

Innovation on HE roads

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England's economic success depends on the SRN



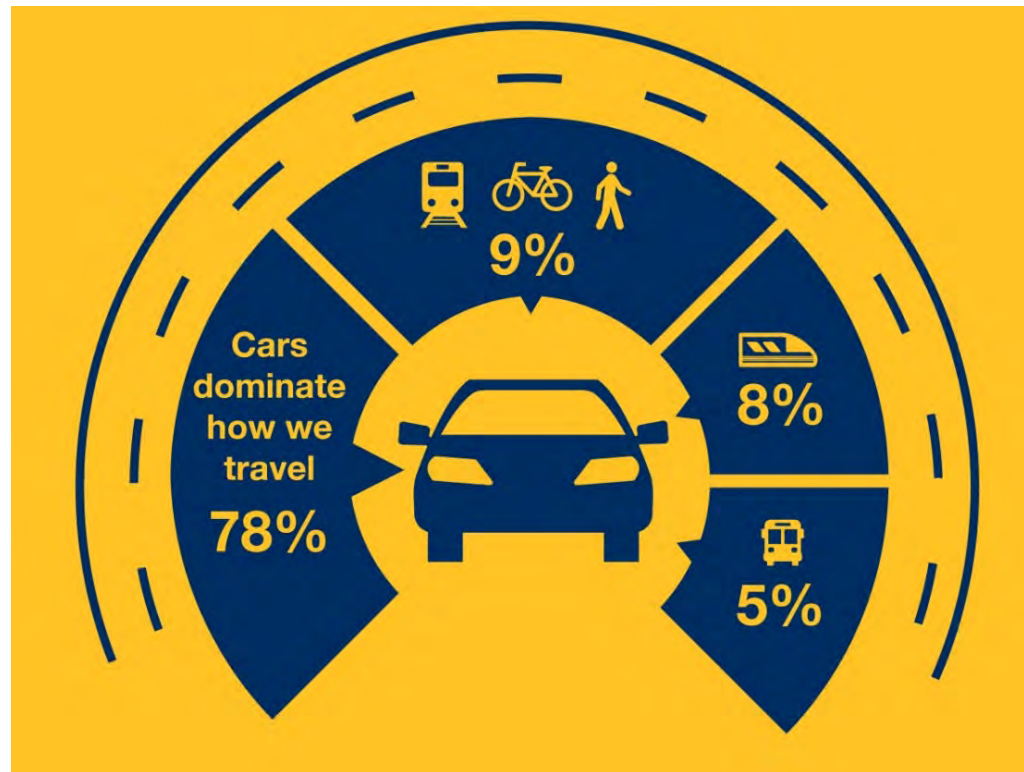
Motorways 42% Major A-roads 58%



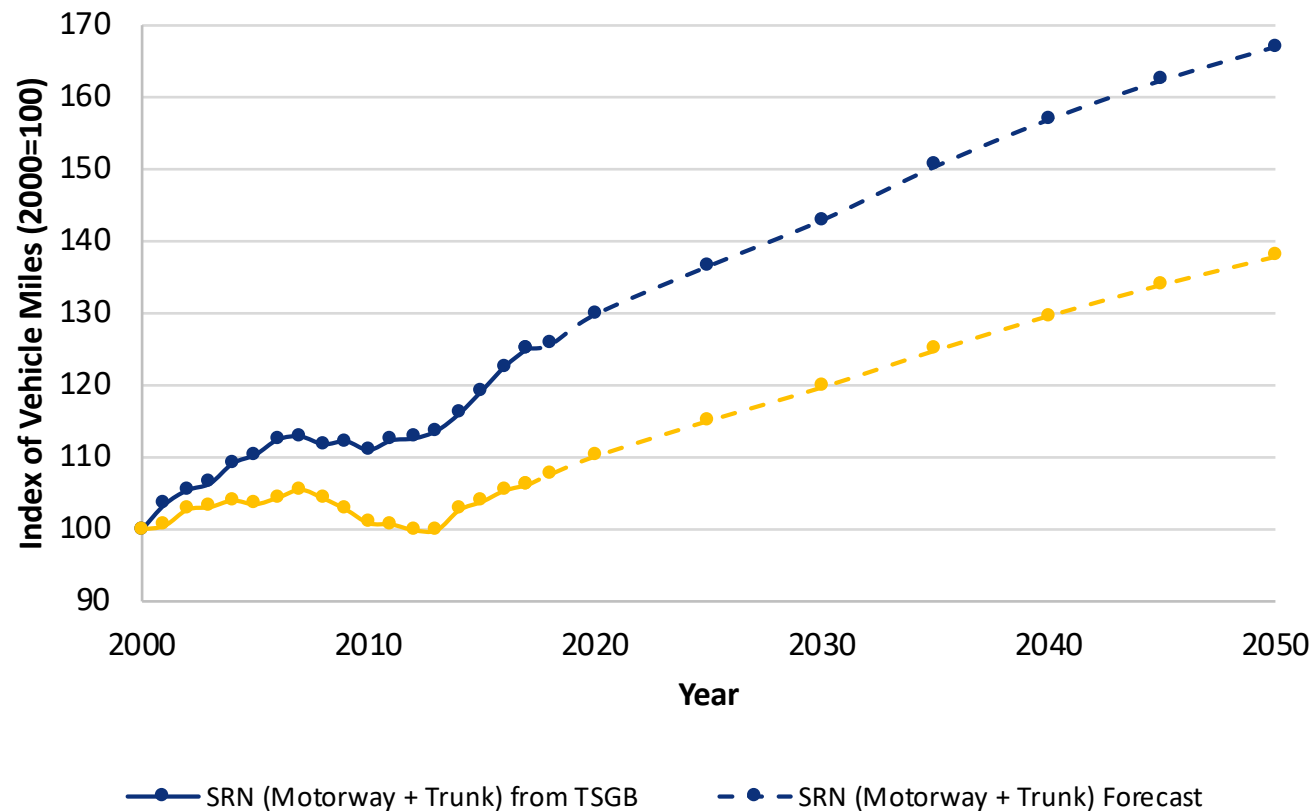
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Road is the main transport mode for people and businesses

