to coordinate a system-wide approach, challenge current viewpoints and break down siloes. We are asking government to work with industry to create the conditions that will support cultural change across industry to share more data so the UK can become a global leader in IM.

We recommend government should:

1. Immediately establish a Policy Advisory Group comprising industry, government, academia and users to set out the agenda, roles and responsibilities for a Mobility Data Hub that will be a neutral voice in improving access to data tasked with tackling barriers to data sharing.

   This body, possibly an existing organisation in the sector, would begin operations in 2018. Work should include: delivering three pathfinder projects to demonstrate how data can be used to solve challenges such as urban congestion, accessibility of services in rural areas and freight optimisation; providing guidance on technologies for data access and disseminating case studies.

   The new Mobility Data Hub should support government consultations on the appropriateness of new fiscal incentives to support industry making data accessible and how government can expand requirements on organisations receiving public funds to deliver mobility services to openly publish or share data. These consultations could begin in 2018, in order to implement changes by 2020.

2. Develop and publish amendable contract and licensing templates for use across industry to reduce the time and costs to agree data sharing – to be completed by the start of 2018.

3. Provide guidance on how data can be shared or opened between organisations without breaching competition law or new regulations such as the General Data Protection Regulation (GDPR) in order to reduce uncertainty and risks around data sharing – to be completed by the start of 2018.

4. Continue to publish open data in a way that focuses on the full end-to-end passenger and freight journey rather than individual segments in order to break down cultural barriers between different transport modes.

5. Ensure civil servants involved in mobility have the right training to understand the importance of shared and open data and how new ecosystems and business models are facilitated by this.

Getting data right can help the UK be at the forefront of new mobility solutions and harness these to be a catalyst for economic growth and wider social benefits. The aggressive timelines for our recommendations reflect the need to act now to maximise the future benefits and enjoy them as soon as possible.

SHARING AND OPENING DATA UNDERPINS THE DEVELOPMENT OF NEW AND INNOVATIVE MOBILITY SOLUTIONS

An explosion in data from…

- Mobile phones
- The Internet of Things including street sensors, vehicle tracking and wearables devices
- Crowdsourcing

…can be used in more sophisticated ways through…

- Machine Learning and Artificial Intelligence
- Cheaper, faster and more powerful computational facilities
- Greater focus on data literacy

…leading to new mobility services for customers and businesses

- Connected and autonomous vehicles
- Intermodal smart ticketing
- Freight tracking, delivery optimisation and platooning of HGVs
- Per journey insurance and other new services in adjacent sectors
- Journey planning and other data services

MOBILITY SOLUTIONS BUILT ON SHARED AND OPEN DATA CAN DELIVER SMARTER, GREENER AND MORE EFFICIENT JOURNEYS THAT HAVE WIDER SOCIO-ECONOMIC BENEFITS

By 2025, the benefits of mobility solutions are estimated to include:

At least
3,000
new high skilled jobs

A source of
£4bn GVA
and growing exports

Contributing to
improved productivity
and
lower costs

Faster journeys and less congestion, worth
£4bn pa

Safer roads and fewer accidents, worth
£4bn pa

Improved regional connectivity and inclusion of different communities, worth
£0.1bn pa

Optimised and more resilient delivery of freight, worth
£0.5bn pa

Lower emissions, equivalent to saving
£1bn pa

UNDER THE STATUS QUO, DATA ACCESSIBILITY LEVELS WILL REMAIN INADEQUATE FOR THE UK TO CAPTURE THE FULL BENEFITS OF NEW MOBILITY SOLUTIONS

Currently there exist three barriers to data sharing in the transport sector:

External barriers due to organisations being fearful of breaches in privacy, security and safety	Internal barriers due to perceptions that the costs of sharing outweigh the benefits	Cultural barriers across the sector leading to siloed thinking and not sharing data beyond organisations' own mode of transport

The impact of not improving access to data risks the UK not fully enjoying the benefits of new mobility solutions

= A LOSS OF OVER
£15bn by 2025

GOVERNMENT CAN WORK WITH INDUSTRY TO SOLVE DATA CHALLENGES TO ENSURE THE UK ENJOYS THE FULL BENEFITS OF NEW MOBILITY SOLUTIONS

Support secure and safe data access in a way that respects privacy	Help reduce the costs of sharing and provide guidance on how to share and make open	Lead by example to shift cultures towards sharing and openness

- Establish a Policy Advisory Group to define the roles and responsibilities of a new Mobility Data Hub

- The Hub to be a neutral voice to advocate and provide guidance on data accessibility

- Launch three demonstrators to show how data can be shared safely and securely to tackle key societal issues

- Provide amendable licensing templates to be used for data sharing

- Provide guidance on the application of competition law and privacy regulations in the context of data sharing

- The Mobility Data Hub to support government consult on fiscal incentives to improve data sharing and publishing such as R&D relief and challenge funds

- Continue to release open data in a way that emphasises mobility rather than transport modes

- Ensure civil servants have the right training to facilitate data sharing and enable new business models

- The Mobility Data Hub to support government consult on using procurement spending to mandate data sharing and publishing

THE BENEFITS OF SHARING DATA IN TRANSPORT

Sharing data is critical to the development of new transport products and services that provide holistic mobility solutions. Already today, solutions being developed that improve outcomes for businesses and society. Increasing data sharing further can allow the UK to capture the full benefits of new mobility solutions and ensure the transport sector contributes to solving some of our biggest challenges.

THE EXPLOSION OF DATA IN THE TRANSPORT SECTOR

The continuing decline in the cost of software and hardware is leading to the rapid rise of the Internet of Things (IoT) — devices, vehicles, buildings and other items with network connectivity that allow them to collect data and share it with each other. This is leading to an explosion in the amount of data that is being generated and is available to underpin new products and services.

FIGURE 1: Number of connected devices, worldwide from 2012-2020

It is estimated that the global number of connected devices will reach 50 billion in 2020, and generate over 2.3 zettabytes of data each year (equivalent to 2.3 trillion gigabytes).[10] Data is the fuel for innovation and powers the services and apps we take for granted today. It has played a significant role in growing the digital economy 32% faster than the rest of the UK economy.[11]

This data explosion is now at the centre of a revolution in the transport sector. The prevalence of the IoT in the sector, the ubiquity of Wi-Fi on public and private transport services and ongoing recording of travel patterns mean that more data than ever is generated on how people and goods move, where they go and the environment they travel in. Geospatial data generated from mobile phones and wearable devices, data feeds from social

[10] Source: Statistica, https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/ and Cisco,
http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html
[11] Source: Tech Nation quoted in: UK's digital industries growing 32pc faster than wider economy,
http://www.telegraph.co.uk/finance/businessclub/technology/12150691/UKs-digital-industries-growing-32pc-faster-than-wider-economy.html

media and willingness by users to crowdsource opinions and plug information gaps, mean data from the transport sector combined with data from other sectors has the potential to create a range of new, disruptive services that span multiple sectors.

HARNESSING TRANSPORT DATA TO BUILD NEW MOBILITY SOLUTIONS

A number of organisations are taking advantage of more transport data and advanced analytical techniques to develop new products and services that seek to integrate journeys in an efficient, affordable and sustainable manner – what we call Intelligent Mobility (IM).

