

Low Carbon Urban Mobility, mapping stakeholders interest: *what & how*

TRANSPORT SYSTEMS CATAPULT



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CATAPULT
Transport Systems

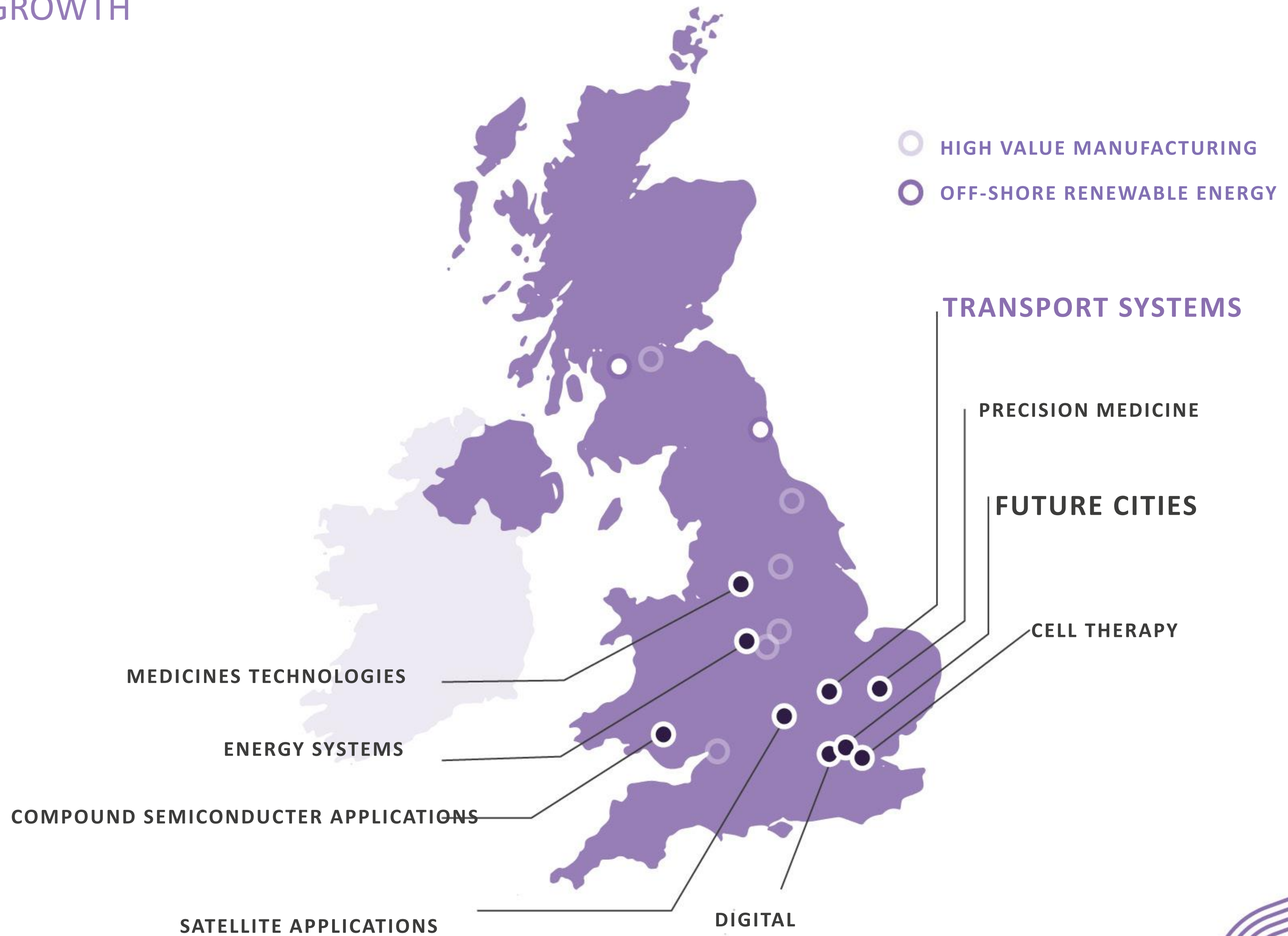
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A NEW FORCE FOR
INNOVATION & GROWTH