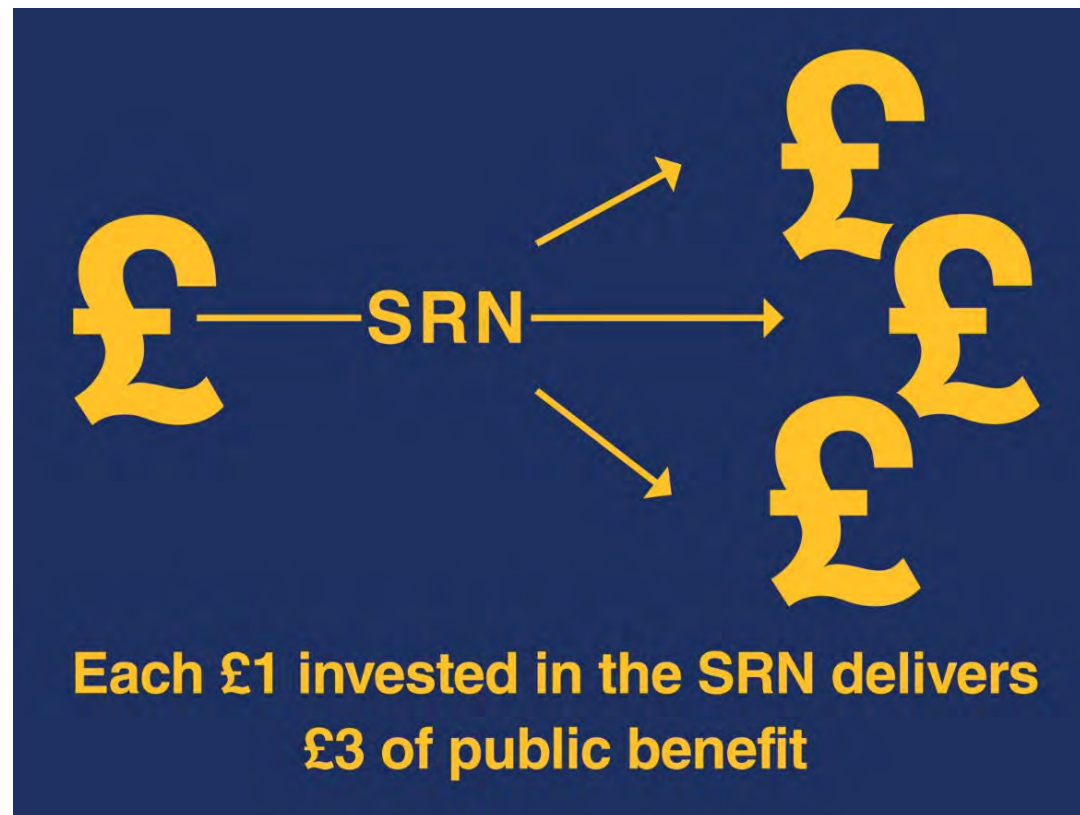


Growth in usage of SRN is forecast to continue

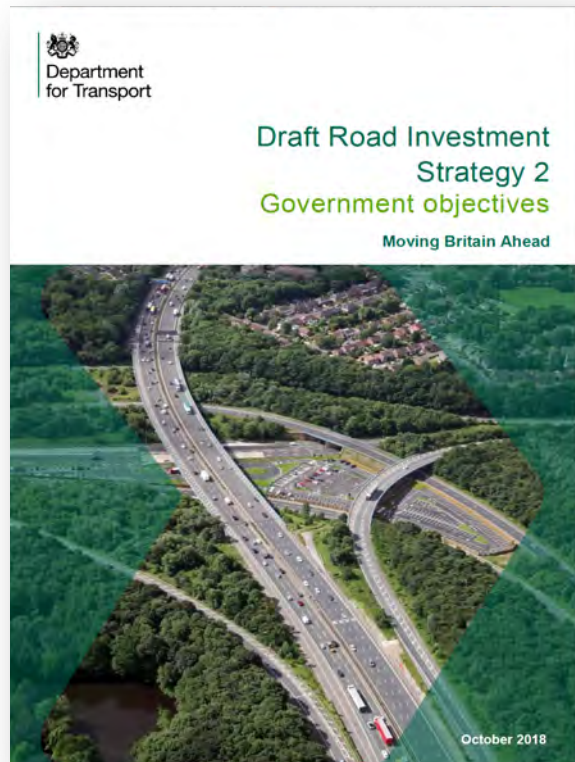


Source: RTF 2018 for forecast and TSGB for pre-2015