An explosion in data from…

Mobile phones

The Internet of Things including street sensors, vehicle tracking and wearables devices

Crowdsourcing

…can be used in more sophisticated ways through…

Machine Learning and Artificial Intelligence

Cheaper, faster and more powerful computational facilities

Greater focus on data literacy

…leading to new mobility services for customers and businesses

Connected and autonomous vehicles

Intermodal smart ticketing

Freight tracking, delivery optimisation and platooning of HGVs

Per journey insurance and other new services in adjacent sectors

Journey planning and other data services

FIGURE 2: Data underpinning new mobility services

Already today, there are examples of new IM products and services that have come to market. In the UK, we are seeing the emergence of a vibrant and diverse sector involving multinationals, start-ups, the public sector and academia that is delivering user-focused mobility solutions. Below we provide a snapshot of some of the businesses that have emerged in the UK to take advantage of the greater availability of transport data and who have brought to market innovative mobility services, often with brand new business models.

- Citymapper is a service that began in the UK. It draws on transport and other data from multiple providers to offer users the ability to compare different journey options and integrate journeys across different modes of transport in cities.

- SilverRail is a firm of developers, mathematicians and e-commerce experts seeking to improve the customer experience on the rail network through new products and services that integrate payments, ticketing and routing to create a seamless experience across different networks.

- Masabi is a UK-based company that makes city transport smarter by mobility ticketing that simplifies tickets, fare collection and validation for transport providers. It combines data from transport, financial services and telecoms.

- Opinsta is a start-up supporting the rail and aviation sectors improving the customer experience through taking operational and other data feeds to identify and resolve customer problems, defects and act on feedback.

- Intelligent Telematics provides fleet operators and freight businesses with asset monitoring and tracking solutions to optimise efficiencies.

- Food on demand services such as Deliveroo, JustEats and Uber Eats leverage transport data to create scalable and versatile networks to expand the market for restaurants.

- Slide is a new service operating in Bristol that matches passengers using data to provide affordable, fixed fare shared rides to minimise the gap between the main journey and the first and the last miles.

FIGURE 3: Examples of new mobility solutions and related services powered by data in the UK[12]

Many of the organisations developing new mobility solutions are using non-traditional business models that do not charge the end user directly. Instead, revenue can be earned from aggregating data and selling insights to third parties, charging suppliers to match with customers, explicit agreements with users around data exchange, 'freemium' pricing and advertising. What all these mobility solutions have in common is that they involve the flow of data from many different sources and between suppliers and customers.

However, these existing mobility solutions are only the tip of the iceberg. Taking advantage of advances in machine learning, artificial intelligence and the lower cost of computing, data can be used to power brand new mobility solutions from autonomous vehicles to integrated smart ticking to optimising network resilience, as well as many other solutions not yet imagined.

THE BENEFITS OF DATA SHARING FOR THE UK

Organisations are already enjoying a number of benefits from sharing data and making it open. For example, an app developed by Gatwick Airport and AirportLabs draws on shared data on departure times, ground handlers' performance, airline's turn times, train network issues, weather data, etc. to provide real-time information to 3,000 staff members in order to improve operational efficiencies to save money and attract more travellers wanting a better customer experience.[13] Similarly, using data produced by the Wi-Fi network on its London

---

[12] For more examples, see The Transport Data Revolution, https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf

[13] Source: Gatwick's 'data socialist' proves value of data sharing with pioneering Airport Community app, May 2016, http://www.futuretravelexperience.com/2016/05/gatwicks-proves-value-of-data-sharing-with-airport-community-app/

Underground stations, Transport for London (TfL) has been able to better understand passenger journeys and predict overcrowding.[14]

Data sharing and the resulting mobility services will ultimately benefit users. In the Gatwick Airport example, travellers enjoy a better customer experience from fewer delays and a more seamless, integrated journey. The release of TfL open data has powered over 200 new apps and helped save Londoners time worth £58m pa.[15]

But the benefits will go even broader than this, affecting the wider economy and society. As the IM sector matures with more advanced mobility solutions underpinned by data sharing coming to market, significant economic, social and environmental benefits can be unlocked.

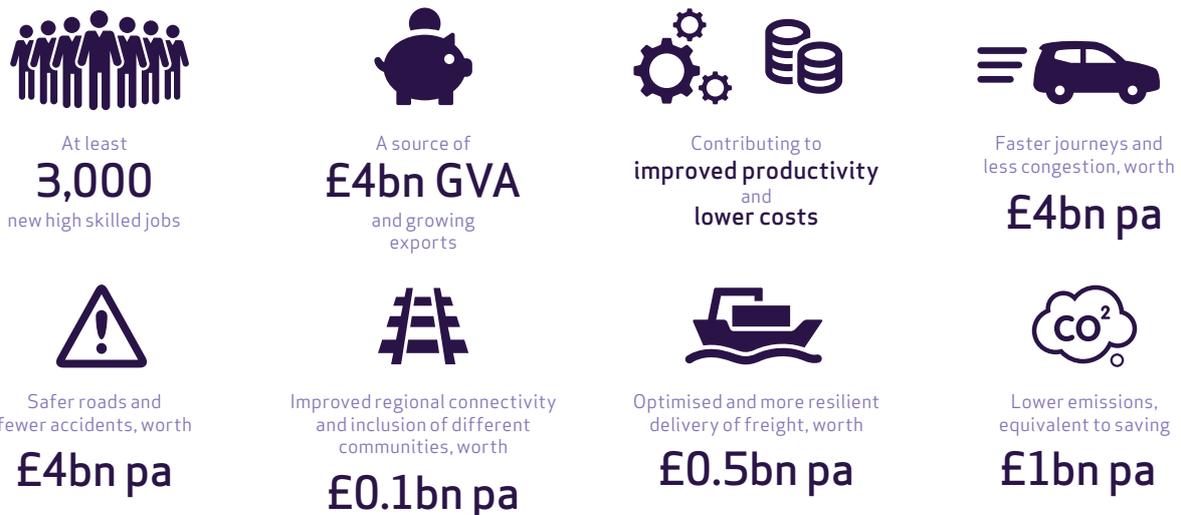| At least **3,000** new high skilled jobs	A source of **£4bn GVA** and growing exports	Contributing to **improved productivity** and **lower costs**	Faster journeys and less congestion, worth **£4bn pa**
Safer roads and fewer accidents, worth **£4bn pa**	Improved regional connectivity and inclusion of different communities, worth **£0.1bn pa**	Optimised and more resilient delivery of freight, worth **£0.5bn pa**	Lower emissions, equivalent to saving **£1bn pa**

FIGURE 4: Selected economic, social and environmental benefits from data sharing by 2025

Many of the thematic pillars of the 2017 Industrial Strategy such as upgrading infrastructure and delivering economic growth will have to be supported by new mobility solutions that improve productivity and reduce the costs of doing business if they are to be successful.[16]

Sharing data will allow the UK to develop world-leading mobility solutions and secure its share of a global market estimated to be worth £900bn pa by 2025.[17] New analysis commissioned by TSC suggests a more mature IM sector could become a source of approximately 3,000 high-skills jobs and £4bn GVA pa in 2025 in the UK from connected and autonomous vehicles technologies alone.[18] The sector which includes sensing and mapping hardware and software, data security software and sensors could also become a significant source of exports.[19]

