Transport Systems Catapult

The Clark Lecture
University of Birmingham, School of Civil Engineering

Steve Yianni
Chief Executive Officer
June 2014

Technology Strategy Board
Driving Innovation

CATAPULT

Thank you

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Catapults
A new force for innovation & growth

- Part of a **world-leading network** of technology and innovation centres
- **Bridge the gap** between businesses, academia, research and government
- Long-term investment to **transform** the UK's ability to create new products and services
- Open up global opportunities for the UK and **generate sustained economic growth** for the future
- Established and overseen by the **Technology Strategy Board**

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

£1bn
private and public sector investment

All Catapults up and running in **2013**

7
Catapults

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The Catapult Concept

- Large global markets worth billions of pounds per annum
- UK has technical leadership
- Capacity to anchor a significant part of the value chain, from research to manufacturing.
- Mission is to create wealth & jobs in the UK

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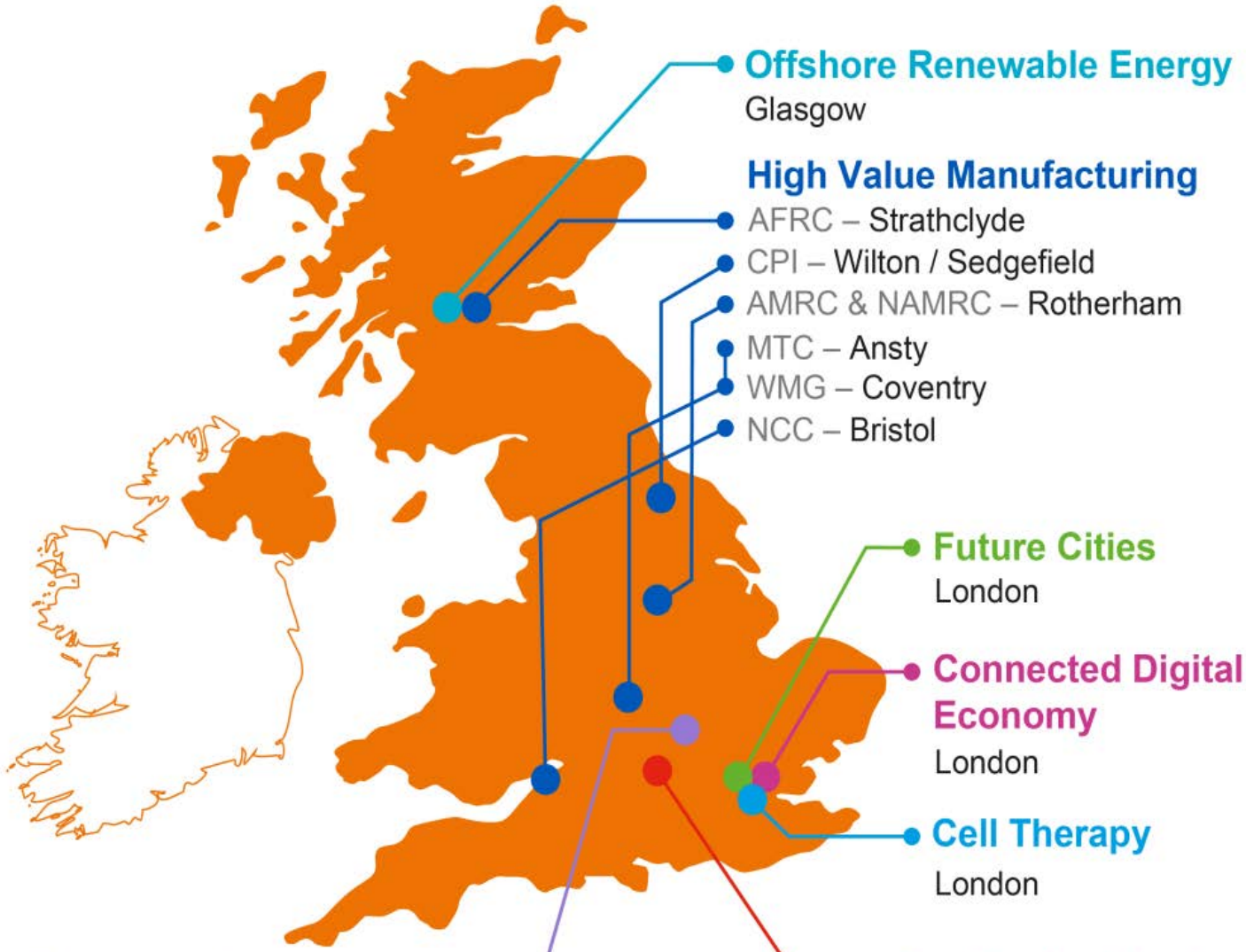
Catapult Locations