Delivering Value for Money



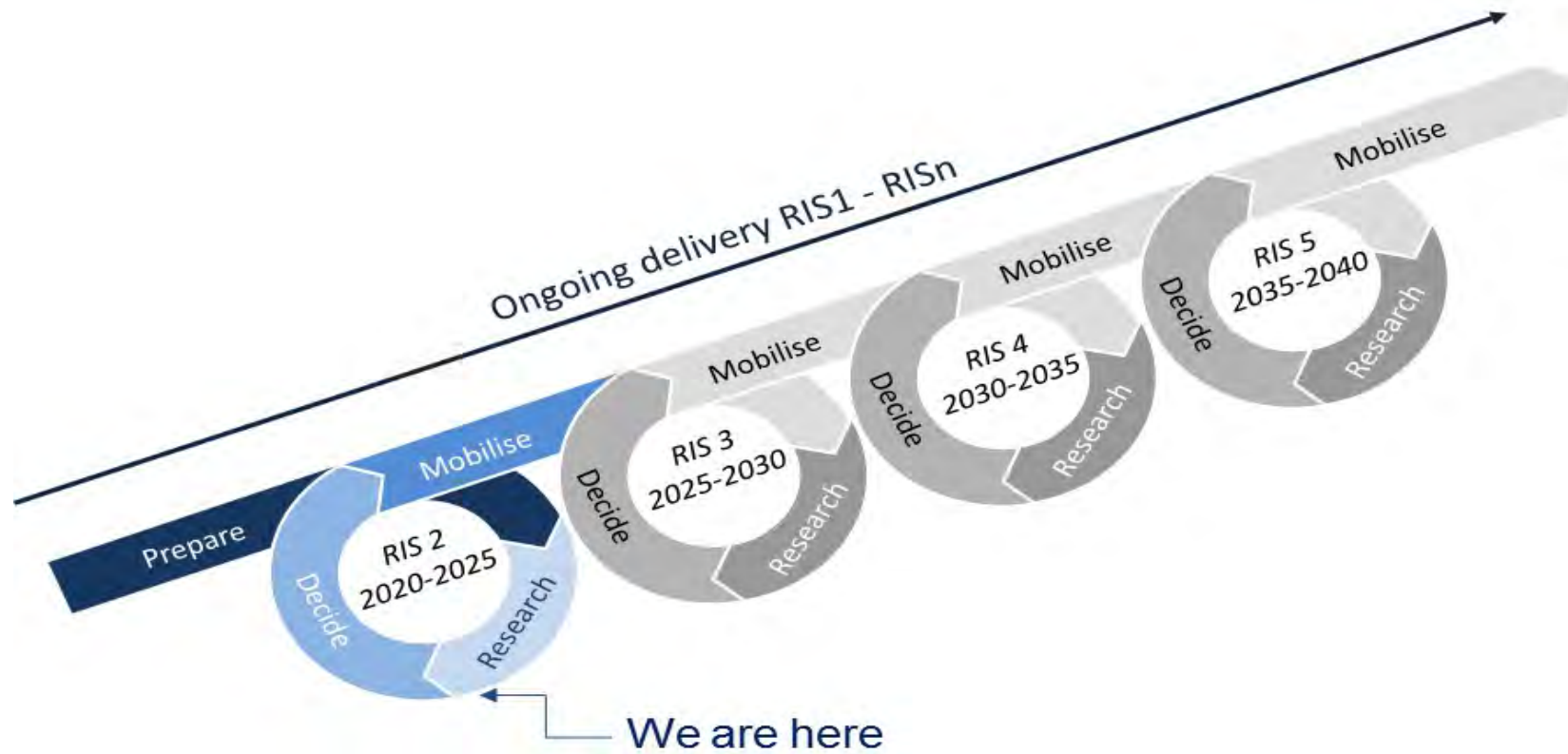
The draft Road Investment Strategy 2



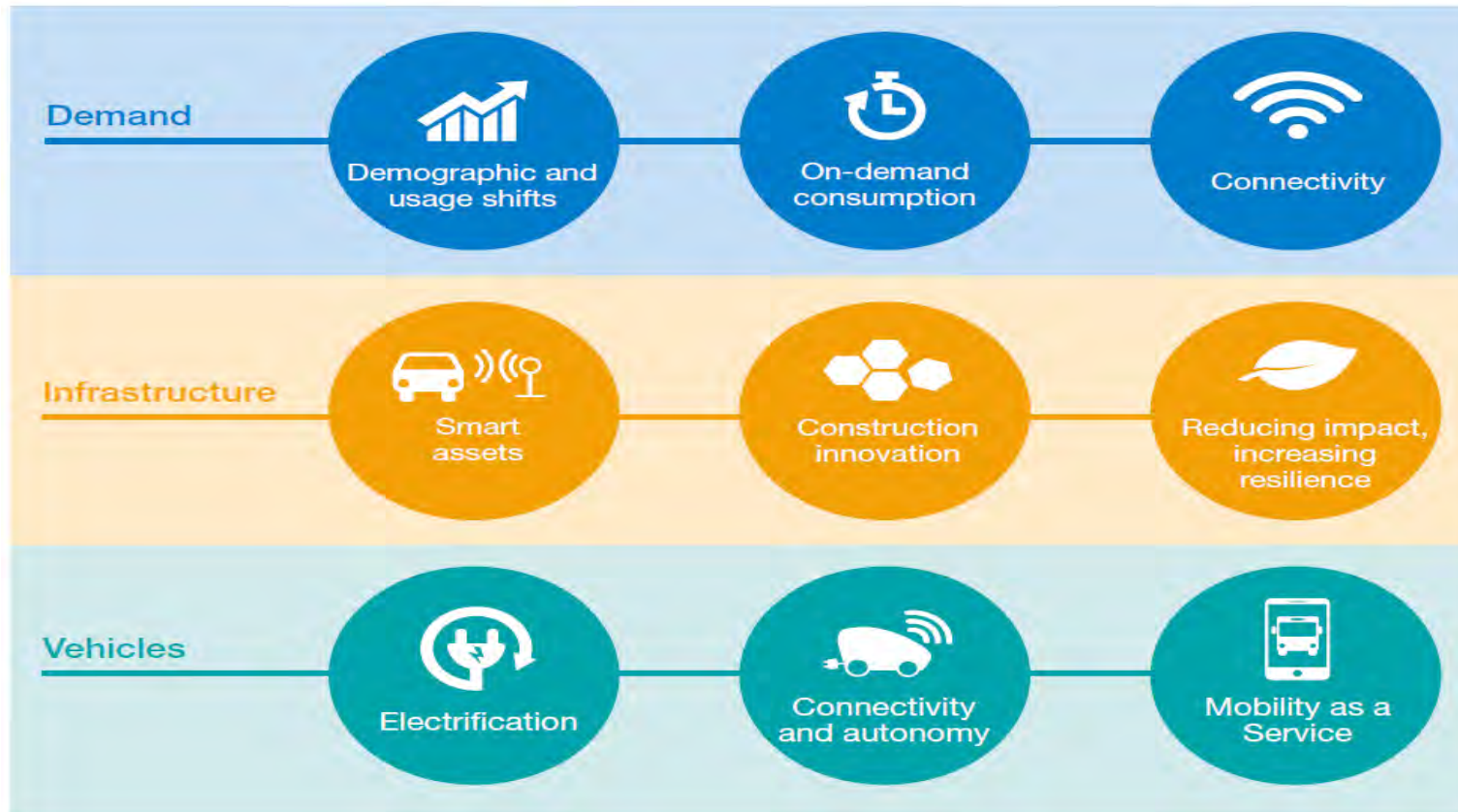
Confirms government priorities

- Supporting the **economy**
- **Safer and more reliable** network
- **Greener** network
- More **integrated** network
- **Smarter** network