We have developed a bespoke economic and social impact calculator to assess the monetary benefits arising from expected new mobility solutions in the UK that leverage data sharing. These benefits include reductions in congestion, improved freight efficiency, fewer accidents and greater connectivity and inclusivity.[20]

The costs of doing business will be reduced as new mobility solutions that draw on shared and combined data such as journey planners, system-wide planning and connected vehicles work together to alleviate congestion

[14] Source: Here's what TfL learned from tracking your phone on the tube, http://www.gizmodo.co.uk/2017/02/heres-what-tfl-learned-from-tracking-your-phone-on-the-tube/

[15] Source: Why a new website but no app? Part 1, https://blog.tfl.gov.uk/2014/03/12/why-a-new-website-but-no-app-part-1/

[16] Source: https://www.gov.uk/government/consultations/building-our-industrial-strategy

[17] Source: TSC Strategy, http://tsctechstrategy.co.uk/

[18] Source: Market Forecast for Connected and Autonomous Vehicles by Transport Systems Catapult (forthcoming) – numbers only include Connected and Autonomous Vehicles technologies.

[19] Source: Ibid

[20] Details of all calculations can be found in a separate methodological annex. The benefits are relative to these new mobility solutions not being developed. Data used was from DfT, WebTAG and other public sources. Cost of time here includes business and leisure.

on the roads. We have conservatively forecast the savings made from reduced journeys for cars, buses and HGVs could be worth £4bn pa in terms of saved time in 2025.

Leveraging mobility solutions that track goods across different transport modes (from shipping to rail to HGV to delivery truck) can contribute towards optimising the movement of freight and improving resilience. We estimate that sharing data to maximise the use of HGV's capacity to move freight could save the industry at least £0.5bn pa by 2025 in running costs.[21]

Improved mobility solutions such as more vehicles with greater automation and less reliance on human intervention can also reduce the number of fatal and non-fatal accidents on our roads caused by human error. Using conservative assumptions on the number of accidents prevented, the savings, in terms of health care costs and loss of productivity from fewer human-error road accidents, could be worth £4bn pa by 2025.

Mobility solutions that improve network connectivity between cities and regions can also tackle uneven regional economic development. If mobility solutions are able to support the introduction of more bespoke and affordable transport solutions (such as more non-scheduled public transport options), this can result in more transportation options for excluded groups. On the basis of a moderate rise in the number of journeys from excluded groups due to improved mobility solutions, we estimate the benefits could be worth £0.1bn pa.[22]

There will also be environmental benefits. The rapid depletion of traditional energy resources could be slowed through data sharing that allows system-wide optimisation that eliminates duplicative journeys, maximises capacity and promotes the switch to electric from petrol or diesel vehicles. We estimate the reduced carbon emissions from road users could be worth nearly £1bn pa by 2025.

TAKING STEPS TO BE A WORLD LEADER IN MOBILITY SOLUTIONS

The government recognises the benefits that data sharing can bring in terms of new mobility solutions. It is establishing a business and regulatory environment that is conducive to the UK attracting investment and research to be the global leader in IM.

The 2017 budget committed £270m to put the UK at the forefront of disruptive technologies including driverless cars and provided funds for up to 1,000 new PhD students and fellowships in STEM subjects – these build on other initiatives to improve levels of data literacy.[23] Nearly £700m has also been allocated for local authorities to tackle road congestion, which could harness data sharing to provide new solutions.

However, the UK is not alone in pioneering new mobility solutions or creating a conducive environment for them. Countries from Finland to China to the United States are actively developing new mobility solutions with organisations such as MaaSGlobal, Baidu, Amazon and Alphabet all trialling high-profile prototypes that have data at their core. Similar to the UK, the United States and China have not ratified the Vienna Convention on Road Traffic which allows them to test autonomous vehicles on the road as they are not bound by the requirement that "every driver shall at all times be able to control his vehicle".[24]

This is a competitive area with many countries seeking to win a share of the annual £900bn global market in 2025. If data cannot flow freely across the sector, the UK risks being left behind other countries developing new mobility solutions and becoming a follower rather than a mobility leader.

---

[21] Public data on freight is limited and this estimate is highly conservative based on what DfT publish.
[22] Based on WebTAG data on the social value of journeys.
[23] For example the Digital Academy for civil servants, https://www.gov.uk/government/groups/digital-academy
[24] Quoted in: Britain to lead race for self-driving cars due to 'blind luck' of not signing 1968 Vienna Convention, June 2015,
   http://www.ibtimes.co.uk/britain-lead-race-self-driving-cars-due-blind-luck-not-signing-1968-vienna-convention-1505782

BARRIERS TO SHARING DATA IN TRANSPORT

Data sharing is currently insufficient for the UK to secure the full benefits of new mobility solutions. Industry is taking steps to improve access to data; but on their own these steps are unlikely to transform incentives to share data. The consequence of not improving accessibility will be lower benefits and a transport network that remains siloed, inefficient and unsustainable.

THE NEED TO SHARE AND PUBLISH DATA

Data that is shared or made open for use and re-use can be harnessed by a variety of organisations to build innovative new mobility solutions. While some data may need to remain closed due to privacy, security and commercial confidentiality reasons, we believe a significant amount of transport data can be shared or, better still, made open. Sharing can be group-based, on a named basis or with only few restrictions – described in the ODI data spectrum below.

THE DATA SPECTRUM: INTELLIGENT MOBILITY

Small / Medium / Big Data

Personal / Commercial / Goverment Data

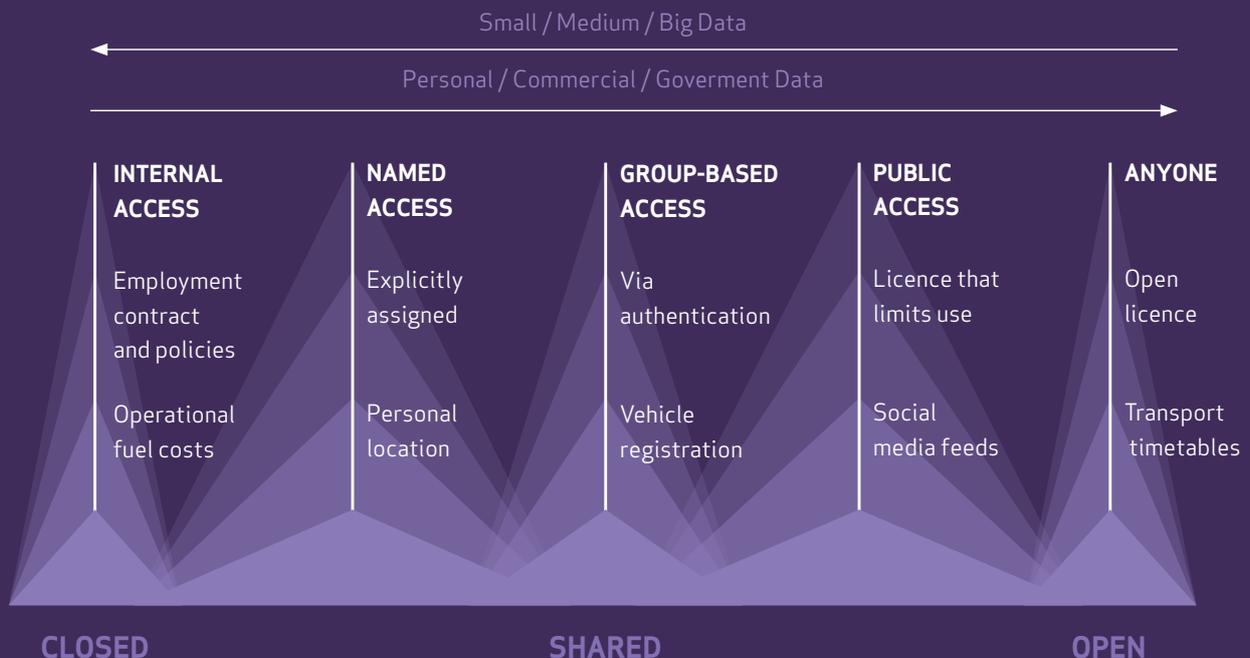| INTERNAL ACCESS	NAMED ACCESS	GROUP-BASED ACCESS	PUBLIC ACCESS	ANYONE
Employment contract and policies	Explicitly assigned	Via authentication	Licence that limits use	Open licence
Operational fuel costs	Personal location	Vehicle registration	Social media feeds	Transport timetables