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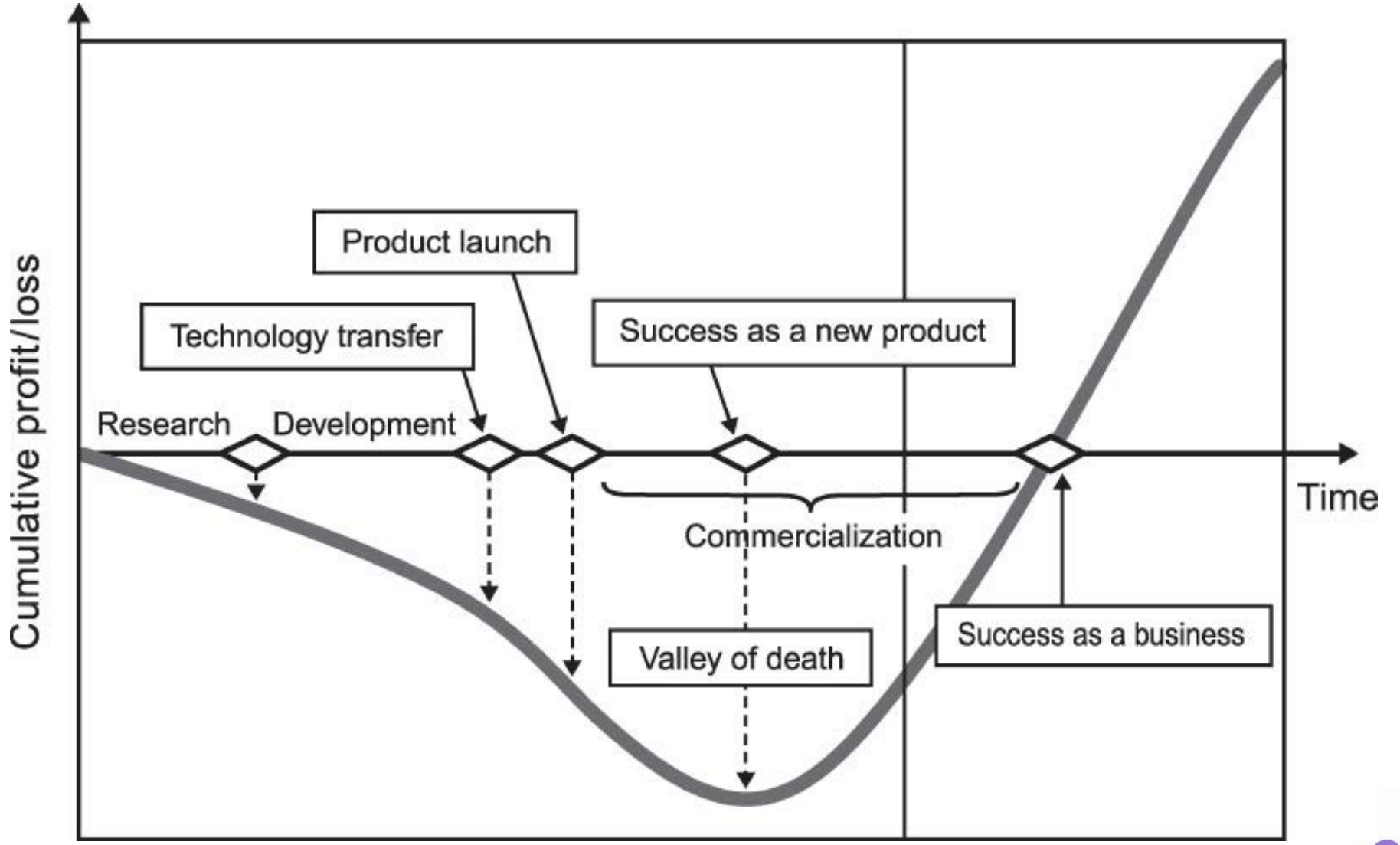
Avoiding the ‘Valley of Death’



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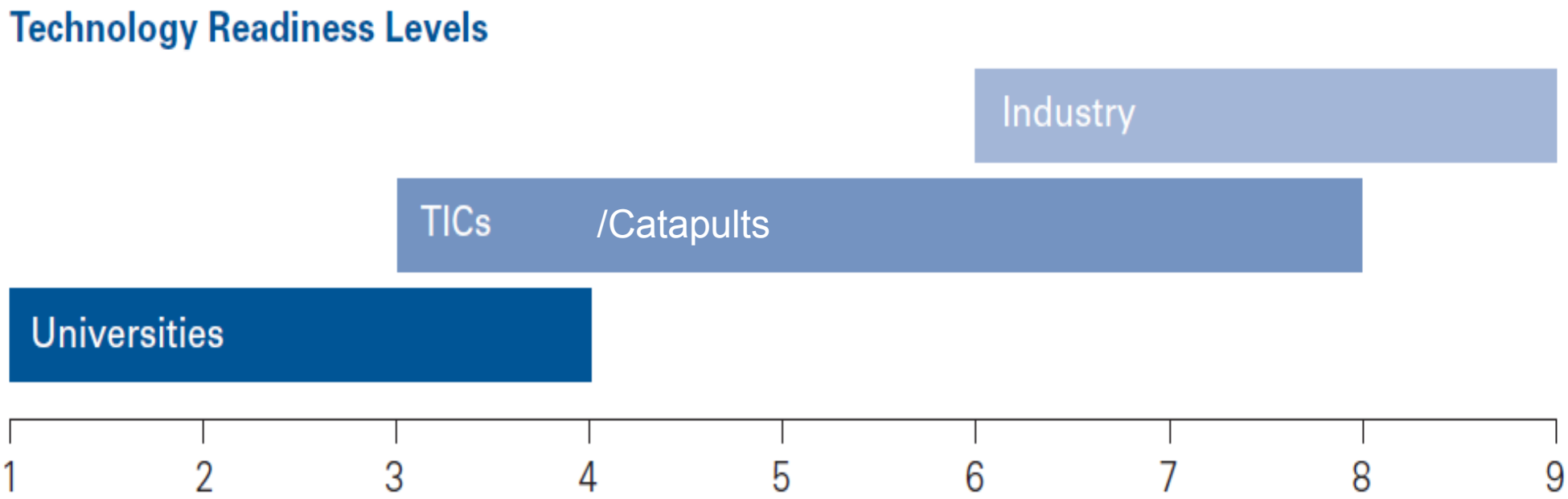
A Translational Infrastructure



Invest in research excellence

Develop a translational infrastructure

Target areas of UK industrial potential

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Innovation…….

