

The importance of digital infrastructure in other infrastructure sectors

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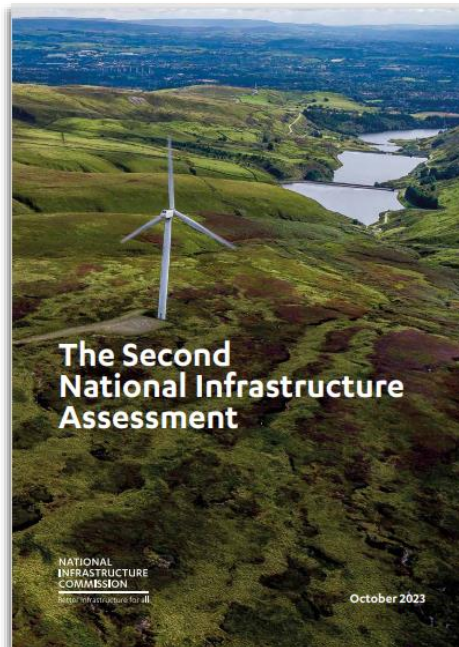
Purpose and mission

The Commission provides government with impartial, expert advice on major long term infrastructure challenges.

- Established in 2015 to provide expert advice to UK Government on long term infrastructure challenges
- Remit covers energy, transport, water and wastewater, waste, flood risk management and digital communications
- Fiscal remit set by government (1.1-1.3% GDP)
- Focused on next thirty years

Our tools to shape the infrastructure agenda

The National Infrastructure Assessment



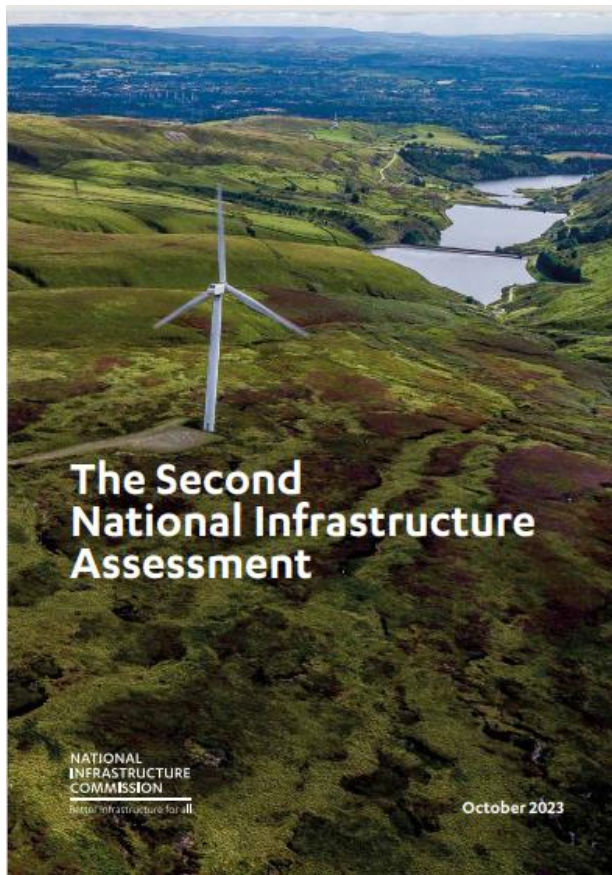
Studies on specific issues



Our annual Infrastructure Progress Review



9 policy challenges for the second Assessment



Digital transformation

There were two parts of our project on digital transformation:

Assessing the **strategic value of 5G** to UK economy and society

Assessing **benefits of telecoms to other infrastructure sectors**, and challenges to deployment.

Government should enable the right conditions for **market led deployment of 5G**

Government should set out **strategies** for delivering the **necessary telecoms** for **energy and water** by end of 2025 and for **transport** by end of 2026.

NIA2 Recommendations

Telecoms uses across infrastructure

Key challenges across infrastructure sectors:



Energy

Decarbonise UK power by 2035, and meet net zero targets by 2050



Water

Leak reduction, monitor quality, manage overflows and incentivise demand management solutions



Rail

Upgrading existing 2G signalling system to 5G by 2040



Road

Support for Digital Roads strategy, inc. support for connected and autonomous vehicles

Potential benefits from better digital infrastructure include:



Reduced emissions – wireless connections for renewable assets and new sources of demand



Support for critical functions - rail signalling upgrade, energy network recovery



Improve efficiency and maintenance - improved sensor networks to support digital twins and predictive maintenance



Enable innovation – wireless connectivity for connected vehicles, AR/VR training for engineers