CLOSED   SHARED   OPEN

FIGURE 5: The Data Spectrum applied to Intelligent Mobility

Parts of the transport industry already have a strong culture of data sharing and openness. The travel and aviation sector has long shared data on flights, routes, safety & security critical asset information and prices to improve the customer experience, widen connectivity, ensure safety and expand the market through international bodies (e.g. International Air Transport Association, IATA), domestic regulators (e.g. the Civil Aviation Authority, the CAA) and commercial services (e.g. Amadeus and SkyScanner). The Department for Transport and other providers of public transport services such as TfL also already publish a wealth of open transport data.

But we can go further than this. In particular, a wealth of transport data can be shared more widely to stimulate the development of new mobility solutions. Below is a high level summary highlighting who might use different transport datasets across the IM sector based on our discussions with industry.

DATASET	POTENTIAL USERS AND RE-USERS OF DATA (LIST NOT COMPREHENSIVE)						
	Infrastructure operators	Transport network operators	OEMs	App and other mobility solution providers	Passengers	Adjacent sectors	Policymaking and research (sector facilitators)
Personal and vehicle location data	✓	✓	✓	✓	✓	✓	✓
Network performance and operations data	✓	✓	✓	✓			✓
Public transport schedules data	✓	✓		✓	✓	✓	✓
Safety and accident data		✓	✓				✓
Passenger flows and volumes data	✓	✓		✓		✓	✓
Freight flows data	✓	✓		✓		✓	✓
Licensing data					✓		✓
Infrastructure, asset and network data	✓	✓		✓		✓	✓
Emissions and environment data			✓	✓			✓
Payment and transactions data		✓		✓		✓	
Sentiment data		✓		✓	✓		
Works data covering the quality of roads, rail, etc.	✓	✓		✓		✓	✓

FIGURE 6: Examples of datasets to be shared and their potential users / re-users for IM

Our discussions with industry suggest that engineering or technological impediments are not major barriers to sharing more transport data, while still respecting the privacy of individuals. For example, data from smart travel cards which contains individual identifiers could be shared with users' consent to selected organisations who are able to articulate to users how their data will be used and the resulting direct benefits to users. Other data such as the journeys of individual freight items could initially be made available in archive form or aggregated up to avoid identification of particular items.

Some stakeholders have noted the parallels with data sharing and seat belts. They noted that all vehicle manufacturers implemented design changes to incorporate seatbelts and other safety features as standard practice from the 1960s following public outcry – suggesting that that with the right incentives, industry can design mobility solutions that 'bake in' data security as standard. Technology is not a barrier to data sharing.

INITIATIVES TO IMPROVE DATA SHARING

The industry recognises the benefits from data sharing and is taking a number of steps to further improve data sharing. Some examples include:

- The Society of Motor Manufacturers and Traders (SMMT) has set out directions and guidance for the sharing of vehicle-generated data, whilst considering privacy, safety and security implications.[25]

- Transport for Greater Manchester has implemented a data aggregation platform with Black Marble and Microsoft to provide a rapid development environment for third party developers to create innovative new services.[26]

- National Rail Enquires' DARWIN is providing real-time arrival and departure predictions, platform numbers, delay estimates, schedule changes and cancellations, and making this available to the developer community under Open Government Licence.[27]

- eCall is a European initiative that shares live data on accidents for emergency responders to bring rapid assistance to motorists. It has already resulted in a 50% improvement in response times in rural areas and 40% in urban areas.[28]

LOW LEVELS OF DATA SHARING IN TRANSPORT

While the above initiatives are welcome and will have an impact, they do not go far enough, fast enough. They do not take a system-wide approach to improving data sharing across all modes of transport and in many cases lack a neutral voice to help resolve disputes and bring together the diverse range of stakeholders from outside the traditional transport sector involved in IM.

[25] Source: https://www.smmt.co.uk/wp-content/uploads/sites/2/SMMT-CAV-position-paper-final.pdf
[26] Source: http://www.blackmarble.co.uk/portfolio/tfgm/
[27] Source: http://www.nationalrail.co.uk/100296.aspx
[28] Source: https://ec.europa.eu/digital-single-market/en/ecall-time-saved-lives-saved

Our discussions with industry highlighted a number of examples of data not being shared or accessed that is preventing the emergence of new mobility solutions.[29]

- Local bus franchises have struggled to share fare data, because of concerns around competition law or fear that their data will be misinterpreted by third parties. In some areas this lack of complete data has prevented the development of integrated mobility platforms that could have improved journey planning and service provision for bus users.

- In urban areas with dense road networks, some local authorities have not published real-time or near real-time traffic count generated by their monitoring systems due to the costs associated with data extraction and cleaning. This has meant journey planning services are often incomplete or are forced to use historic data reducing their efficacy.

- When some organisations involved in private and public transport provision have shared their data or made it available as open data, they have received little or no take-up due to limited awareness or no use cases being available to showcase how the data can be exploited.

- Data on goods being moved, their destination and their content continues to be rarely shared outside organisations reducing the ability of the logistics industry to take system-wide actions in response to congestion, natural disasters and other shocks to resilience.

From our wider discussions with industry, academia and government and review of public materials, we believe these examples to be indicative of the wider picture: a situation where levels of data sharing are much lower than where they should be for the UK to secure the full benefits of IM.

[29] These examples have been anonymised.