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£1.4 Billion

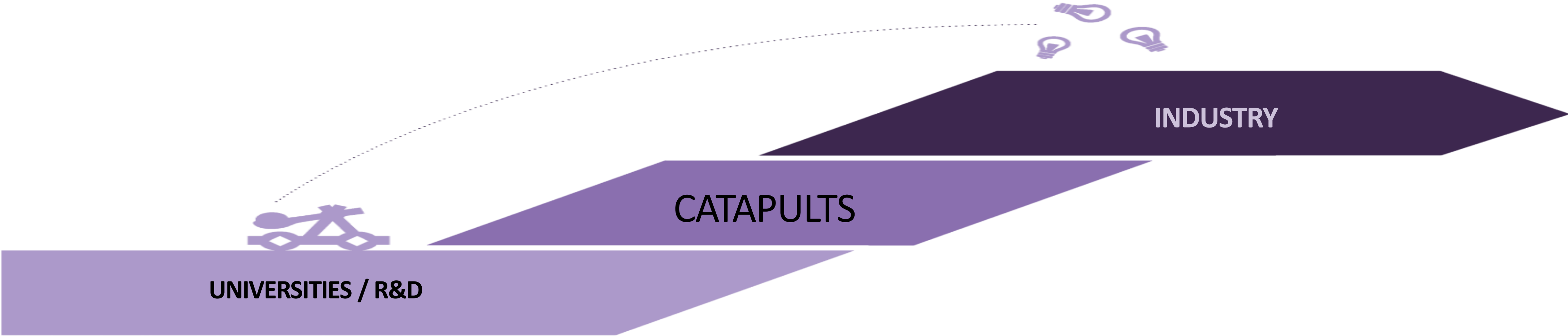
Public and Private
Investment



A TRANSLATIONAL INFRASTRUCTURE

Technology Readiness Levels

Turning innovation into large scale demonstrations



Invest in research Excellence



Develop a translational infrastructure



Target areas of UK Industrial and start-ups & SMEs potential



Content

- **The Problem**
- **Low Carbon Mobility_** main features
 - Eco-mobility, a solution?
- **Vision for sustainable mobility:**
 - stakeholders involvement
 - users' attitude
- **Intelligent mobility and low carbon transport**
- **Case-study Manchester & TfGM**
- **Conclusions**

The Problem

Transportation sector “**will not achieve the international community’s climate ambitions**” of zero emissions by the year 2050 (The International Transport Forum- Transport Outlook, 2017).



A definition of Eco-mobility



UNEP (2016). A Toolkit for Preparation of Low Carbon Mobility Plan. United Nations Environment Programme, Nairobi.

