The future of transport
Societal trends

- Mega-trends
  - Ageing population
  - Urbanisation
    - “reverse” urbanisation
  - Climate change
    - Public attitudes, interventions
    - Resilience, impact
  - (Backlash against) Globalisation
  - Austerity

- Consumer expectations
  - Personalisation
    - Hygiene factors
    - Luxury factors
  - Immediacy
    - In-flight changes
    - Just-in-time manufacturing
    - Same-day delivery
  - Value added time
    - Work
    - Leisure
  - Conscious choice to travel
    - Remote working / meeting
    - Internet shopping
    - Virtual healthcare

Sector (particularly UK) shifting from product-led to service-led economy
The TSC will help companies to develop and validate their products and services helping them to grow.

- IM Accelerator
- SME Engagement
- Hackathons
- Demonstrator Projects
- Students & Researchers
- Accelerators / Incubators
- Consultants

TSC services

- Use case development
- Thought leadership
- Impartial Advice & neutral broker
- Insights & business model design
- Access to data
- Showcase for UK businesses
- Transport analytics
- Domain & capability expertise

Market needs

- Transport Operators
- Travellers
- Transport Authorities
- City Operators
- Local Authorities
- Regional Authorities
- OEM's
- Consultants

Innovation & ideas

New products & services
<table>
<thead>
<tr>
<th>Strategic focus areas</th>
<th>Thought leadership</th>
<th>Integrating silo’s</th>
<th>CR&amp;D</th>
<th>Neutral &amp; independent</th>
<th>Test &amp; demonstrate</th>
<th>Commercialisation support</th>
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<tbody>
<tr>
<td>Connected &amp; Automated Transport</td>
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<tr>
<td>New mobility services</td>
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<td>Open data platform</td>
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Connected & Automated Transport

• Automation:
  o Technological development is “easy problem”
  o Key areas for innovation:
    ▪ Role in the transport system (all modes, impact across modes, impact beyond transport)
    ▪ How to use them (HMI, adoption, business/usage models)
    ▪ Safety & security (provenance, testing & validation)
    ▪ Peripheral issues (impact on environment, on energy system)

• Connected vehicles
  o Increasingly seen as separate from automated vehicles. Connectivity is needed for:
    ▪ Beyond line of sight perception (V2V, V2I2V)
    ▪ System-level optimisation (C-ITS)
    ▪ Productive travel time (in-flight entertainment, working)
  o Key areas for innovation:
    ▪ Ownership of data generated by CVs and their users (incl. business models)
    ▪ Cyber security
    ▪ Connectivity use-cases (“enabling environments” piece)
New mobility services

- Use of assets decoupled from ownership
- Service accessed through marketplace
  - P2P, centralised
  - Monetary, sharing, barter
- Added value
  - Multimodal seamless ticketing
  - Personalisation
  - Productive travel time

Key areas for innovation are:
- Define value pools (what problem will customers pay to get solved?)
- Design new service models
- Create tools to test & validate new service models
- In-market trials

Customer:
- Passenger
- “Freight package”
Open data

- Transport data sets are large and very rich, but often not fit for sharing
  - Silo’d
  - Not cleaned
  - Format not standardised
  - Lack data scientist support for interpretation

- Key areas for innovation are:
  - Understanding the value of shared data (use cases, market opportunity)
  - Understanding the costs of data sharing, incl. privacy and security concerns
  - Business models / revenue sharing models
  - Improve understanding of data-driven business / operational models across organisations
    - Senior level – appreciate the benefits of data-driven solutions; use data scientists to their full capability
    - Implementation level – upskill workforce to adopt data-driven processes
  - Cross-modal data platform(s)
  - Impact on whole system (modelling, societal)
Future technologies

• “Known unknowns”
  o Hyperloop
  o Flying cars / personal drones
  o Hypersonic / suborbital flight
  o Distributed manufacturing + bulk materials delivery
  o Block-chain
  o Virtual tourism
  o Decarbonisation (electric, hydrogen, reduced use etc.)

• “Unknown unknowns”
## Opportunities for collaboration

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<td>Publish validated list of new business models enabled by technology</td>
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<tr>
<td>Create modelling tools for new mobility services</td>
<td></td>
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<tr>
<td>Create model architecture for new businesses</td>
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<td>Create national strategy for new mobility services</td>
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<tr>
<th>Economic and technical feasibility for commercial autonomous transport service</th>
<th>Autonomous passenger ferry trial frameworks</th>
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<td>Use of drones for remote asset condition monitoring</td>
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<td>Collate scenario library for CAV regulation</td>
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<td>Automated construction trials</td>
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<td>Develop and deploy CAV-data sharing infrastructure</td>
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<td>Identify market opportunity and value pool for shared data</td>
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<tr>
<td>Showcase UK data-based transport businesses</td>
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<td>Design data sharing platform(s)</td>
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<td>Develop strategy and pathfinder projects for use of AI in transport</td>
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**Jan 2018**

**Mar 2019**
TSC Skills and Capabilities

- **Systems Engineering**
  - Automation & Safety
  - Transportation
  - Freight & Logistics
  - Connectivity

- **Customer Experience**
  - Human Factors
  - Anthropometrics
  - Social Research
  - New & innovative business models

- **Transport Modelling**
  - Microsimulation
  - Strategic
  - Environmental
  - Economic

- **Data Science**
  - Software Development & Integration

- **Visualisation & Graphical Information Systems**
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