THE REASONS FOR LOW LEVELS OF DATA SHARING

Our analysis and discussions with industry reveal three core reasons why organisations lack incentives to share data:

External barriers across the sector:
- Privacy
- Security
- Safety

Internal organisational barriers:
- Costs of sharing
- Data treated as a 'traditional' asset
- Lack of guidance on how to share safely

Cultural barriers across the sector:
- Thinking in silos
- No holistic vision for mobility

THESE BARRIERS ARE EXACERBATED BY THE GAPS IN DATA LITERACY

FIGURE 7: Barriers to data sharing in transport

ACTUAL AND PERCEIVED CONCERNS OVER PRIVACY, SECURITY AND SAFETY

In recent years there have been a number of high-profile data breaches that have resulted in a loss of trust in data privacy and security and had major financial and operational implications for the organisations involved. In the telecoms sector, the breach of over 155,000 TalkTalk customers' data resulted in a fine of £400,000 from the regulator, the loss of 100,000 customers and extra costs of £60m due to settling damages and improving security.[30] In the case of Yahoo!, the hacking of 1.5bn users caused major reputational damage and its share price falling by 7%.[31] The impact of a data breach can be significant.

A number of industry respondents highlighted similar risks around transport data being breached and used maliciously as the main reason for not sharing data. The concern was expressed that if data they had generated or were responsible for was compromised, they would be liable for any consequences arising from a loss of privacy, reduced security and reduced safety. This fear was exacerbated by a lack of confidence in authorities being able to effectively prosecute people responsible for breaches and/or guarantee compensation. For many organisations, if data security could not be guaranteed there was a preference to adopt a closed approach to data.

The changing regulatory environment was also seen as a further disincentive to share. Upcoming EU regulation such as the General Data Protection Regulation (GDPR), which comes into force in the UK in 2018, and the ePrivacy Regulation will establish more stringent rules and heavier fines when privacy is breached.

These concerns around data privacy are important and in a number of cases mean a particular dataset cannot be shared or made open. However, we note across the industry there was no consensus as to what constitutes private data, with differing views of what data could be shared suggesting some instances organisations may be too risk averse compared to others. Indeed, different industry organisations also expressed different overall attitudes towards risk and data sharing.

While data in the transport sector is different in scope from other sectors, examples from banking and retail show it is possible to overcome barriers around privacy, security and safety.

[30] Source: TalkTalk fined £400,000 for theft of customer details, October 2016, http://www.bbc.co.uk/news/business-37565367
[31] Source: Verizon Getting 7% Discount on Yahoo After Massive Hacks, February 2017, http://www.newser.com/story/238697/verizon-getting-7-discount-on-yahoo-after-massive-hacks.html

Transport Systems Catapult   The case for government involvement to incentivise data sharing in the UK Intelligent Mobility sector

SECTOR	WHY COMPARABLE?	HOW DATA IS BEING SHARED
Banking	Individual customer data is typically confidential and sensitive containing personal financial details – sharing will unlock a range of benefits from more switching and better deals for customers and reduced costs of reconciling payments for SMEs.	The Open Banking Working Group has been established to develop open standards for sharing data via open APIs in a way that is secure and respects privacy and encourages the development of new services for customers.[32]
Retail	Individual customer data that is generated through retail transactions can contain important insights on personal preferences and the customer experience – sharing this data between retailers and making it open to others to see can improve the overall customer experience, promote switching and allow for better targeted marketing.	Online retailers such as Amazon, eBay and Etsy provide opportunities for customers to leave public feedback that can be anonymous (or named, depending on customers' preferences), allow peer-to-peer policing to maintain standards and seek to articulate how the overall customer experience improves with more data sharing.

FIGURE 8: Examples of data sharing in industries with similar characteristics to transport

Not exploring technologies used in other sectors to securely share data or establishing protocols to enact if breaches do occur could mean data sharing levels remain too low, and the UK misses out on opportunities to develop new mobility solutions.

COSTS OUTWEIGH THE BENEFITS

A number of industry stakeholders noted the high costs involved in securing access to data or making it available to others. One organisation quoted 18 months as the typical length of time required to negotiate access to data covering issues including ownership, licensing and revenue sharing issues. This cost was particularly acute for small and medium sized businesses without venture capital backing who could not afford legal advice to navigate through complex agreements. Given that value is often derived from combining multiple datasets, the barriers to acquisition for each dataset and abiding the terms of these agreements makes it hard to create and test innovative products.

From the perspective of data holders, a number of organisations cited the high cost of making data available in a shareable format as a reason they did not share. For example, Local Authorities, often a source of a large number of IM datasets, have found it difficult to justify the cost of publishing data openly or sharing it in a time of fiscal constraints. These costs were often increased where organisations' datasets included data from third parties, making it time-consuming to unpick or disaggregate data for sharing without having to renegotiate licensing conditions which typically prohibited further dissemination.

In other instances where cost was less of an issue, some organisations were reluctant to share their data, believing that if shared they would lose any competitive advantage and not be able to extract the full value from their own data. This also linked to an attitude held by some organisations that all data held must 'be worth something' and so should not be shared without strict conditions or charging third parties.

Fears around the application of competition law were also expressed by a number of industry stakeholders as reasons not to share data – for fear of their organisation being seen to use data sharing as a means of collusion. This concern was influenced by previous competition investigations in the sector and new concerns that have been raised relating to telematics data from vehicles.[33]

These concerns are not trivial. However, in many cases they may be overstated and examples from other sectors reveal the benefits from sharing can be much larger than the costs.

- When the public sector has invested in making more data open, the 'return on investment' can be positive as seen in the success of the Breakthrough and Release Funds creating a variety of savings from operational cost reductions (£50k savings due to the York Open Service Directory), improved energy consumption (Hot Harrow) and new products and services (Data Mill North).[34]

- The emergence of new business models that are based on the free flow of data and value being generated from sharing data rather than hoarding it. For example, OpenCorporates aggregates data for over 120m companies from sources including Companies House and makes it available to users as open data, free of charge, generating revenue from specific value-added services.

While there is a balance to be achieved between investing in sharing data and potential or perceived commercial losses from sharing, not exploring these trade-offs will mean data remains locked inside individual organisations and not available for use in new mobility solutions.

[33] Source: https://www.gov.uk/cma-cases/local-bus-services-market-investigation-cc
[34] Source: http://www.local.gov.uk/documents/10180/11655/York+Open+-Service+Directory+-+Breakthrough+Fund+Evaluation+July+2014+-+FINAL.pdf/b6c05976-2107-4765-b967-69746b05731c; http://www.harrow.gov.uk/info/100006/environment/1514/thermal_harrow; and http://www.local.gov.uk/documents/10180/7632544/Local+data-vores+workshop+-+Smart+Cities+and+Open+Data+Stephen+-Blackburn+Leeds+City+Council/da658de2-ac43-44af-ad32-25043948fc7f