‘Bringing Great Ideas to Commercial Reality’

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Transport Systems Catapult

*‘Drive UK global leadership in **intelligent mobility** promoting sustained economic growth and wellbeing through integrated, efficient and sustainable transport systems’*

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Why is Transport Important?

‘the UK’s ability to generate and sustain economic growth and jobs depends on the quality of our transport systems.’

ICE State of the Nation report 2014

- Key *driver* to the health and wealth of the nation
- Without transport, we would run out of most foods within seven days and energy within a few weeks
- Transport gets us to work, it ensures we can get the goods we need (and want).
- Transport enables us to live where we want, work where we can, enjoy our leisure

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Challenges……

- Population Growth (now – 2050)
  - World population currently 7.1bn will increase to 9.7bn
  - UK population will swell from today's 62.2 million to 77 million + 24%
  - Equivalent to combined populations of Glasgow, Birmingham, Manchester and Leeds
  - Bigger than France (70 million) and Germany (71.5 million)
  - Aging
- Congestion Costs
  - Excess delay is costing our urban economies £11 billion pa
  - This will increase to £22 billion pa by 2025
- Energy Consumption
  - Transport: 36% of total consumption of UK energy products 2012.
  - Rapidly Increasing Energy Costs: +46% projected 2013 – 2020
- Climate Change

Sources: US population Reference Bureau, UBS, DECC/National Statistics

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……..Opportunities

- Internet of Things/Internet of everything
  - 50 billion connecting things worldwide by 2020
- Semantic Web
- System of systems
- Connectivity
  - 74% of UK adults own a smartphone
  - Work while they travel
  - Visualisation

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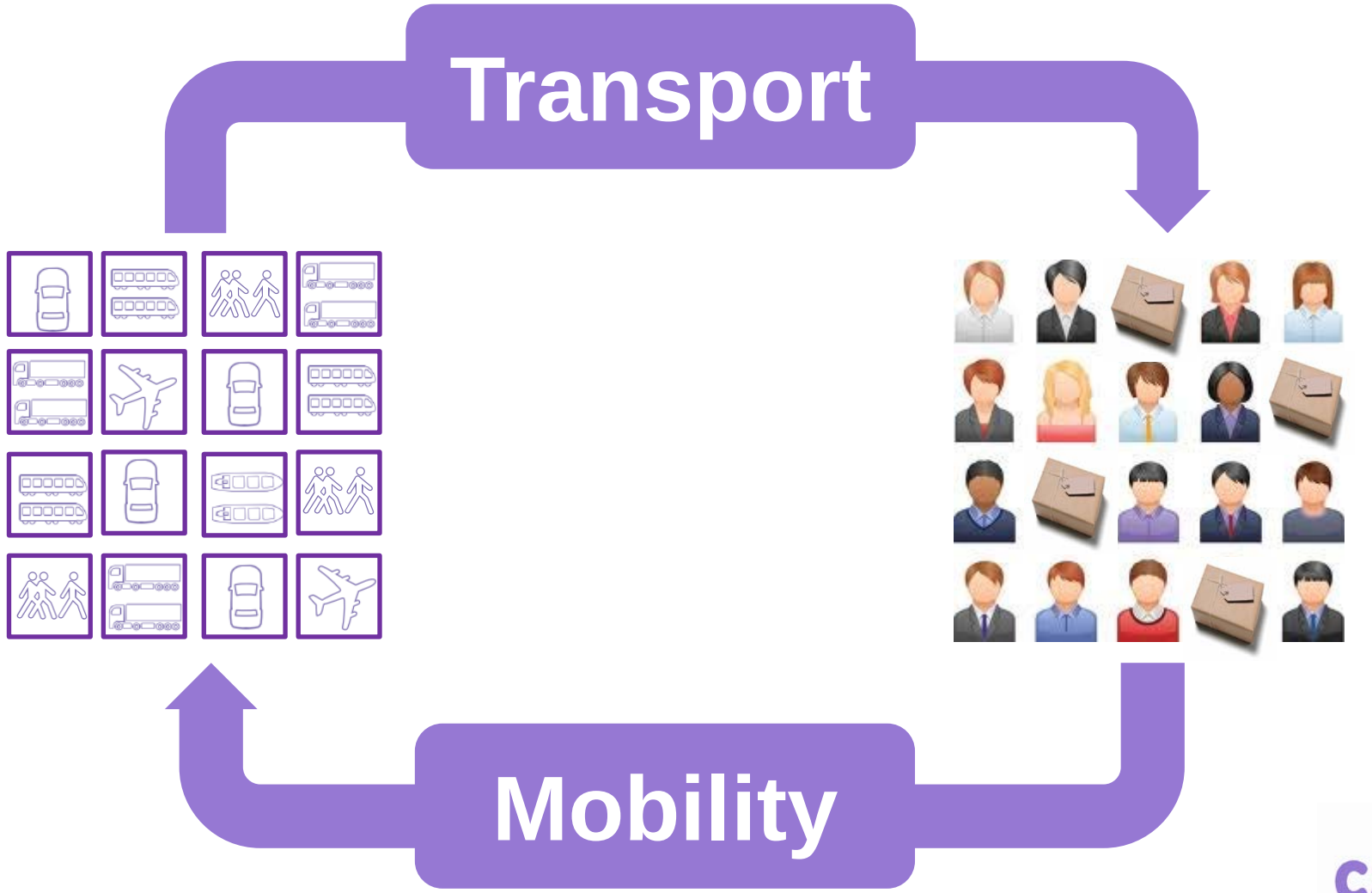
Transport vs Mobility



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Intelligent Mobility: the efficient and cost-effective movement of goods and people

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Drivers for Intelligent Mobility