We take a long term and evidence-led approach to planning for the future



Future Challenges



Future transport

Zero ownership



Fully automated logistics



Hyperloop testing, funding and assessments



Airbus / Vahana – Personal drone transport trials



CAVs worldwide public testing



MaaS Apps

Digital Roads



- Digital for ***Customer***



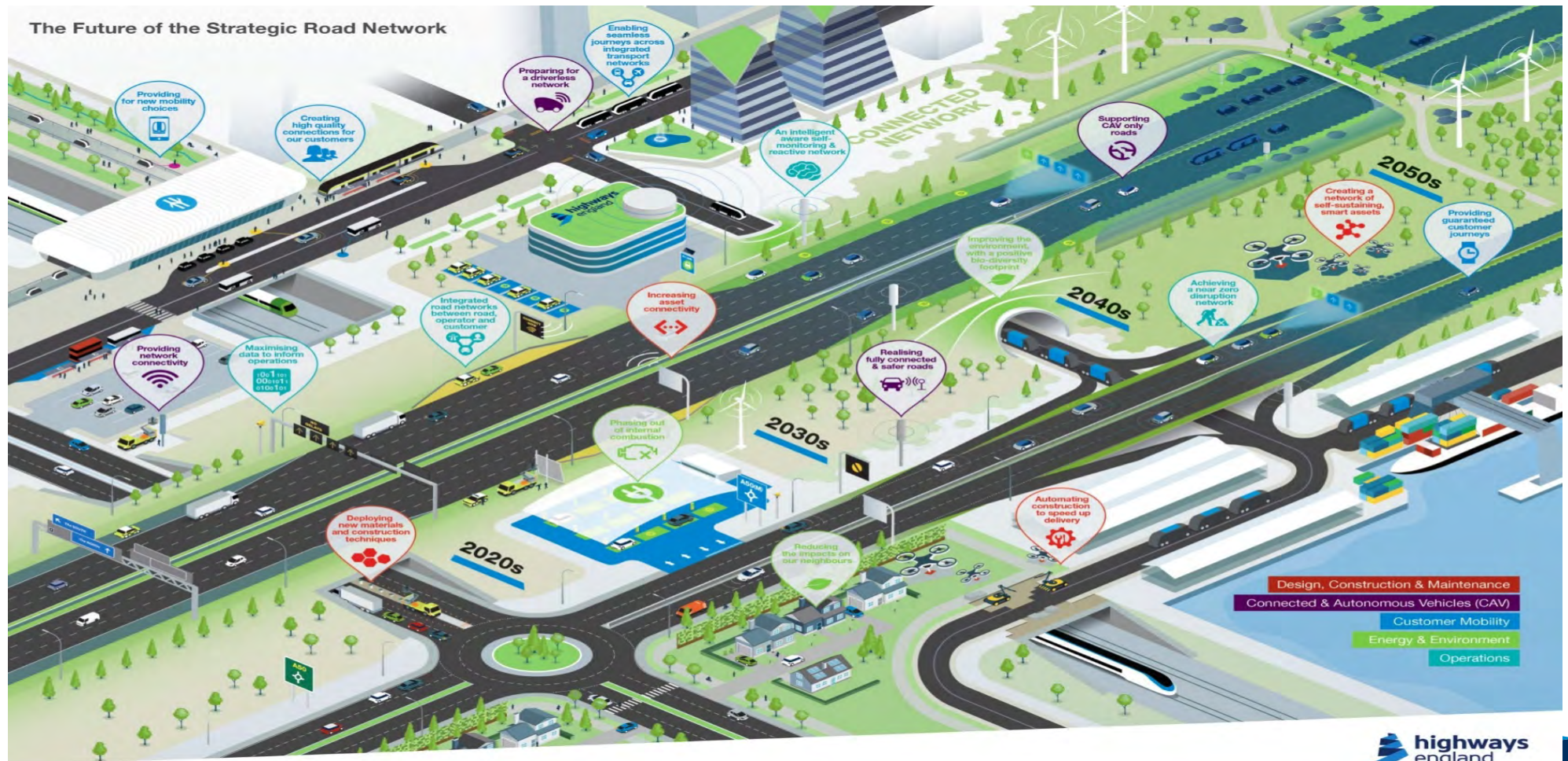
- Digital ***Operations***



- Digital ***Design & Construction***

HE Pavements Innovation, Technology and Research Plan

Planning for the next 30 years



Pavement Innovation activities will be structured around the identified six themes (focus areas):