CULTURAL BARRIERS

Many of the promises of IM are not of conventional improvements to the transport system - better roads, more convenient ports - but rather of better integration across different means of transport and with complementary aspects of a trip such as payment systems, insurance, entertainment, accommodation, etc. This means those involved in the use and re-use of shared transport data will not just come from the 'traditional' transport sector, but from wider afield, as shown below.
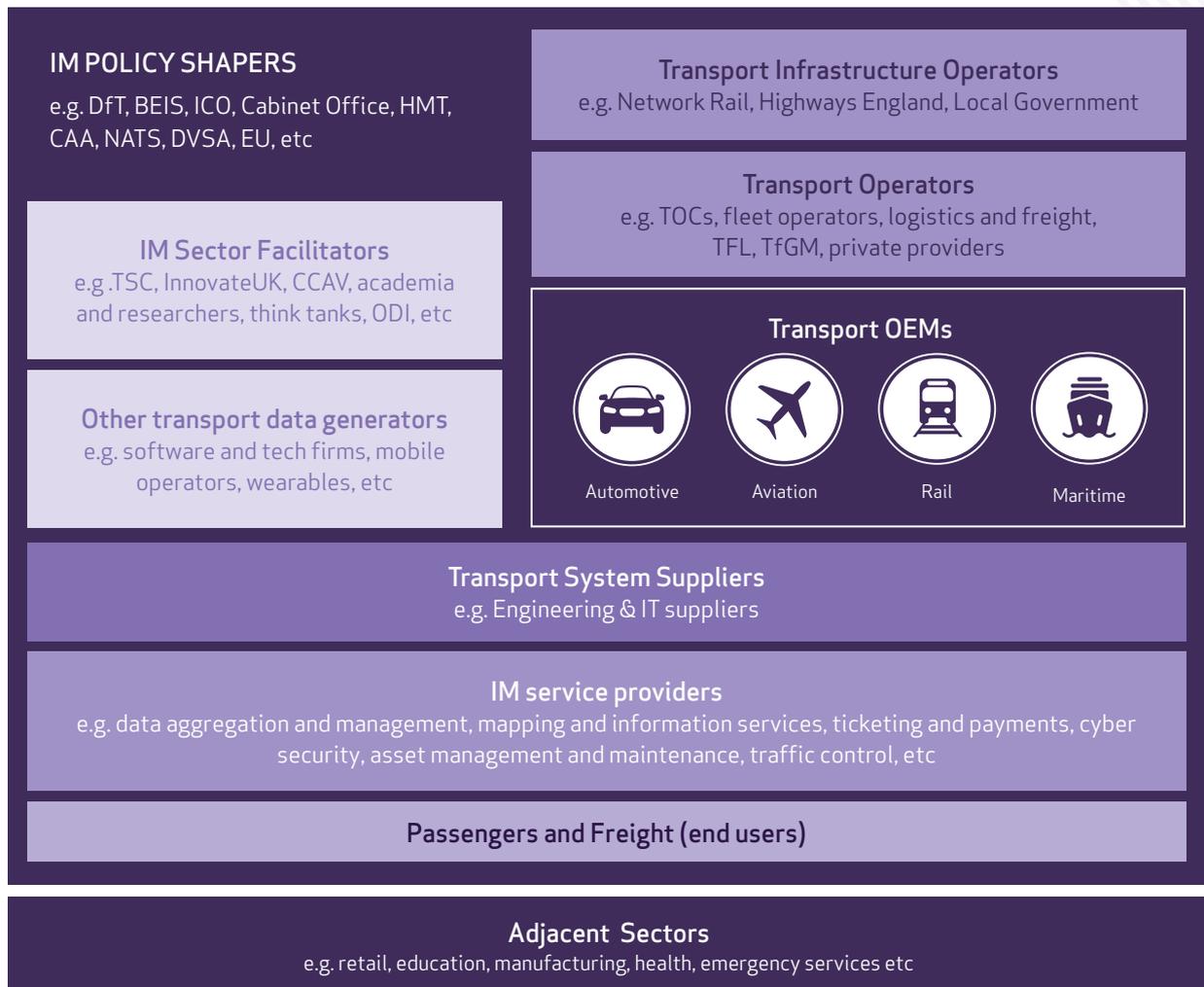

FIGURE 9: IM participants involved in generating, using and re-using transport data

Our discussions with stakeholders reveal many organisations involved in transport infrastructure, operations and manufacture (OEM) continue to focus only on their own mode of transport and do not think beyond their own transport segment (the coloured boxes in Figure 9) to share data with other IM participants.

The reasons behind these cultural disincentives to share data include:

- Organisations' internal structures being siloed between transport modes fostering a way of thinking that emphasises single modes of transport rather than holistic mobility solutions.

- An attitude held by some data owners that to be able to use data, one has to have worked in, or have a deep understanding, of that particular transport mode.

- A fear that sharing data that is less than 'perfect' may reflect badly on the organisation or data owner.

Exacerbating these barriers is the ongoing shortage of data literacy skills to effectively use and re-use data to maximise its benefits.

These barriers have been tackled elsewhere and can be addressed through strong leadership affecting institutional change. The example of #OpenDefra is instructive. The then Secretary of State set the challenge for the department to release 8,000 open datasets.[35] By putting senior leadership momentum behind the challenge and sustained focus, the department was able to exceed its target by 3,000 datasets and shift cultures within the department towards holistic working. Further, the sharing and publishing of data allowed the department to break down siloes and connect its work with activities in other sectors as diverse as urban planning, software development, emergency responses and agriculture. For example, the opening of datasets on bathing water quality and flood risks led to the development of a range of new apps. The release of archive LIDAR digital elevation models have been exploited to find 'lost' Roman roads, identify field boundaries for land management, and determine the ideal rooftop locations for solar panel placement.[36]

Without shifting cultures in the transport sector, services and data will continue to be structured along separate modes creating duplication and inefficiencies.

THE CONSEQUENCES OF NOT IMPROVING DATA SHARING

Having spoken with the industry and understood the scope and speed of existing initiatives to improve data sharing, we believe allowing the status quo to persist will result in the UK not capturing the full expected benefits from new mobility solutions. The UK will fail to seize the opportunity, and other countries will forge ahead in building new transport services, businesses and jobs. The resulting transport provision will not be holistic or efficient.

| UK loses any first mover advantage in this sector | No open standards emerge, raising operating and switching costs | Reduced product and service development in the UK - no UK - specific mobility solutions | Transport silos persist | Organisations duplicate efforts to collect the same data |

FIGURE 10: Impact of not improving data sharing for UK plc

[35] Source: https://defradigital.blog.gov.uk/2015/06/25/opendefra/
[36] Source: https://defradigital.blog.gov.uk/2016/03/17/exploring-the-laser-cloud/

As Figure 10 notes, not improving data sharing risks the UK failing to build on its strong foundations in IM and its wider leadership in open data. The UK will not be in a position to lead the development of new disruptive technologies.

