The Transport Systems Catapult (TSC)

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Visibility is key to improving service and efficiency

- Through data collection and analytics
- Modelling and then visualising solutions
  - Improving the customer experience
  - Automation?
  - Collaboration and data sharing

...INTELLIGENT MOBILITY!

The Transport Systems Catapult is here to help...
Huge Growth Potential for Intelligent Mobility

- Customer experience - £500bn
- Autonomous systems - £81bn
- Environment & resilience - £94bn
- Modelling & visualisation - £15bn
- Information Exploitation - £98bn

TSC Target 10% of...
‘Drive UK global leadership in *intelligent mobility*, promoting sustained economic growth and wellbeing, through integrated, efficient and sustainable transport systems’.

‘Create an environment that will make the UK a World Leader in Transport Innovation.’
UK approach to Innovation

The Catapults are national resources which will reach out and build strong relationships with organisations and institutions right across the UK. Just get in touch with the programme or the individual Catapults:

- High Value Manufacturing
- Cell Therapy
- Offshore Renewable Energy
- Satellite Applications
- Connected Digital Economy
- Future Cities
- Transport Systems
- Precision Medicine
- Energy Systems

- Glasgow
- Strathclyde
- Wilton/Sedgefield
- Rotherham
- Coventry
- Ansty
- Bristol
- Milton Keynes
- Harwell
Bridging the gap - developing a translational infrastructure

Invest in research excellence

Develop a translational infrastructure

Target areas of UK industrial potential
• Five-year core grant of £46.6 million from the Innovate UK (formerly Transport Strategy Board)

• We aim to generate £712 million of linked economic value within the same period, comprising
  • This comprises £66 million of additional contributions from commercial and collaborative partners in TSC projects
  • £454 million of direct economic benefits as a result of TSC activities
  • £193 million of wider economic benefits as a result of TSC
  • investigate further opportunities to invest and exploit the huge market in intelligent transport systems.
The Transport Systems challenge

Increase ‘mobility’:

*defined as the efficient and cost-effective movement of goods and people*

Constraints on land and investment mean that the only way to overcome this challenge is to work *intelligently* – in a coordinated and collaborative way – to develop improved transport systems that unlock latent capacity.

The vision and strategy of the Transport Systems Catapult (TSC) is a direct response to explicit demands from business, academia and government.
Integrate the infrastructure, vehicles, information and communication systems that enable movement of goods and people.

Unify the Transport Sector relationships between organisations that develop, deliver and use transport

- delivering a portfolio of innovation projects
- connecting platforms and infrastructure (we will build and run large-scale technology-based modelling facilities
- leading thought in Intelligent Mobility
- creating and running an Innovation Centre - world-class hub for people, systems and ideas

- communicating and engaging with our stakeholders
- build and manage an agile organisation with significant depth of expertise.
Autonomous vehicles

- Demonstrator – Low-Carbon Urban Transport Zone (LUTZ):
  - Demonstrating on a large scale the potential of autonomous vehicles, cloud-enabled mobility and transport on-demand services
    - £50 million programme
    - Milton Keynes as the test-bed
    - TSC £5 m + EU £5 m: to deliver key projects within the programme and help develop and implement standards and protocols for autonomous vehicles.
Departure Planning Information (DPI)

- Real-time flight departure technology at airports across the UK
- In cooperation with the Civil Aviation Authority (CAA) and the National Air Traffic Services (NATS), integrated with the European flight information network EuroControl
- TSC contribution: £750,000 for building the project team
Innovation in rail franchising

- TSC and partners:
  - DfT, Future Railway, the Rail Safety Standards Board and the National Skills Academy for Rail Engineering within the Innovation in Rail Franchising group
  - Franchise agreements have the inclusion of specific innovation requirements
  - TSC has devised a new Innovation Strategy to ensure that innovation remains a permanent priority within the franchise system
  - a major new innovation fund as part of the franchising process to stimulate new investments in innovation
The Manchester table

- A touch-screen controlled simulator
  - an interactive display based upon the transport system of central Manchester
  - Using historical data from 2010, as well as projected figures for the years 2020 and 2030
  - the table allows users to increase the level of interconnectedness between the different modes of transport, as well as introducing individual "interventions" (such as road closures, bad weather or the introduction of Park and Ride schemes)
- The concept will be developed for other modelling and visualization initiatives within projects
Modelling and Visualisation demonstrators
Sentiment mapping

• Examining how social media and crowd-based sentiment mapping applications can be used to the mutual benefit of transport providers and transport users.

• Monitoring the moods of public transport passengers in real time

• Identifying blackspots *before incidents* happen

• Exploring the financial and social rewards that can be unlocked by embracing these popular new technologies.