EU: GHG Emissions by Economic Sector

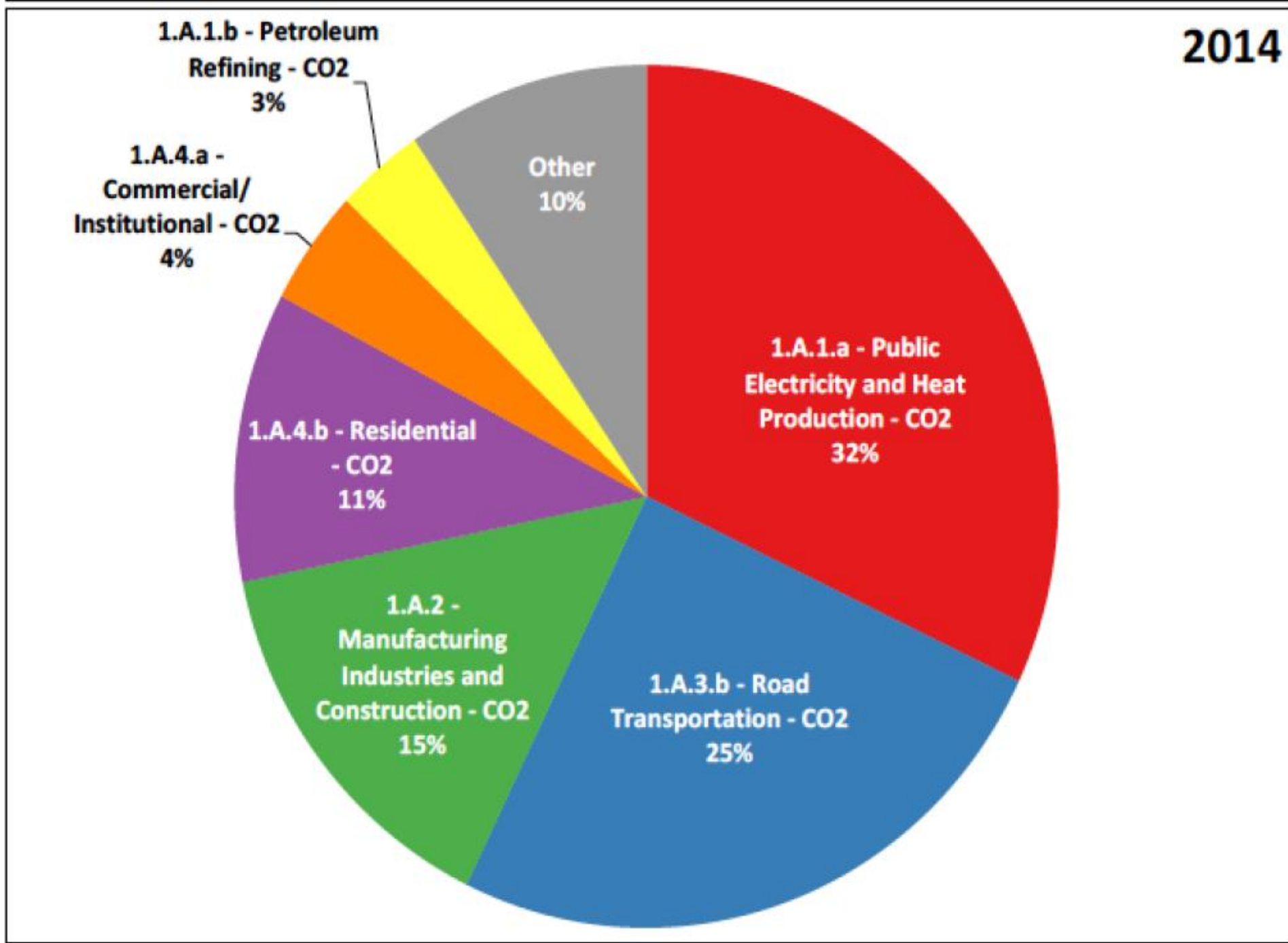


Fig. 8a: EU Greenhouse Gas Emissions by Economic Sector, 2014 (EEA, 2016a, figure 3.2)

Low-Carbon Mobility

- A rapid shift to low-carbon mobility with in-reach technologies
- Today, the car is at the heart of personal mobility, offering us independence and our own space – at **the price** of:
 - congestion
 - pollutants and
 - a rising contribution to climate change.

Can we do things better?

Integrated policy coalition

- Avoid
- Shift
- Improve



Low Carbon Mobility_ main features

Why: air quality & health; climate change

What?

Integration: Integrate the mobility plan with urban growth, structure and urban form

Equity: Provide accessibility and safety for different socio-economic groups and genders

Modal Shift: Prioritise sustainable modes of transport – i.e. *public transport, and non-motorised transport.*

Environment: Reduce impacts of transport on **local air quality and CO2 emissions.**

How does it work?

- **LCMP** (Low Carbon Mobility Plan) needs to be seen as an integral part of project/programme identification and implementation for transport at the city level.
- Outcomes should be **included in decisions** regarding projects/ programmes
- Process of achieving **mobility goals with lower CO2 emissions** consists of six main steps:
 - 5 steps related to the *preparation* of a Low Carbon Mobility Plan: improved mobility, access, safety, reduce energy
 - last step is *implementation and monitoring.*
- LCMPs should be prepared every *three to five years.*
 - *Monitoring post-implementation* is expected to provide an input to the subsequent exercise.