1. Design
2. Materials
3. Construction
4. Connectivity and digitalisation
5. Pavement performance and condition monitoring
6. Maintenance

HE and industry Collaborative research project

Evaluation and Modification of QA Test Methods

Assessment of
innovative QA
systems v.
conventional
methods

- Laser based system to measure surface **regularity**
- Laser based system to measure surface **macro texture**
- Contactless system to measure in situ **density**

Surface regularity: Laser Straight Edge (LSE) v. Rolling Straight Edge (RSE)



Laser Straight Edge (LSE)

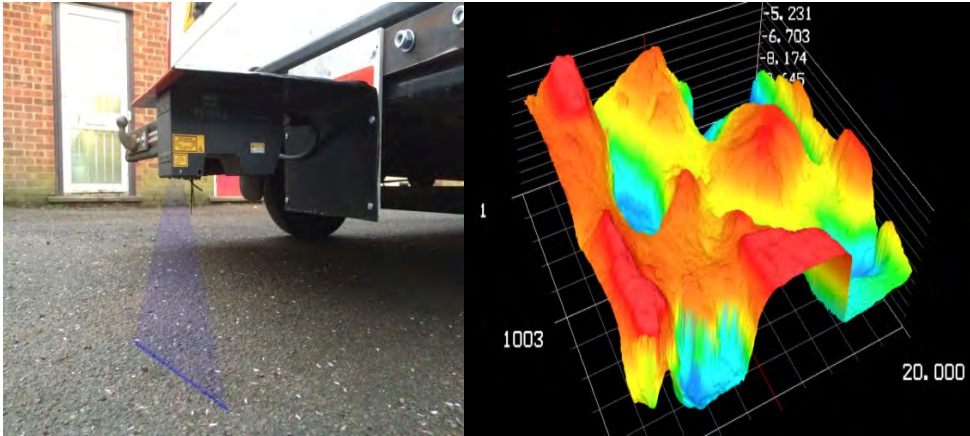


Roller Straight Edge (RSE)

Data available include:

- M1 Junction 5
- M25 Junction 25
- M25 Junction 28
- M25 Junction 23
- M4 Junction 4
- M4 Junction 4 Heathrow Spur Road
- A76 North of Garleffan
- A82 Garshake Road
- M8 Junction 27 Arkleston
- M1 Junction 16-19
- A269 Ninfield Road
- A46 Hobby Horse to Widmerpool

Surface Texture Depth: Laser System v. Volumetric Patch



Laser system



Volumetric Patch

Data analysis

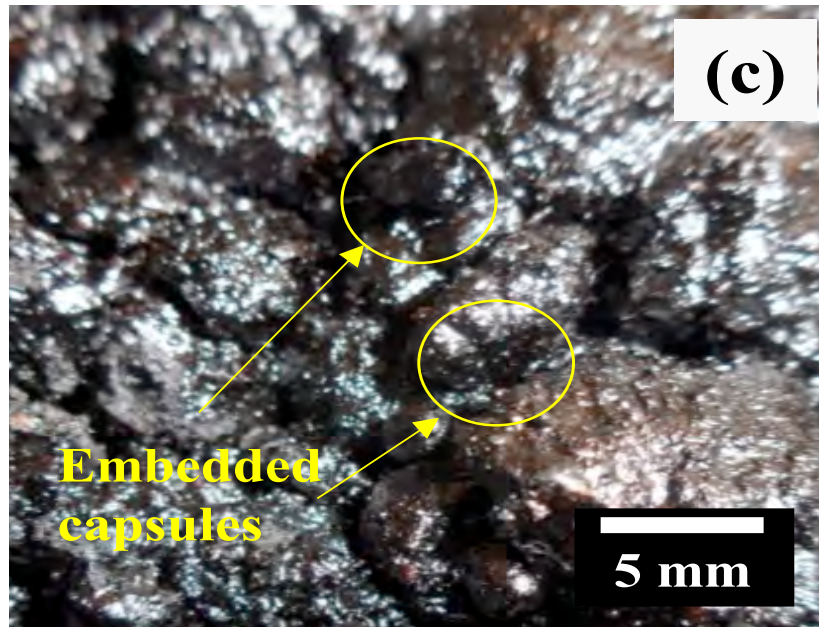
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- M8 Junction 29-28 Arkleston
- M1 Junction 16-19
- A269 Ninfield Road
- A46 Hobby Horse to Widmerpool

