



Department
for Transport

The Future of Mobility

Changing technology and business models



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DfT Office for Science

Role of the Chief Scientific Adviser (CSA)



Prof Phil Blythe is the Department for Transport's (DfT) Chief Scientific Adviser.

His role is to:

- Provide leadership on developing technology and innovation
- Improve the strategy for science and innovation research and future proof decision making
- Position DfT as a leader in science across Whitehall
- Develop stronger links between science and internal stakeholders and provide strategic science input and evidence into analysis work programmes
- Support Industrial Strategy and Sector Deals





A Grand Challenge on the Future Mobility gives us a great opportunity to cement the UK's place at the forefront of a huge global trend

The Industrial Strategy established Grand Challenges to “put the UK at the forefront of the industries of the future, ensuring that the UK takes advantage of major global changes, improving people’s lives and the country’s productivity”



Future of Mobility

We will become a world leader in the way people, goods and services move



Clean growth

We will maximise the advantages for UK industry from the global shift to clean growth



Ageing

We will harness the power of innovation to help meet the needs of an ageing society



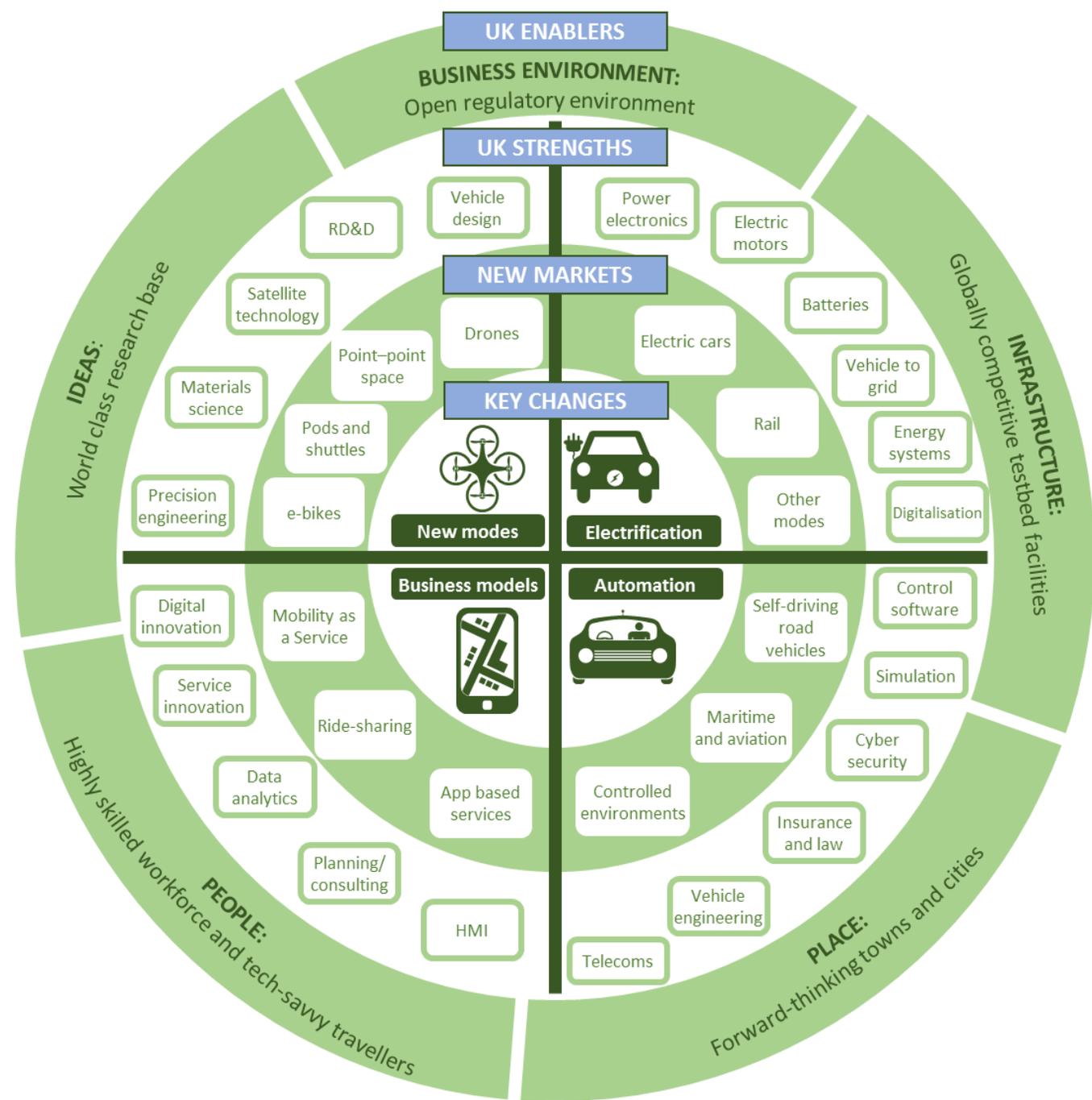
Artificial Intelligence

We will put the UK at the forefront of the AI and data revolution.