- Transport Investment as a proportion of global investment
- Mega trends need to be addressed
- Current system is siloed, inefficient and unsustainable
- Need to deliver more for less (more of what the user needs for less impact on society and environment with a greater economic benefit)……..
- **User focused transport systems** - to meet the needs of an ever connected world and an aging population
- **Integrated transport systems** - to maximise the capacity of transport
- **Efficient transport systems** - to meet global resource demands
- **Sustainable transport systems** - to address global social, environment and economic risks, particularly climate resilience

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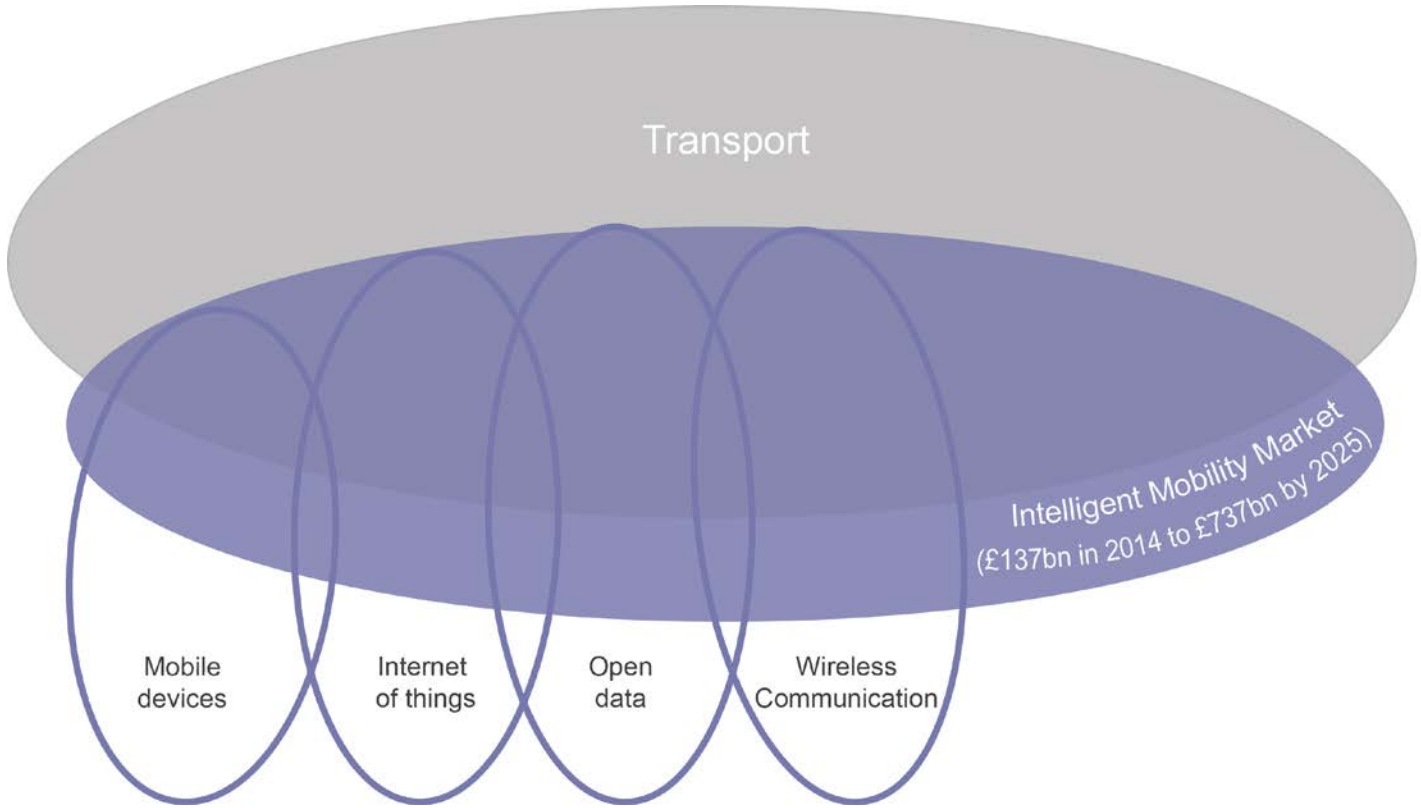
Intelligent Mobility

Cuts across and goes beyond the traditional transport sector. It utilises the emerging technological markets to enable user focused, integrated, efficient and sustainable transport systems.