Contactless In situ Density



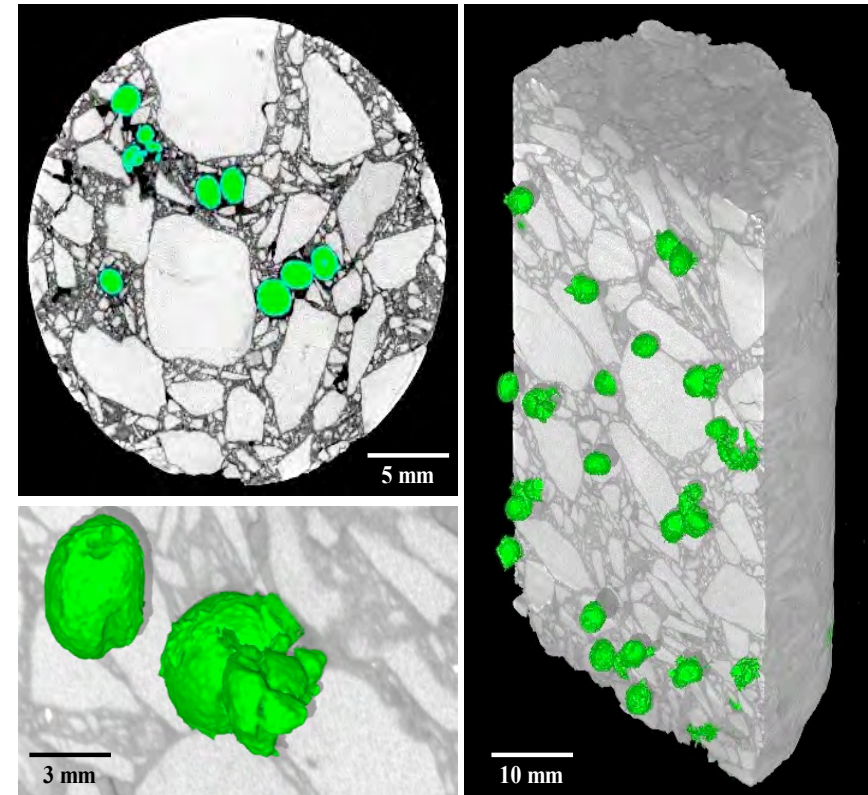
Self-healing Asphalt (Phase II)

This project researches the self-healing of asphalt using embedded sunflower oil capsules



Innovation Theme (Highlight applicable):

Design, construction & maintenance
Connected & autonomous Vehicle
Customer mobility
Energy & environment
Operations



CT-Scans of the asphalt mixture with capsules highlighted in green colour: Top Left: 2D cross-section image of sample with capsules. Bottom Left: 3D reconstruction of the embedded capsules in asphalt. Right: 3D reconstruction of the spatial capsules distribution inside of asphalt sample.

Media:

[BBC News](#)

[CIHT Article](#)

Project for Life Cycle Management of green asphalt mixtures and road pavement

- Develop guidelines towards the introduction of Life Cycle Management (LCM) in National Road Authorities with a focus on Sustainability Assessment
- To produce the PAVEMENT LCM package of tools, guidelines, datasets, roadmaps and recommendations to introduce life cycle management practices into National Road Authorities
- 25th June workshop at University of Nottingham

<https://www.pavementlcm.eu/>

RIS 2 Legacy Concrete programme


- Our legacy concrete pavement is a known 1400 lane km subset of the SRN
- Much of our legacy concrete pavement built in the 1960s / 70s has never been renewed and is in need of a strategic programme of reconstruction due to life expiry

What do our customers want?


Surface quality is road users' top priority for improvement to England's motorways and major 'A' roads, by some margin



Customers want a surface without dips, bumps, potholes, undulations or deep ruts – in other words continuously smooth