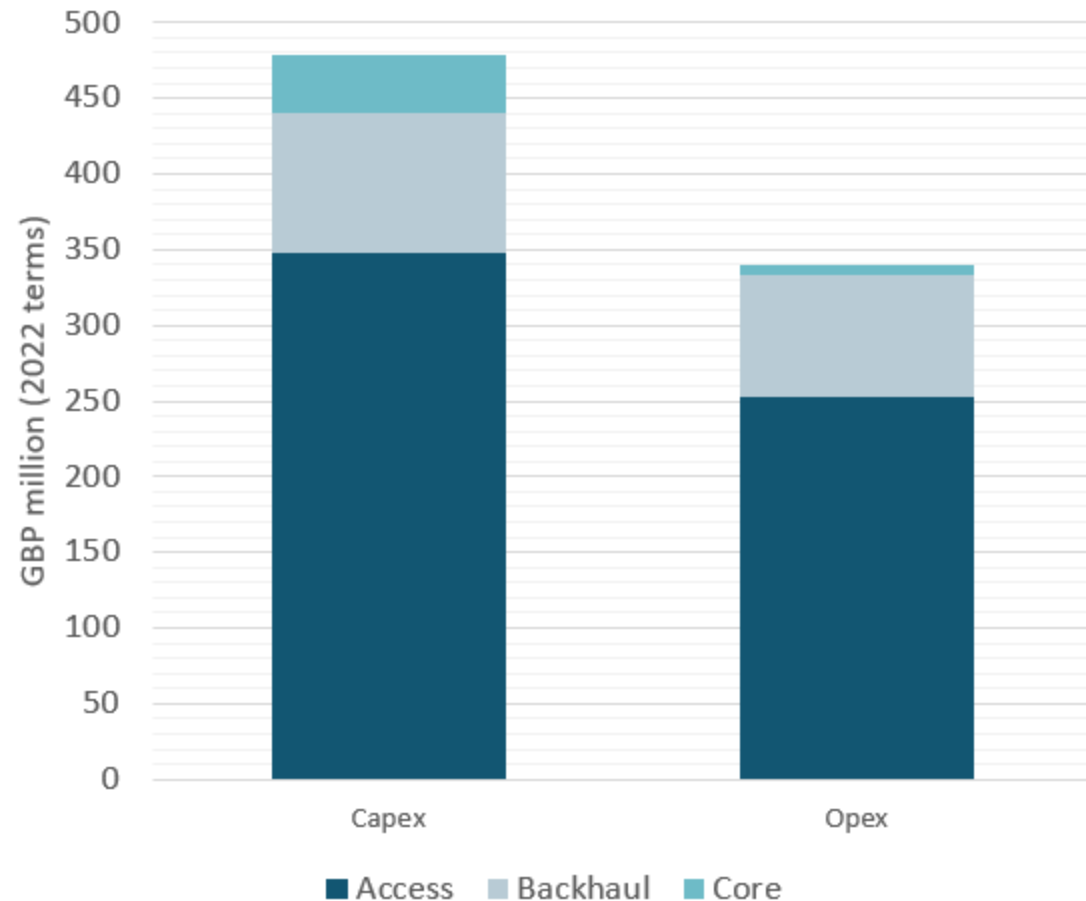
But key challenges remain for policy makers

- **What type of networks are needed?**
 - Likely to need mix of technologies (i.e. 4G, 5G, satellite, fixed).
 - Could be public, private or hybrid networks.
 - Networks will depend heavily on resilience requirements and costs.
- **Input is needed from government.**
 - Financial: For some sectors government will need to set budgets, or if public networks deliver services rural subsidy could be needed
 - Policy steers: steers for regulators on budget or resources i.e. spectrum.
 - Clarity on policy ownership needed – what are roles of sector departments (DESNZ/DfT/Defra) vs DSIT.
- **Timing**
 - Sectors face deadlines over the 2030s, but networks will take time to design and build i.e. spectrum reallocation could take over 5 years. Funding will need to align with funding rounds/regulatory settlements.

Illustrative cost for a bespoke energy network

- As part of our work on the second Assessment, we commissioned **Analysys Mason** to model potential future 5G deployment scenarios.
- In one scenario, Analysys Mason **modelled a dedicated energy network** (covering overhead electricity lines and gas pipelines) using unpaired 1900-1920 MHz spectrum
- This work only considered one bespoke scenario for 5G deployment, but provided **illustrative costs of £817 million** across 10 years.
- **Further work needs to be done** to consider the full requirements of the energy sector and the potential ways this could be delivered.

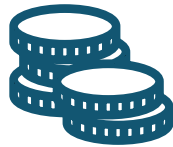
Estimated cost for bespoke utilities network (gas and electric)



Source: Analysys Mason, 2023 – Figure 5:19

Recommendation on telecoms for other sectors

Government to set out strategies for telecoms needs in energy, water (by end of 2025) and transport needs (by end of 2026), to deliver networks by 2030 (energy and water) and 2035 (transport)



Consider most **cost effective** deployment model and possibility of **sharing spectrum**



Spectrum authorisation approach that gives **adequate access to spectrum**



Clear responsibilities for delivering strategies



Whether **additional public policy goals** can be met

Next steps on recommendations

- Government to respond to the full recommendations from the Second National Infrastructure Assessment – expected in due course
- In the meantime, the Commission will carry out further engagement to support our recommendations
- Once the government has responded, the Commission will track progress in delivering our recommendations in our annual Infrastructure Progress Reviews.