Low Carbon transport: EV

- Urban Transport **energy efficiency** and **environmental sustainability** continue to present big **challenges** for city leaders and policy think tanks
- The share of the world's population living in cities grows to nearly 70 per cent between now and 2050
- **Urban transport energy** consumption is forecast to **double** to meet the travel demand in the world's future cities

- **Electric vehicles to grid**



Attitudinal Statements

UK survey, 2007:

- *If the environmental performance of cars matters, they say, it's down to the government and the motor industry to sort it out.*
- *We're such a small country... what difference is it going to make?", "look at China"*

UK survey 2017:

- *Sometimes the right information is lacking: environmental cost*
- *Green-mobility is healthier: alternatives to cars are a must!*
- *A holistic **vision** for low-carbon urban mobility is needed*
- *There is impressive **innovation** in the industry*

Attitudinal statements Birmingham Forum, May 2007



72%

"I would reduce car use but there are no alternatives."



63%

"Car driving can be stressful."



46%

"I never use the bus."

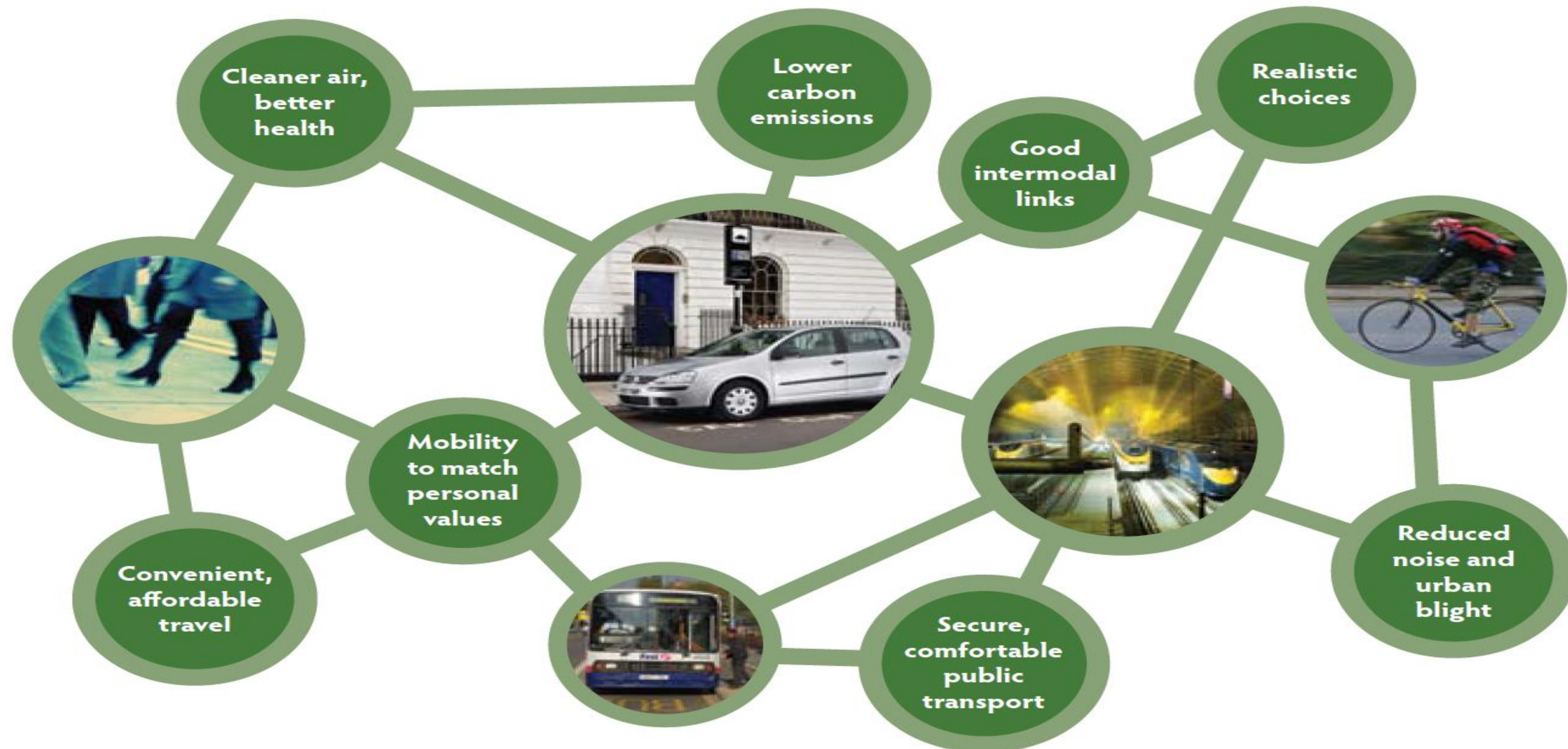


25%

"I'm trying to use the car less."