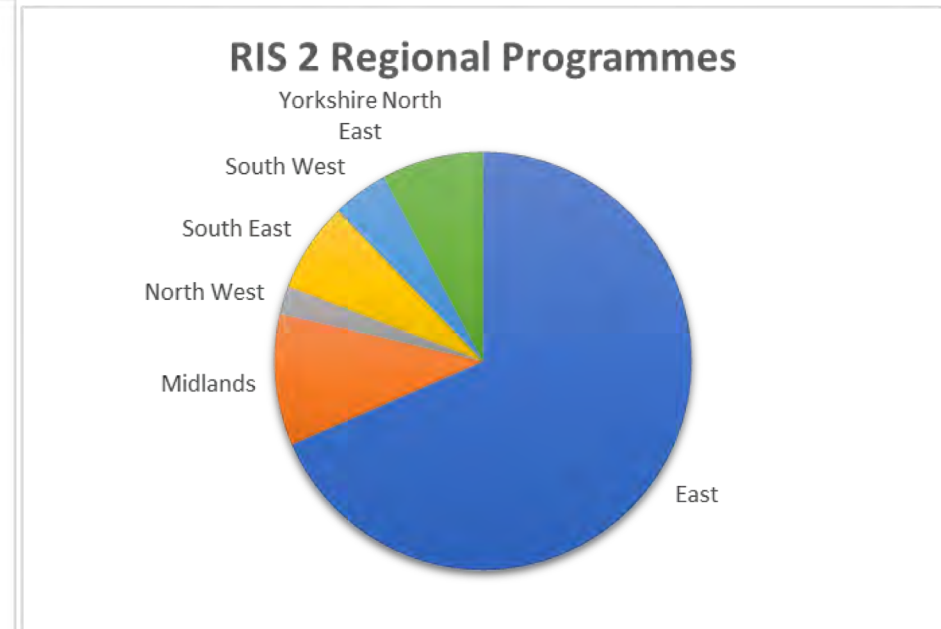
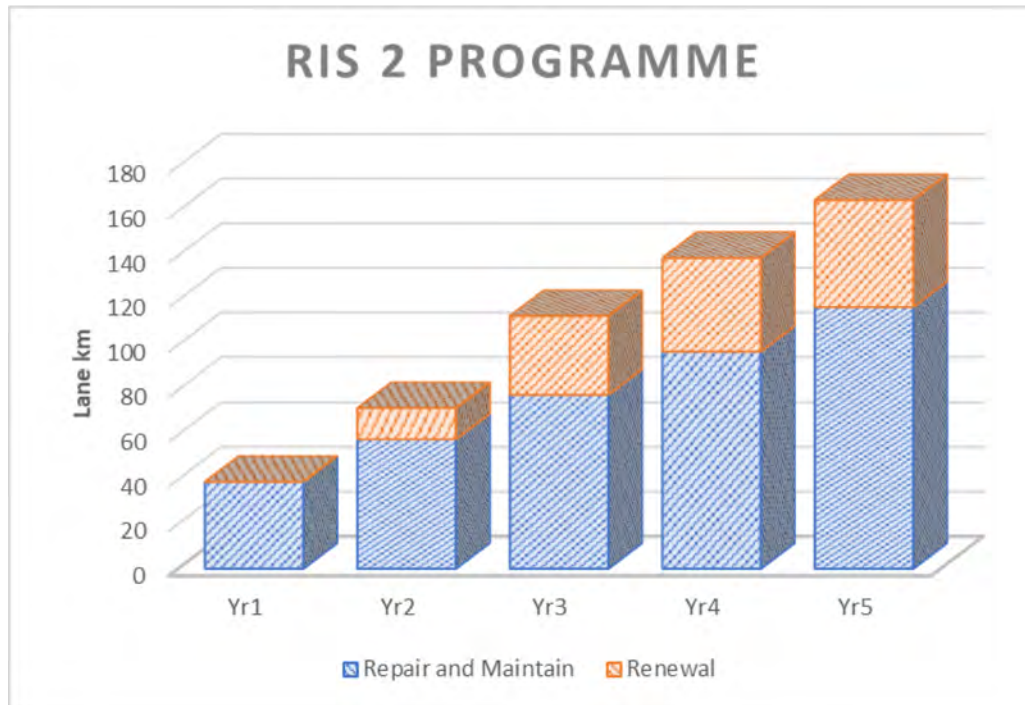


They also want clearer white lines and 'cats eyes', which users regard as part of the surface and not something separate



They prefer asphalt roads to concrete ones, partly because they are quieter to drive on

Road surface quality: what road users want from Highways England, November 2017
Transport Focus & Highways England



- Nationally, we need to renew 140 lane km and repair 400 lane km in RIS 2
- The RIS 2 programme affects only sites where concrete is within 50mm or at the surface

Concrete Innovation Competition

- Concrete competition for solutions and ideas for the maintenance of the concrete roads
- The competition reflects the different stages of project development; one stage is for proven feasibility projects at development stage (**higher TRL**), and another for unproven feasibility projects (**low TRL**) but which show great potential.



www.highwaysengland.co.uk/innovation-hub/

Our Highways England Innovation Community

**Welcome to
our Innovation Portal**

Thank you

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Strategic Road Network in England

7000 km of motorway and major roads

Carries over **30%** of all traffic and **4 million vehicles** use the SRN every day

1 billion tonnes of freight transport on SRN each year: more than all other roads and transport modes combined

148 billion km were driven on the SRN last year

Traffic on motorways has grown by more than **50%** since 1993 and is forecast to grow another **31%** by 2041

Major schemes deliver **£3** benefit to the economy for every **£1** invested