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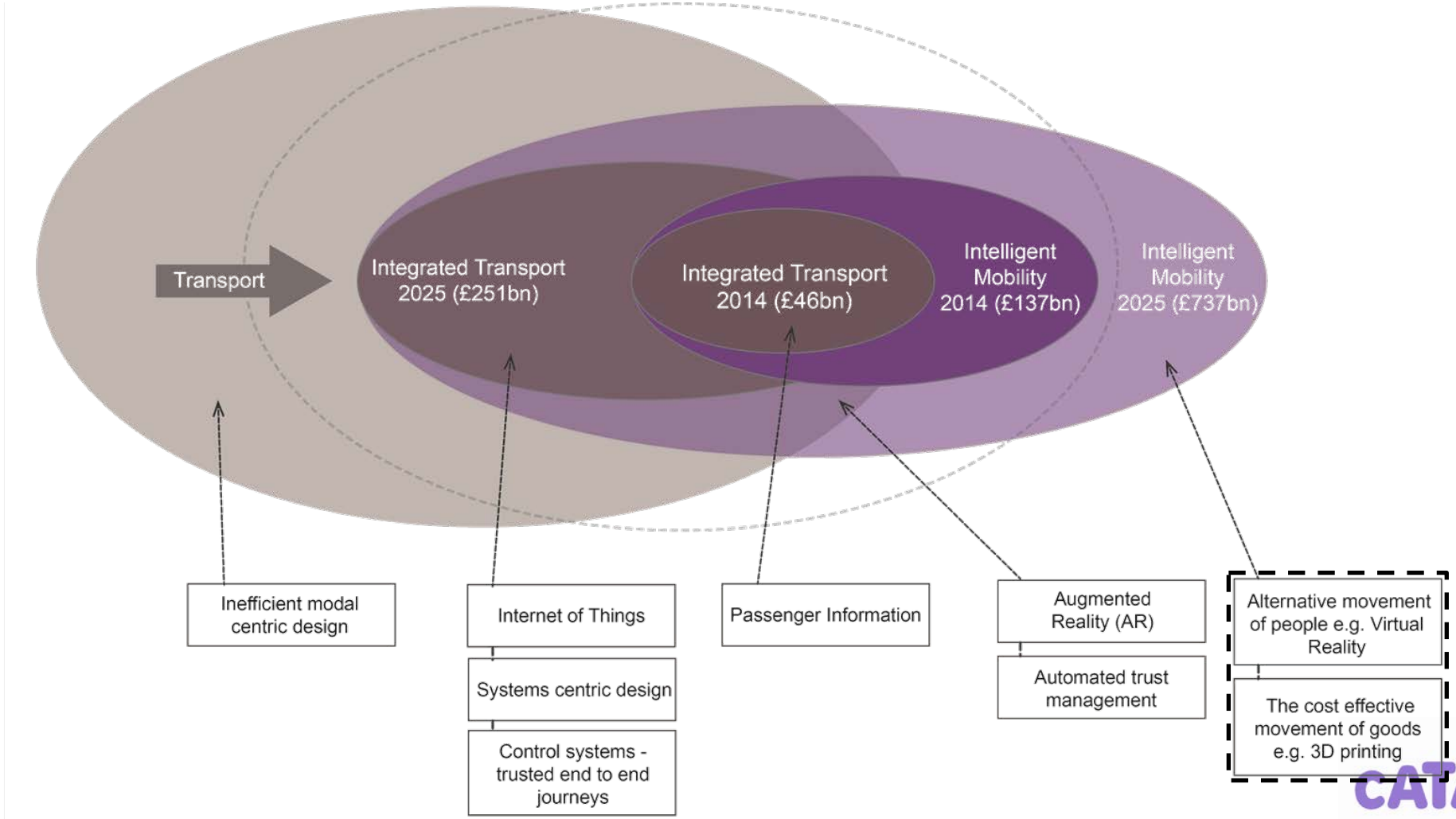
Intelligent Mobility: Market Trends



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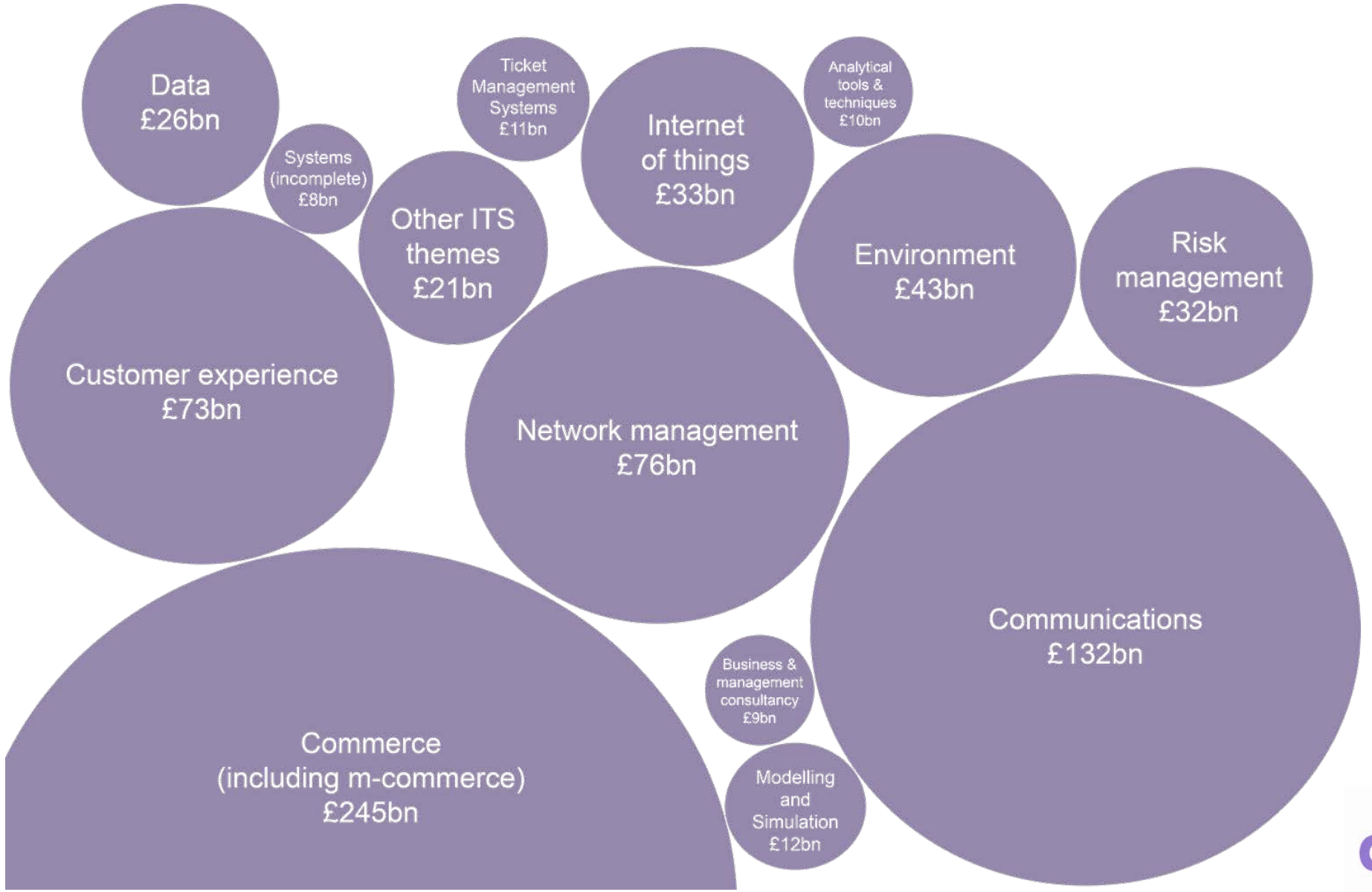
Intelligent Mobility - Capabilities