Stakeholders: passengers, industry, research establishment(s), local authorities, planning organisations, SMEs, infrastructure bodies, etc.

Vision of sustainable mobility

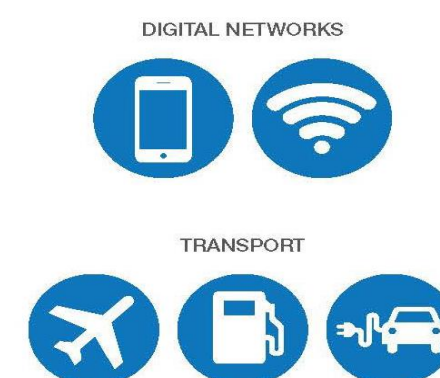


Intelligent Mobility & Low Carbon Transport

Decarbonisation / low-carbon transport at urban & regional level:

- needs to address all transport modes
- embrace a new mobility culture
- requires a substantial paradigm shift

Also, it requires a comprehensive **strategy going beyond the vehicle**

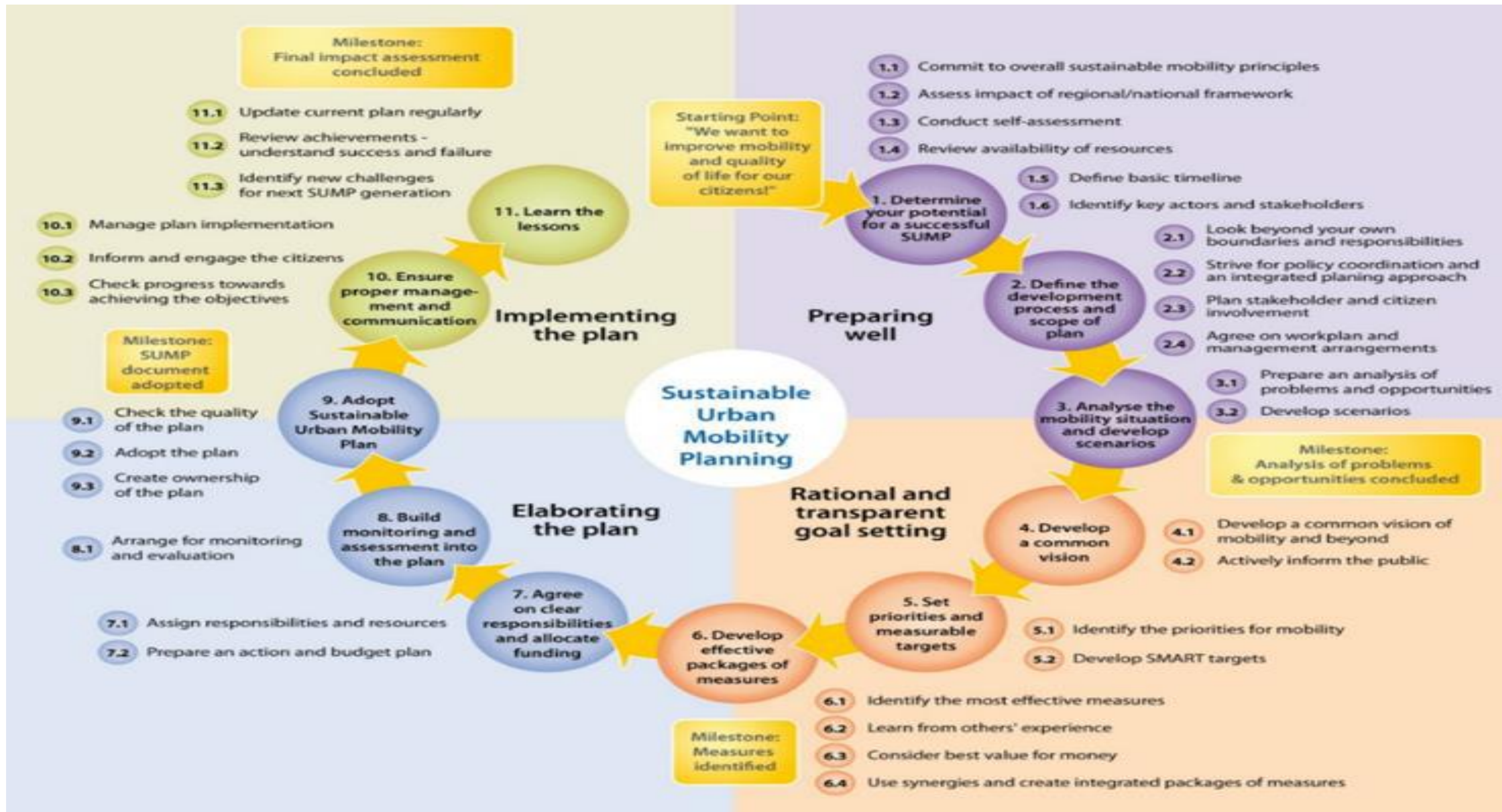


Paradigm shift towards cleaner urban mobility

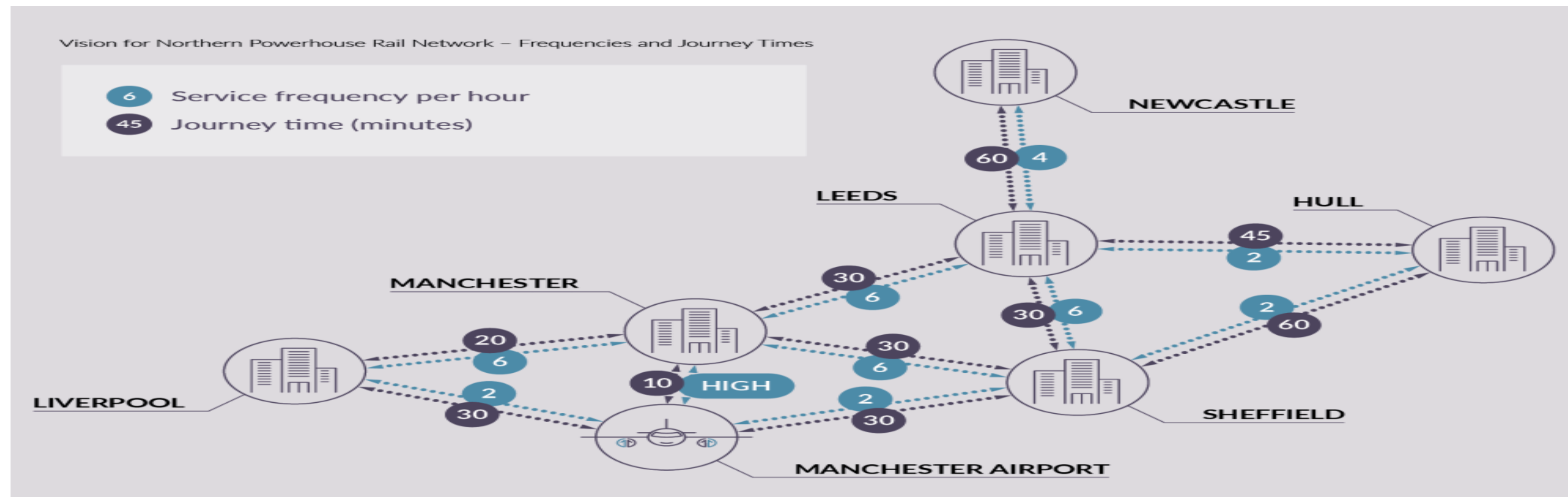
- **Multimodal transport** systems approach
- Prioritise captive fleets: shift fleets from diesel-based engines to fuel cell or electricity
- Need for safe and secure European standards and tools to accurately measure vehicle pollution emissions
- **Sustainable Urban Mobility Plan (SUMPs)**