More specifically, our modelling suggests that "doing nothing" will result in lost savings from more congestion, more accidents, more emissions and less efficient use of freight capacity that could result in an opportunity cost of over £15bn to the period 2025.[37]
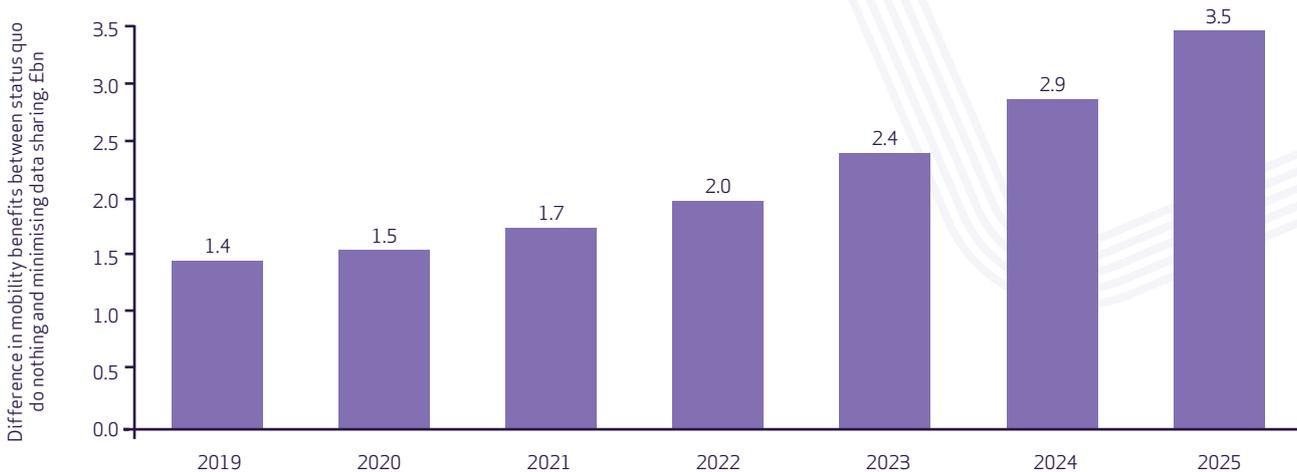

FIGURE 11: Annual difference in mobility solutions benefits between "do nothing" and optimal data sharing in the UK

As Figure 11 shows, from 2019 there is a significant difference in the value of benefits arising from mobility solutions in the UK between "do nothing" and improving data sharing.[38] This gap in the value of benefits will widen over time as new mobility solutions are prevented from coming to market because data is not shared and those solutions that are rolled out in the UK are sub-optimal and not specifically designed for the UK.

[37] See methodological appendix for more details of assumptions.

[38] 2019 is the first year of divergence between benefits arising from 'do nothing' and 'improved data sharing' in our model, based on discussions with industry.

RECOMMENDATIONS TO GOVERNMENT

We are recommending five actions for government to implement to support industry improve data sharing and publication.

THE CASE FOR GOVERNMENT INTERVENTION

The challenges to sharing data in the transport sector can be solved. Examples from sectors as diverse as banking, retail, agriculture and the public sector highlight a number of routes to improving data sharing. In a number of cases, this has involved government intervention in the form of industry leadership and coordination, policy guidance, legislative change or fiscal support.

Having heard from a range of industry participants and considered analogous sectors, we believe there is a strong case for government to intervene to improve data sharing in transport. Specifically:

- The government is already a major stakeholder in the transport sector – from setting regulatory frameworks to funding transport infrastructure projects to direct provision of services, it is uniquely placed to take a holistic system-wide viewpoint and use policy and fiscal levers to improve outcomes for passengers and businesses.

- The industry needs help to coordinate initiatives across transport siloes and is looking to a neutral body to provide guidance on how to share in a way that complies with new and existing regulations.

- The low levels of data sharing are an example of a prisoners' dilemma where the overall outcome of better mobility solutions for society will be maximised only if data is shared between organisations. Without guidance and certainty provided by government on being able to share safely, organisations may continue to be incentivised not to share.

- IM can play an important catalysing role in delivering the government's Industrial Strategy. Supporting its IM's growth continues on from initiatives around addressing congestion, supporting driverless cars and new data analytics skills announced in the 2017 budget.

- The government already has a track record in addressing market failure in the shape of misaligned incentives and insufficient provision of data through its open data agenda.

Internationally, other countries' governments are taking steps to support their domestic transport industries to take the lead in new mobility solutions, often allied to smart cities initiatives. From the UAE to Singapore to China to the United States, policies are being put in place that will attract new investment and seek to capture a share of the forecast £900bn global market.[39] The UK government must work with industry to solve data challenges if the UK is to secure the full benefits of new mobility solutions and not fall behind.

[39] See for example: Dubai To Put Autonomous Taxi Drones In The Skies 'This Summer', February 2017 https://www.forbes.com/sites/parmyolson/2017/02/14/dubai-autono-mous-taxi-drones-ehang/#31a005fa4702 or World's First Self-Driving Taxis Debut in Singapore, August 2016, https://www.bloomberg.com/news/articles/2016-08-25/world-s-first-self-driving-taxis-debut-in-singapore or Designed in China, http://www.bbc.co.uk/programmes/b07v0zhl

OUR RECOMMENDATIONS TO GOVERNMENT

We are asking government to work with industry to create the conditions that will support cultural change across the industry to share more data and make more data open.
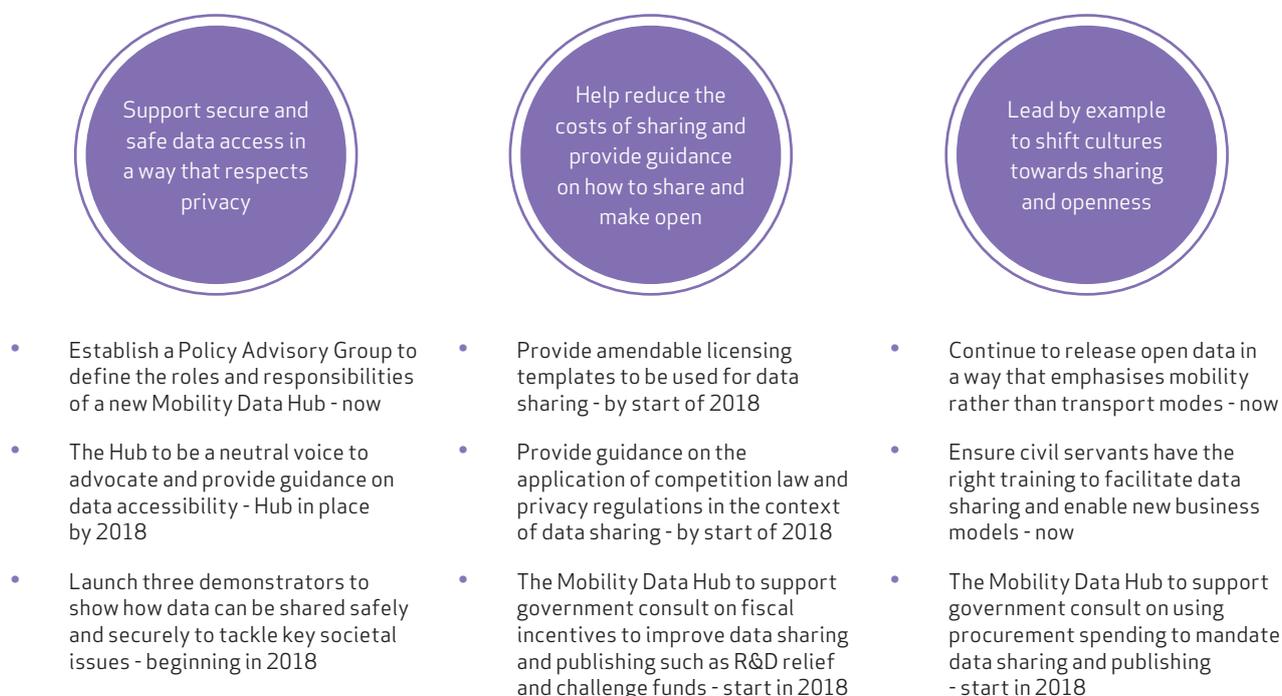
Support secure and safe data access in a way that respects privacy