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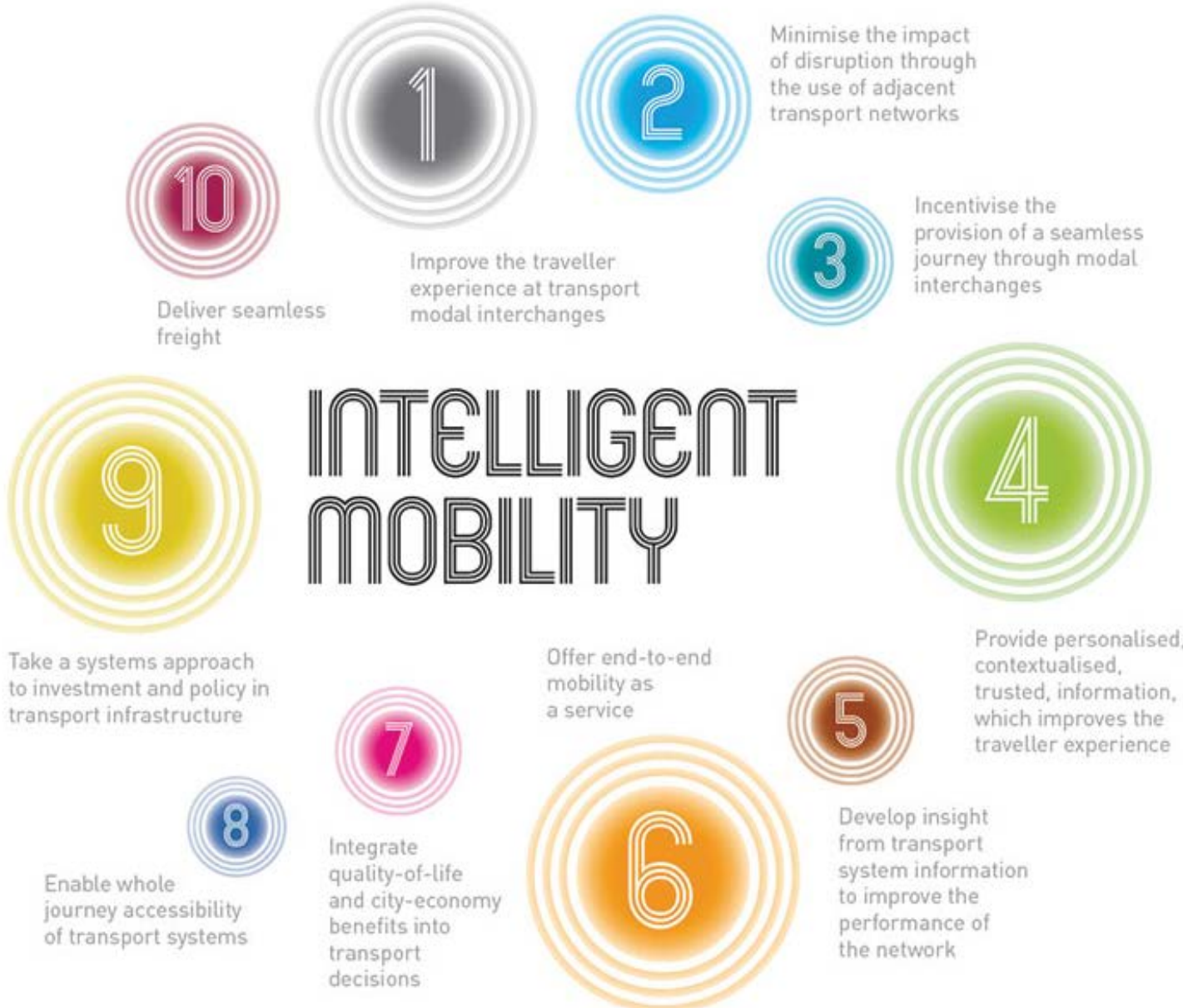

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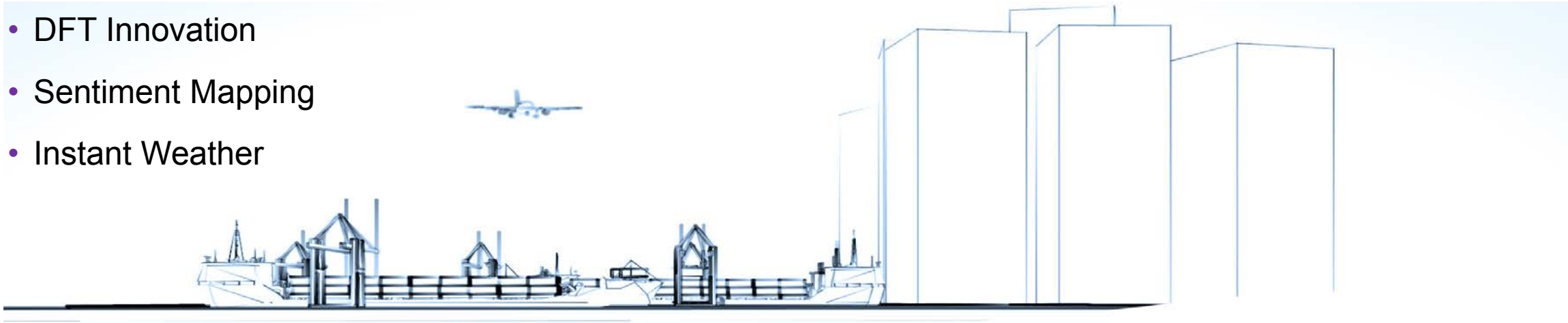
Our Work