Active mobility –Healthy lifestyles





Opportunity for cooperation: The North of England

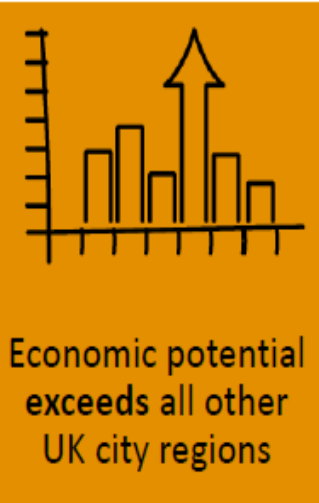
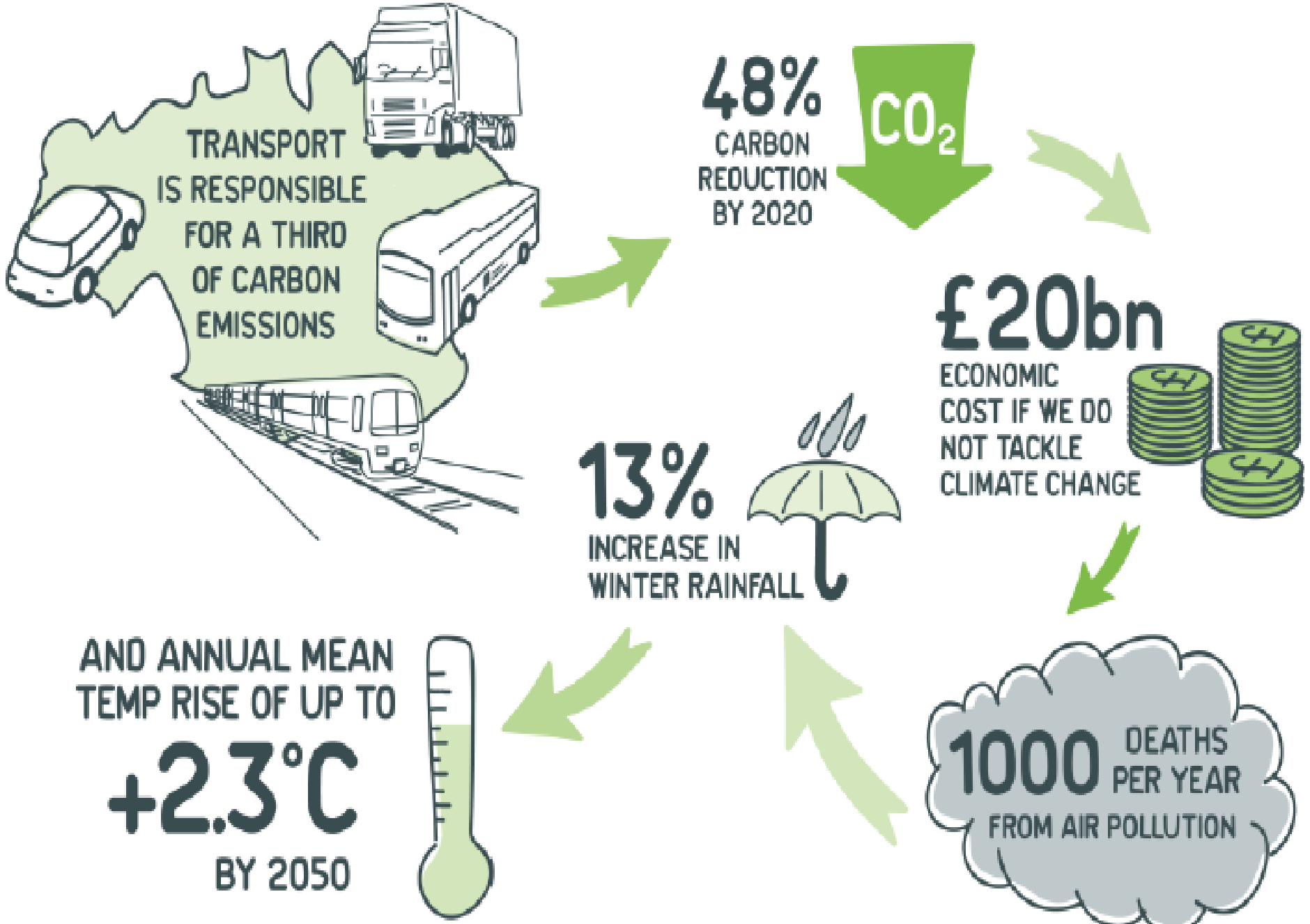


Manchester

TfGM (Transport for Greater Manchester)