Help reduce the costs of sharing and provide guidance on how to share and make open

Lead by example to shift cultures towards sharing and openness

- Establish a Policy Advisory Group to define the roles and responsibilities of a new Mobility Data Hub - now

- The Hub to be a neutral voice to advocate and provide guidance on data accessibility - Hub in place by 2018

- Launch three demonstrators to show how data can be shared safely and securely to tackle key societal issues - beginning in 2018

- Provide amendable licensing templates to be used for data sharing - by start of 2018

- Provide guidance on the application of competition law and privacy regulations in the context of data sharing - by start of 2018

- The Mobility Data Hub to support government consult on fiscal incentives to improve data sharing and publishing such as R&D relief and challenge funds - start in 2018

- Continue to release open data in a way that emphasises mobility rather than transport modes - now

- Ensure civil servants have the right training to facilitate data sharing and enable new business models - now

- The Mobility Data Hub to support government consult on using procurement spending to mandate data sharing and publishing - start in 2018

FIGURE 12: Recommendations to improve data sharing in transport

1.   ESTABLISH A NEW MOBILITY DATA HUB

Establishing a new Mobility Data Hub can contribute to breaking down all three sets of barriers identified. Through its pathfinder projects it will showcase the benefits of data sharing by providing industry and government with tangible use cases of how diverse stakeholders can collaborate and share data to solve challenges together and bring to market new solutions. It can lead and work with industry to develop open standards and technical guidance to address privacy concerns. Supporting government consultations fiscal incentives and procurement changes will also shift incentives towards sharing by default.

We recommend that government immediately constitute a Policy Advisory Group comprised of representatives from across the transport sector (all modes of transport), freight and logistics firms, passenger groups, academia and local and national government to work together to draft terms of reference for a new Mobility Data Hub. These terms of reference would focus on how the new body can best use the resources of government to address the biggest challenges around data sharing and areas to explore to build up use cases of data sharing.

To minimise costs, this new Mobility Data Hub could be part of an existing sector organisation given new functions. We believe this Hub should be established and operational by early 2018. The mission of the new Mobility Data Hub would be to act as a neutral voice improving data sharing (and data publication) in order to facilitate the development of new mobility solutions that contribute to economic growth and tackling social challenges. It would be a pro-active body able to break down siloes and take a national, industry-wide view.

In its first six months of operation, we recommend the Mobility Data Hub launch three pathfinder projects to demonstrate how data can be used to solve different societal and economic challenges. The purpose of these pathfinders would be:

- To provide industry with a tangible example of how data can be shared in a way to mitigate privacy, security and safety concerns.

- To showcase how diverse stakeholders can come together and share data to build holistic mobility solutions and break out of siloes.

- To accelerate the route to market for new mobility solutions that improve passenger and business outcomes.

The three pathfinders could cover the use of transport data to solve challenges such as urban congestion, accessibility of services in rural areas and freight optimisation.

As well as delivering three pathfinders, the Mobility Data Hub would act as a focal point for industry to share best practices, for example on building in security-by-design and the implementation of new technologies. The Mobility Data Hub could also negotiate conditions for group access to lower barriers for SMEs where appropriate. The Hub should also become a repository of case studies that can be used to further advocate data sharing.

To address cost barriers, the new Mobility Data Hub should also help government to consult on the appropriateness of new fiscal incentives to support industry making data accessible such as R&D tax incentives or challenge funds. To further shift cultures towards sharing by default, it should help government consult on how public procurement requirements on organisations receiving public funds to deliver mobility services could be changed to mandate openly publishing or sharing data. These consultations could begin in 2018, with a view to implementing changes by 2020 or sooner.

The Mobility Data Hub should also continually review levels of data sharing to 2020 and beyond and, if appropriate, argue for more interventionist approaches such as legislation if levels of sharing remain too low.

2. DEVELOP AND PUBLISH AMENDABLE CONTRACTS AND LICENSING TEMPLATES

Publishing amendable contracts and licensing templates will contribute to improving sharing and accessing data, breaking down cost barriers to sharing.

To reduce the costs of access for transport data from UK- or Europe-based data holders, the government should produce easy-to-use templates to licence data from data holders. These templates could cover issues such as ownership, use conditions and revenue sharing. Their use could provide SMEs with a much quicker route to accessing and combining data, without the need for long negotiations, relying on industry-standard agreements covering a variety of uses (from experimental research to full commercial use).

This quick win should be completed by the start of 2018.

3. PROVIDE GUIDANCE ON HOW DATA CAN BE SHARED OR MADE OPEN BETWEEN ORGANISATIONS WITHOUT BREACHING COMPETITION LAW OR NEW PRIVACY REGULATIONS

Providing guidance on how competition law and privacy apply to transport data will contribute to increasing certainty and giving industry greater confidence to share.

To provide some certainty on how data can be shared without falling foul of competition law or breaking new GDPR regulations, the government should provide short guidance documents on the ways data can be shared safely, specifically in the transport sector. These documents could be drafted by the Competition Markets Authority and the Information Commissioner's Office.

This quick win should be completed by the start of 2018.

4. CONTINUE TO PUBLISH OPEN DATA IN A WAY THAT FOCUSES ON THE FULL PASSENGER AND FREIGHT JOURNEY RATHER THAN INDIVIDUAL TRANSPORT MODES.

Shifting towards a position where transport data is made available in a way that emphasises mobility can help reduce the costs of combining datasets, but more importantly, it will break down siloes between transport modes showcasing the importance of thinking about the complete end-to-end journey.

The government has an opportunity to take the lead in moving away from traditional transport siloes towards thinking about mobility and the data flows that will enable this. To this end, when publishing data it should do so in a way that does not focus on individual transport modes like cars, motorcycles, trains, bicycles, etc., but rather on the full end-to-end journey in order to create an understanding of the entire mobility process.

The Mobility Data Hub could work with the Office for National Statistics and Department for Transport to advise on new mobility definitions and measures.

5. ENSURE CIVIL SERVANTS INVOLVED IN MOBILITY HAVE THE RIGHT TRAINING TO UNDERSTAND THE IMPORTANCE OF SHARED AND OPEN DATA AND HOW NEW ECOSYSTEMS AND BUSINESS MODELS ARE FACILITATED BY THIS.

Having a strong understanding of how data can be used to build new solutions and underpin innovative business models can further encourage a shift towards open sharing cultures.

Building on current initiatives to improve data literacy and the government's Digital Academy, we recommend that civil servants involved in mobility have the right skills and level of understanding to be able to promote data sharing and new business models.

LAST WORD

Getting shared data right can help the UK become a world leader in mobility solutions and act as a catalyst for economic growth and wider social benefits. The aggressive timelines for our recommendations reflect the need to act now to maximise the benefits and enjoy them as soon as possible. The Transport Systems Catapult will be engaging in an advocacy strategy to ensure these recommendations are enacted.

CATAPULT
Transport Systems

THE CASE FOR GOVERNMENT INVOLVEMENT TO INCENTIVISE DATA SHARING IN THE UK INTELLIGENT MOBILITY SECTOR

BRIEFING PAPER

March 2017

CATAPULT
Transport Systems