- Building a world-class *Imovation* Centre
- Innovation Platforms
- LUTZ
- Departure Planning Information
- Customer Rail Experience
- DFT Innovation
- Sentiment Mapping
- Instant Weather



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LUTZ: Low carbon Urban Transport Zone

- Pod manufacture recently awarded to UK SME
- Lead discussion on Autonomous Vehicle Systems & Transport on Demand services
- Play a major role in the development and implementation of standards and protocols for autonomous vehicles
- Milton Keynes as a test bed
- Use Innovation Centre to connect organisations
- Provide a focus for research and development
- Use TSC platforms to test and model

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Sentiment Mapping

Sentiment Mapping in Transport

This new project will assess how sentiment mapping and analysis of publically available social media channels and crowd-based sentiment mapping applications can improve passenger experience in a variety of transport modes. It is a collaborative project between the Transport Systems Catapult, Commonplace, a social enterprise start-up, and the Royal College of Art, who are a world leader in the research and application of design led thinking.

Sentiment mapping provides a map-based visualisation of how members of the public respond to a location or situation. The data behind the map may be gathered from posts made on social media channels, or opinions expressed via a bespoke mobile phone app. Harvesting and analysis of this kind of data will help us understand how people react to a disrupted journey. If we can understand why people are affected by transport disruption then we can find better ways of planning, operating and using transport.

The outputs of the project will be a feasibility study and a business case of mapping the sentiment of users of transport, which could be potentially taken forward as a full demonstrator.

Potential benefits include:

- Highlighting transport problems before operational systems provide data
- Understanding what is important to people when travelling
- Making travellers feel that their views matter
- Managing transport disruption based on sentiment

COMMONPLACE

Royal College of Art
Postgraduate Art and Design

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Instant Weather

- Pilot project in North East supported by Sunderland Software City, Connected Digital Economy Catapult, Met Office and Transport Systems Catapult & SME Community
- Pilot project providing foundations for a wider scale National Project role out and support National Transport Modelling Facility
- Combining real time weather and environmental hazard information with transport and logistical information for decision making and new services and applications
- Generating innovation and enterprise in the field of open data across digital economy, transport, weather and logistics
- TSC will provide transport organisations with real user challenges and issues that can be addressed to improve better integrated transport

Met Office

CATAPULT Connected Digital Economy

Sunderland Software City

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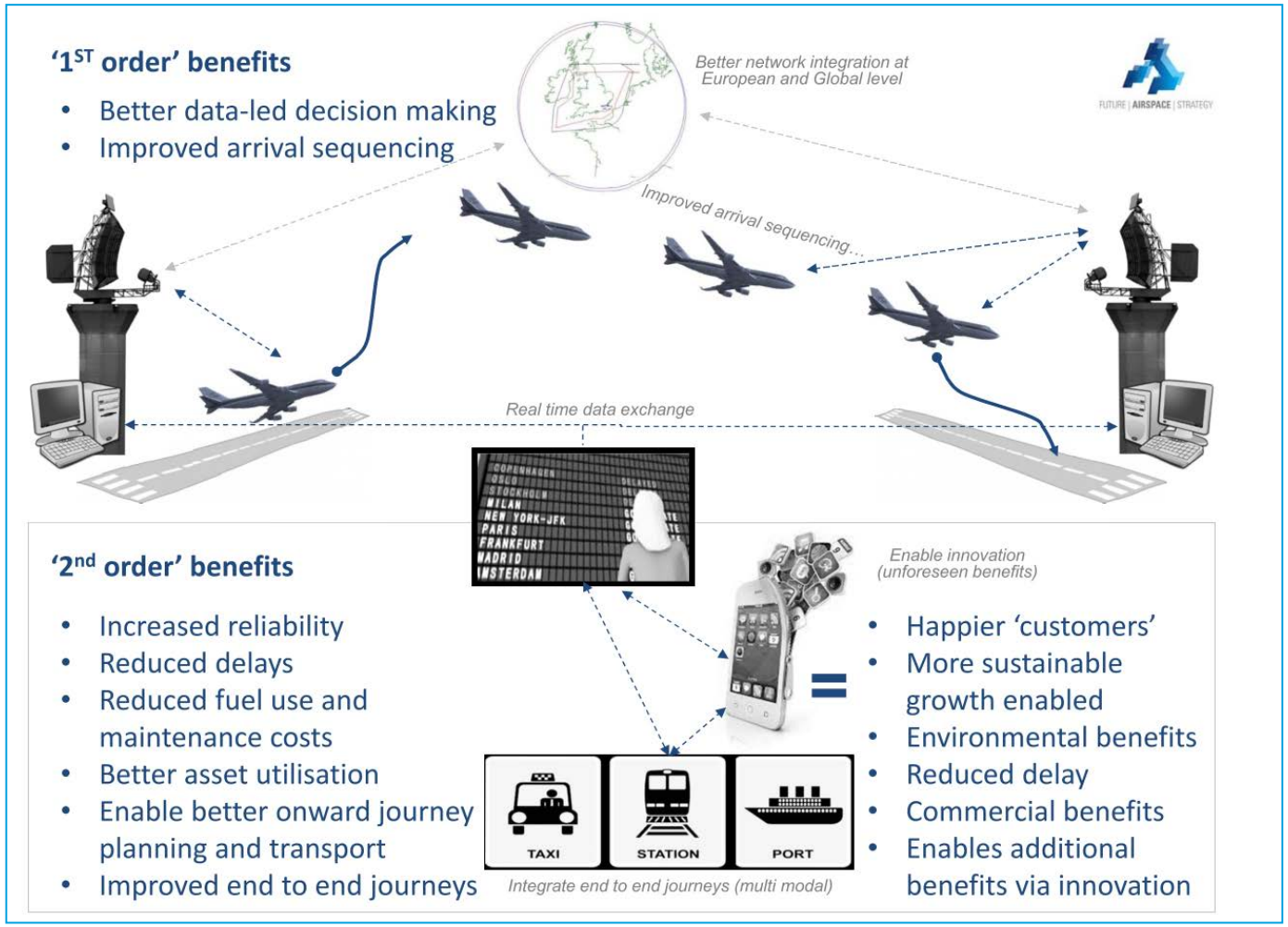
Departure Planning Information