A demonstration version of the project can already be seen in the form of a giant live data projection currently on display in our Imovation Centre, with a series of "real world" pilot schemes
SISTALS (Solutions for Integrated Seamless Transport Across Land and Sea)

- To ease pressure of congestion on ports and hinterland road network
- Completed a feasibility study to demonstrate the value of a fully integrated vehicle and freight tracking system that could be used to increase fuel efficiencies and reduce the impact of congestion, whether at sea, in ports or on the road – with the scope to also consider rail freight in the future.
- Put forward a series of possible solutions and improvements including prototype equipment and innovative web-based services
  - (Subject to funding approval) due to be tested in a major In-Field trial that will help to demonstrate readiness for application in the "real world"
# Data related trends in the Intelligent Mobility market

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<tr>
<th>Section</th>
<th>Description</th>
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| **Free the Data**                            | • Open data  
• A new data source from Building Information Modelling  
• Sharing of personal data on social media platforms will establish an online identity for users                                                                                                                                                                                     |
| **Digital Power**                            | • Security of personal and business systems is a concern  
• The online market shifts away from younger people towards the older generation - important online consumer group                                                                                                                                                                                                                   |
| **Intelligent Infrastructure**               | • Smart Infrastructure from home through transport to smart cities becoming BAU  
• Cities, organisations and companies not exploiting data are left behind  
• Machine learning will become significant                                                                                                                                                                                                                                        |
| **Customer Experience: The Next Level**      | • Technology driving up the minimum standards expected of customer services  
• Real-time data on operations is an expected minimum - customers will go to third parties as a means of verification of information, e.g. sentiment mapping                                                                                                                                 |
| **The New Transport Economy**                | • Technology and data analytics provide competitive advantage  
• Companies will need to be driven not just by operations but by their own and open data  
• Companies will open up their platforms to enable collaboration and user-generated products                                                                                                                                                                                                          |
Potential intervention points in the data transport market

Transport Data Integration & Management
Market provides analytical capability to continue to serve ITM* and APIS** markets. Value and insight will be in analysis and integration of datasets from both of these markets, and application of current analytics and machine learning to this data.

Transport Data Analytics
Main innovation in data analytics generally is likely to be machine learning. But adoption of data analytics methods in transport will continue to lag behind the market, with aviation and automotive adopting them in the first instance.

Transport Open Data
Open Data agenda will continue to be driven by Government through the Cabinet Office. Transport data will continue to be released and data quality will slowly improve. Some companies may released data as trials or where business case is proven.

Smart Infrastructure
BIM*** will be a rich new data source from major schemes, although data release likely to be patchy. Sensors will deliver data that is only likely to be utilised by the infrastructure providers.

So what?
• Without intervention, data analytics and integration will continue to develop but practice within transport will lag behind
• Integration of data from ITM* and APIS** markets (i.e. fusion of operations and customer data across industries) is likely to happen and will provide a competitive advantage for early adopters
• Open data will underpin innovation in transport but will also raise issues around security and privacy
• New data-driven business models will be required in order to enable improved services in transport and to significantly grow the market size

* ITM – Integrated Transport Management
** APIS – Advanced Passenger Information System
*** BIM – Building Information Modelling
## 5 Critical Success Factors

**How will we know if we have been successful?**

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<thead>
<tr>
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<th>Success Factor</th>
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<tr>
<td><strong>GROWTH &amp; JOBS</strong></td>
<td>Grow and create Intelligent Mobility businesses for the UK</td>
<td>We exist to grow businesses, drive the creation of new products and services, and increase jobs. We work with any business including SMEs generating growth or jobs for the UK.</td>
</tr>
<tr>
<td><strong>GLOBAL SUCCESS</strong></td>
<td>Increase UK share of the global market for Intelligent Mobility &amp; attract inward investment</td>
<td>We support businesses to increase the overseas take-up of their products and services. Economic value to the UK is derived from sales and licensing of Intelligent Mobility systems and from UK employees delivering services overseas.</td>
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<tr>
<td><strong>IMPROVED JOURNEYS</strong></td>
<td>Improve the integration, efficiency and sustainability of transport systems</td>
<td>We will drive the introduction of transport systems for Intelligent Mobility, attracting innovators to develop new approaches to seamless journeys. We will improve the efficiency and sustainability of transport, cutting congestion and emissions, reducing travel times and improving reliability and safety.</td>
</tr>
<tr>
<td><strong>THRIVING ORGANISATION</strong></td>
<td>Deliver our business plan</td>
<td>We will be a thriving and successful organisation that delivers on its promises. Our 5 Year Business Plan shows the steps we will take to build and grow the business and how we will achieve a return on investment.</td>
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<tr>
<td><strong>WORLD-LEADER</strong></td>
<td>Be recognised as a centre of excellence for Intelligent Mobility</td>
<td>We will be the first port of call for businesses seeking to develop and deploy transport systems for Intelligent Mobility. We will help the UK to become renowned as a world-leader in this market.</td>
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Where are the opportunities?

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Engineering to accommodate intelligent mobility
Thank You