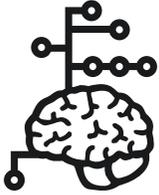
What is changing?

- ▶ For many years advances in transport services have been incremental and predictable. Fixed infrastructure, a legacy regulatory framework, and lack of access to data created high barriers to entry for innovators.
- ▶ This is no longer true. Advances in data science, artificial intelligence and sensing technology have increased the clock speed of transport innovation.
- ▶ On roads and rail, in the air and in the sea, automation, electrification and demand-led transport services promise to improve safety, reduce emissions and improve user experiences.
- ▶ The UK was at the cutting edge of previous transport revolutions and is well placed to lead this one too.





Rapid advances in technology and new business models are driving fundamental changes to way in which we get around



Automation – Improved sensors, increased levels of computing power and data and the potential of Artificial Intelligence are leading to increasing levels of automation in transport.



Shared mobility – Enabled by digital platforms, and in line with a shift towards a sharing economy in other sectors, models based on shared ownership or use of vehicles are becoming more prevalent.



Cleaner transport - Rapidly falling battery prices, improvements in energy density and electric motors and developments in alternative fuels are decarbonising existing modes as well as sparking the creation of new modes.



New business models – We are seeing the emergence of new digitally enabled models of transport provision including dynamic demand responsive transport and Mobility as a Service.



New modes – New ways of transporting people and goods, such as drones and e-bikes, are being enabled by automation and electrification.



Data and connectivity – Vehicles are capable of communicating with each other and with physical and digital infrastructure, allowing information to go to network operators and users in real-time and optimise fleet and network management.



Changing consumer attitudes – technology is affecting people's attitudes to travel. Users are increasingly expecting to be able to plan, book and pay for transport through mobile applications.

These changes have the potential to lead to a transport system that is safer, more responsive to user needs, more accessible, and more efficient. But there are potential downsides to manage too.





These changes will emerge in unpredictable ways, and will pose major questions for transport policy

Timing



- ▶ Predictions for when new transport services will come to market vary wildly – driverless cars could be five or fifty years away.
- ▶ This complicates policy that is reliant on forecasting – changes could be unexpected and sudden.

Infrastructure



- ▶ New infrastructure, both road and comms will be needed. Uncertainty into what will be needed.
- ▶ Wrong decisions could mean investing in infrastructure that is obsolete before it is useful, or limiting the scope for innovation.
- ▶ We need to engage closely with market to understand how we can increase incentives for private sector investment.

Regulation



- ▶ Transport regulation has grown up piecemeal over many years, and could hamper innovation.
- ▶ Setting a framework for technology is not yet established is challenging.

Trust



- ▶ Different groups in society respond to technology differently and the rate of adoption varies accordingly.
- ▶ Involving people in the design of new transport services is likely to help public acceptance.

Data/ security



- ▶ All networked devices are vulnerable to cyber attack.
- ▶ Acting now gives us the opportunity to design in security at an early stage.
- ▶ A framework will be needed to enable data sharing while protecting privacy and preventing anti-competitive behaviour.

Employment



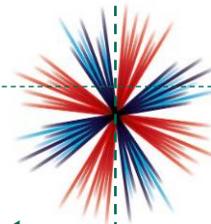
- ▶ Approx. 1.7m people work in the transport sector in the UK.
- ▶ Greater automation will influence the labour market, creating new jobs and removing current ones.



The Industrial Strategy committed to four early priorities under the Future of Mobility Grand Challenge...

1. Establish a flexible regulatory framework to encourage new modes of transport and new business models

2. Seize the opportunities and address the challenges of moving from hydrocarbon to zero emission vehicles



3. Explore ways to use data to accelerate development of new mobility services and enable the more effective operation of our transport system

4. Prepare for a future of new mobility services, increased autonomy, journey sharing and a blurring of the distinctions between private and public transport

We have worked with GO-Science on a Future of Mobility Foresight study

Foresight studies provide evidence to help make policies more resilient to the future. The **Future of Mobility** study looked at the trends and drivers affecting transport over the coming decades and their wider implications for society.

The study has focussed on:

- ▶ Transport governance.
- ▶ How and why users make transport decisions.
- ▶ The movement of goods through the system.



The Foresight study includes opportunities as well as risks, and has developed potential scenarios for the future. It will help you make better informed choices on long term transport decisions, and on the potential effects that the decisions we make now have on the UK of tomorrow. The study is planned for release in the New Year.

We have created Visions of the Future for 2030 for key future technologies



- ▶ To help anticipate the future and achieve the best outcomes from emerging technology, the DfT Office for Science have created a series of visions for the future of technology and the potential impacts on transport systems and how we travel.
- ▶ The visions are hypothetical but plausible, aspirational futures for passenger and goods transport in the UK in 2030 based on Mobility as a Service, smart infrastructure & construction, hybrid aviation and Hyperloop.
- ▶ The visions act to provoke discussion on what sort of transport system we would like to deliver and how DfT might achieve these positive outcomes.