PROTECTING OUR ENVIRONMENT



ITS in Manchester

TfGM- Responding through Innovation

- Mobile Data Terminals (MDTs)
- Dedicated Minibuses
- Contract Management
- SMART ticket machines and multi modal ticketing options

Flexible on demand transport

- MaaS (Mobility as a Service)
- Big Data for Transport
- **Advanced Energy Solutions**
- IoT Global City Demonstrator



Autonomous Vehicles

UK- DfT- **Centre for Connected and Autonomous Vehicles (C-CAV):**

<https://www.gov.uk/government/organisations/centre-for-connected-and-autonomous-vehicles>

➤ 22 November 2018 — Press release

[From science fiction to reality: People in London and Edinburgh set to be the first to trial self-driving vehicle services](#)

➤ 30 July 2018 — News story

[Government kick-starts work on Future of Mobility Grand Challenge](#)

➤ Dec 2018: **New cyber security standard for developing self-driving car technology released.**



On October 2016, the [Transport Systems Catapult](#) was responsible for putting a self-driving vehicle on UK public streets [for the first time](#). The **demonstration of a UK developed autonomous driving system** marked the conclusion of the LUTZ Pathfinder Project, which began developing autonomous technology in 2014

Shared Mobility and Mobility as a Service (Maas)

MaaS growth could benefit from policy intervention;

- public transport routes • timetables • information • ticketing

There are two core strengths to the MaaS business model:

--**servitisation**, whereby the MaaS Provider

creates a value proposition that comprises a 'bundle'

of *different mobility services*; and

- **Data Sharing**, whereby the MaaS Provider shares data on the

mobility *needs of customers*, to help Transport Operators improve their service

Big Data

The data sources will vary depending on the requirements of the MaaS Provider but are likely to include the following:

- the available route(s)
- data on where customers can access / egress Transport Operator assets and services
- pricing information
- MaaS customer transaction validation
- real time asset/vehicle position
- asset characteristics

The Transport Operators provide capacity and access to mobility assets. The Transport Operators share (via API) data collected from a range of sources, including potentially crowdsourcing activities.

Transport Operators may choose to install sensors to meet the requirements of the **Data Provider and MaaS Provider**

Open Data/Big Data

2025, the benefits of Intelligent Mobility solutions based on **open and shared data** are estimated to include:

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

DRIVING INTELLIGENT MOBILITY

IM DATA HUB

PROVIDING UNIQUE DATA AND EXPERT ANALYSIS TO POWER YOUR TRANSPORT INNOVATIONS

Electric Vehicles to grid

DfT: Road to zero emissions Strategy

<https://es.catapult.org.uk/news/rewarding-drivers-for-using-evs-esc-provides-modelling-capability-in-v2gb-project/>

- **Energy Systems Catapult modelling to support Vehicle-to-Grid electric car project:** it has been appointed to provide modelling support in a consortium project that is studying **how to reward drivers** who use their electric car batteries to support the UK's power grid
- **Mobilising the response to Electric Vehicle Growth** in the UK has urged all market players – transmission, network operators, government, vehicle manufacturers – to come together and explore ways to avoid network capacity constraints

Invitation

STRIA event on **Low Carbon Integrated Urban Mobility; *learning by doing***

- During the Romanian Presidency of the European Council:

When: 28-29 May 2019

- Cluj Napoca, *the “Silicon Valley of Eastern Europe”*
- <https://www.smartcitiescee.com/>



Conclusions

- ✓ **Energy and transport** are massive sectors and not often considered from a whole system approach
- ✓ There is a need for a coordinated low carbon innovation strategy with some clear lines of leadership and ownership
- ✓ De-solification: coordination on CO₂ across modes
- ✓ Clear recurring themes:
 - Batteries (Faraday Institute in UK)
 - Biofuels
 - Hydrogen
 - Lightweighting
 - *Scaling up of innovation opportunities*

Important: consider an integrated transport system!

ITS, MaaS, Shared mobility, ITS, Big Data, to be part of an integrated urban mobility in a smart city.

STRIA- Strategic Transport Research and Innovation Agenda will answer to how to tackle a low carbon integrated urban mobility (EC- DG Move & DG RTD)



Thank You...

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