

# NEW TECHNOLOGY STUDY SECOND CALL FOR EVIDENCE

The [National Infrastructure Commission](#) (NIC) is carrying out a [study](#) to assess how new technologies can improve the productivity of infrastructure. Our first [call for evidence](#) asked which technologies we should be considering, and the responses focussed predominantly on digital technologies. Building on that initial evidence base, this call for evidence asks for input into four detailed case studies, which will inform our final report, to be published by the end of 2017.

Through these case studies, which are described below, we will be looking at how efficiency gaps can be closed in different sectors (energy, water, transport, digital, waste and flood defence) through the application of new technologies which use data to optimise the operation and maintenance of infrastructure systems. We will be considering the implications of viewing “data as infrastructure” and assessing security and resilience as critical requirements of a future interdependent infrastructure system with data at its core. And we will be looking at models such as digital twins and assessing how coordination at the national level can help us manage this data for resilient outcomes.

## BETTER ASSET MANAGEMENT

How can data on network assets be collated and analysed through the application of artificial intelligence to inform predictive maintenance, optimise performance and extend asset lifetime? This case study focuses on masonry arch bridges in the rail network and looks to estimate the impact of introducing data analytics on similar types of network asset. It will consider the impact of developing a digital twin of our assets as well as the impact of other new technologies, highlighting areas where government may need to intervene to support uptake and rollout across sectors.

## WATER EFFICIENCY

How can new technologies support the water sector in delivering and driving efficiencies, in terms of operational cost and reduction of leakage and wastage? How can we use new technologies to increase resilience? This case study will look at use of sensors, meters, thermal imaging and drones in the water sector to increase efficiency. It will also compare and contrast different practices amongst the water companies to see how new technology, benefits and understanding can best be shared and tested across the sector. We want to identify the key barriers to rolling out new technologies regionally and nationally.

## SMART TRAFFIC MANAGEMENT

How can the deployment of intelligent traffic systems help to optimise the road network? Adaptive systems are already deployed in parts of the UK, e.g. SCOOT, and new technologies are driving their evolution and increasing their effectiveness. This case study will consider how deployment of more advanced traffic systems could support both better use of the existing road network, and future developments in road use, such as the transition to connected and autonomous vehicles.

## BIG DATA

How can we support the effective deployment of innovative data-based technologies in infrastructure? What issues are there around the collection, management, and use of infrastructure data, and what are the barriers to sharing data? What can government do to address these issues? What data challenges would be presented by a national digital twin? This case study will consider the legislative, regulatory and cultural landscape, the quality and interoperability of data, and methods for promoting the secure sharing of data, focussing in particular on the energy sector.

The key questions on which we are seeking responses through this Call for Evidence are:

## BETTER ASSET MANAGEMENT

1. What initiatives are currently underway to collate and analyse data on infrastructure assets? How can these initiatives be joined up and supported by Government?
2. What should be the immediate technology priorities to support asset optimisation and better targeted maintenance across the infrastructure sectors (transport, water, energy, digital, waste and flood defence)?
3. What are the barriers to rolling out new technologies to collate, analyse and utilise data on infrastructure assets, and how can these be addressed?
4. What are your thoughts on the capability of a national digital twin? What are the first steps to developing regional, sectoral or national digital twins? What would be the main uses of such digital twins?
5. How can Government, infrastructure providers, researchers and SMEs work together to leverage rapid innovation occurring in this space?

## SMART TRAFFIC MANAGEMENT

6. What are the latest developments in intelligent traffic systems, and what technologies underpin them?
7. What barriers do local authorities face in deploying these systems, and how could these be overcome?

## WATER EFFICIENCY

8. In your view, how can we use new and emerging technologies to address and reduce the Economic Level of Leakage (ELL) to make it more financially viable to repair more leaks?
9. Do you feel that a national and compulsory roll out of smart meters would have a positive or negative benefit in driving and delivering water efficiency and resilience within the water sector? And why?

## BIG DATA

10. What governance arrangements are needed to a) manage the huge amount of data being generated and used in the infrastructure industry and b) encourage the effective deployment of data-based technologies in the infrastructure industry (e.g. need for agreed APIs)?
11. What barriers are there to sharing data a) internally within systems and organisations and b) externally (e.g. through making data sets open to realise indirect value)? What can the government do to support the secure sharing of data in the infrastructure industry?
12. How can a national digital twin help to manage infrastructure data as an asset?

## HOW TO RESPOND

Written responses no longer than 5 pages (5 sides) to the Call for Evidence questions can be emailed to [TechnologyEvidence@nic.gsi.gov.uk](mailto:TechnologyEvidence@nic.gsi.gov.uk). Please also take our short survey: <https://www.surveymonkey.co.uk/r/CNQ8DWM>. Please provide submissions and evidence by 15 September 2017. We may publish any submissions made; if you believe there is a reason why your submission or any part of your submission should be considered confidential please provide details and mark information confidential as appropriate. The Commission is subject to legal duties which may require the release of information under the Freedom of Information Act 2000 or any other applicable legislation or codes of practice governing access to information.