FUTURE | AIRSPACE | STRATEGY

NATS

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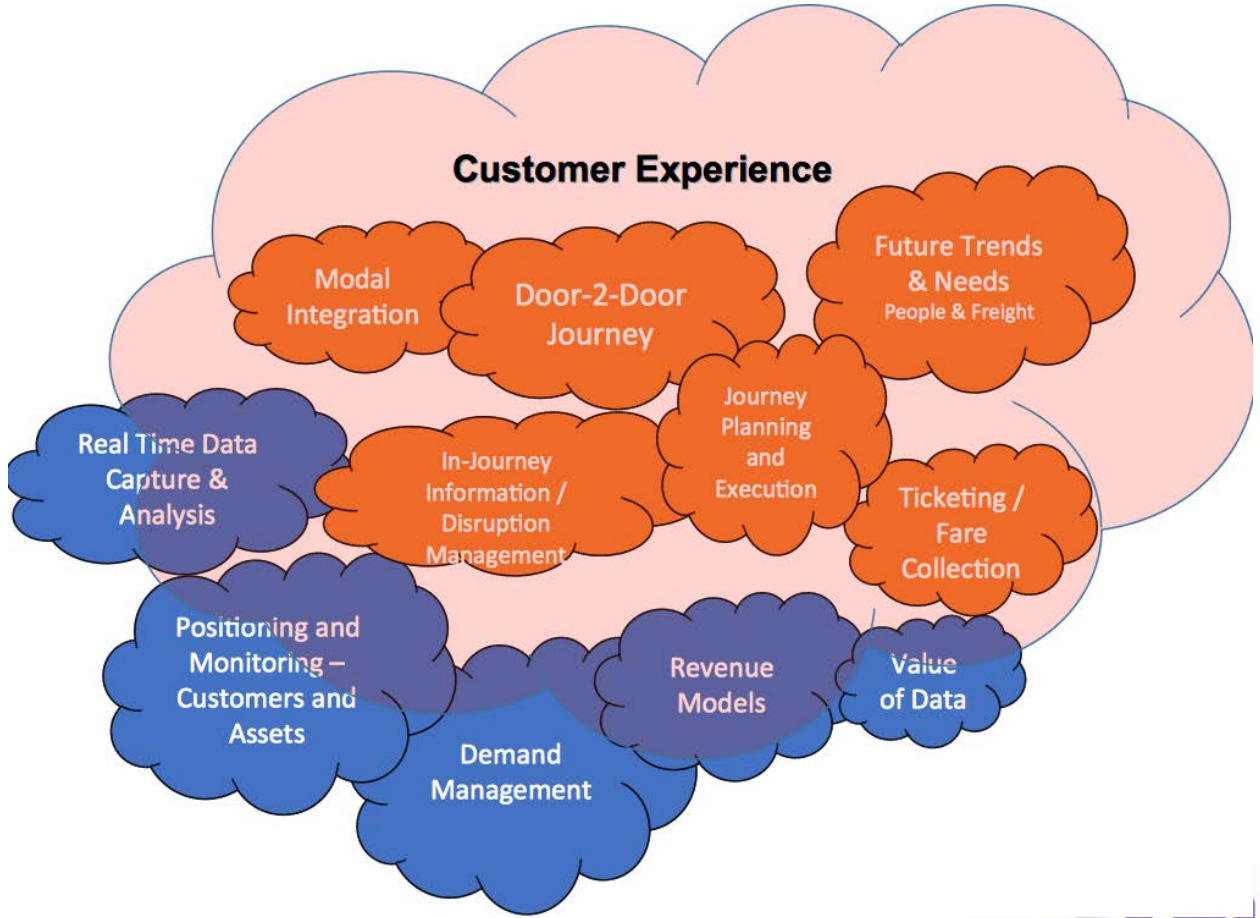
Customer Experience – linked cross modal projects

A set of linked projects with multiple interest and applications that look at Customer Experience at a system level to enable better cross modal interaction as well as inter mode interaction with the operational system



Relevant parties include:
Technical Strategy Leadership Group
Passenger Focus
Automotive Council
Highways Agency
All Local Authorities
Department for Transport
Transport for London
Marine Industry Leadership Group
Aviation sector – airline and airport operators

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Innovation Platforms

- Intelligent Mobility Platform
- Open structure available to commercial modellers – providing access to world-class capabilities
- Enabling Intelligent Mobility testing, experimenting, modelling and data visualisation
- Currently developing reference architecture - creating a modelling framework
- Scenario planning to demonstrate cross-modal capabilities
- To be hosted at the Catapult's Innovation Centre – a place for industry, academia and government to collaborate

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Consultation
Collaboration
Integration

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