consultancy engineering business environment

National Infrastructure Commission: New Technology Study (Second Call for Evidence)

ACE consultation response

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Response to consultation questions

Better asset management

Q1. What initiatives are currently underway to collate and analyse data on infrastructure assets? How can these initiatives be joined up and supported by Government?

There are a number of initiatives underway across the infrastructure sector where the collection and analysis of data is improving the operational performance of assets. The water sector is a good example where UK water companies have been collecting historical data on assets in order to use statistical modelling to predict where network failures are likely to occur and where proactive intervention is cost effective. This is being funded from price review (PR) funding and there can be a long lead time between incurring costs and reaping the benefits. These activities are made more difficult by the relatively short asset management programme (AMP) investment cycles and the reluctance of regulators to think long term.

Noting the above challenge in the water sector, the Government could encourage and facilitate funding mechanisms for infrastructure companies to implement longer term planning on the use of data to improve asset management, without any short-term disadvantages.

Q2. 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)?

An immediate priority could be the introduction of technology that supports public engagement on asset optimisation and maintenance. ACE believes the public can play an important role in collecting data on our infrastructure assets. For example, most water companies in the Netherlands have adopted a software tool called “Human Sensor” to optimise leakage detection, responses and feedback to increase service levels and to save money. The tool combines real-time information from consumers, a contact centre, maintenance and operations units, and distribution units; and then applies algorithms to determine the probable cause and location of leaks. This concept has huge potential for many infrastructure assets, particularly where the public can play a role alongside interconnected services.

Q3. What are the barriers to rolling out new technologies to collate, analyse and utilise data on infrastructure assets, and how can these be addressed?

A failure to realise the commercial benefits from collecting data on infrastructure assets, particularly over the long term, is a significant barrier preventing the rollout of these new technologies. The upfront cost, effort or time required for useful data on infrastructure assets may be turning off some asset owners from adopting this technology. ACE believes this can be addressed through a greater awareness of the long-term value of this technology. The

Government also needs to be a leader in addressing these barriers by promoting best practice through their investments in infrastructure.

There is also a skills deficit for collecting and handling data from infrastructure assets. We believe this is causing a lack of understanding on how to use these technologies to achieve operational improvements. There may be an opportunity for senior leaders to engage with younger members of the workforce to better understand how data can support better asset management and help build traction in industry to consider these technologies as 'business as usual'.

Q4. 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?

ACE is supportive of and excited by the concept of a national digital twin. Common digital standards will be critical for establishing this capability, particularly by allowing data to 'talk' to each other and be user friendly. To this end, the quality of data will need to be a key consideration, in addition to the quantity of data required, to establish a national digital twin.

ACE was not provided any views on the development and specific functions of digital twins.

Q5. How can Government, infrastructure providers, researchers and SMEs work together to leverage rapid innovation occurring in this space?

The Government, infrastructure providers, researchers and SMEs should work together to explore how new technologies can offer commercial value for infrastructure asset owners. These key stakeholders are also well placed to promote common data standards and to encourage a culture of sharing data.

ACE believes the water utility sector may be a useful current example for how various stakeholders can successfully work together to leverage and scale rapid innovation. The sector's approach to flood defence and innovative approach to optimising product and service combinations (such as software and technology) is an area currently being explored by the newly formed UK Flood Partnership.

Smart traffic management

Q6. What are the latest developments in intelligent traffic systems, and what technologies underpin them?

Recently, there has been a significant focus on understanding how vehicles will connect with one another and the roads network to ensure the introduction of autonomous vehicles is tangible. Developments are also focused on intelligent smart loading of infrastructure to monitor the capacity and provide real-time loadings of the roads network. Traffic data is

critical to underpinning these technologies and ACE believes the Government can play a role here.

Q7. What barriers do local authorities face in deploying these systems, and how could these be overcome?

The need for testing and significant legal barriers are two barriers that local authorities face when deploying intelligent traffic systems. ACE also notes that there is a need for consistency across the roads network when implementing these technologies and city regions may play a useful role here.

Some ACE members noted that the development of national standards for intelligent traffic systems may be appropriate.

Water efficiency

Q8. 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?

Tools and concepts used in other countries provide useful information on how the UK can use new and emerging technologies to address and reduce ELL and to make it more financially viable to repair more leaks. The “Human Sensor” in the Netherlands is a prime example. As discussed in the response to question 2, most water companies in the Netherlands have adopted a software tool to optimise leakage detection, responses and feedback to increase service levels and to save money. The “Human Sensor” tool combines real-time information from consumers, a contact centre, maintenance and operations units, and distribution units; and then applies algorithms to determine the probable cause and location of leaks. This concept has huge potential to significantly reduce the EEL.

Q9. 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?

ACE believes SMART meters have a role to play in a culture change to recognise the value of water and to change consumption behaviours. This becomes increasingly important as new housing developments are planned and water scarcity becomes a real concern. However, meter programmes need to be part of wider change programmes related to water efficiency and resilience. Economically, it would be a stronger argument to strengthen the governance and outcomes of the efficiency programmes.

Big data

Q10. 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)?

There is value in establishing governance arrangements on data sharing. A centrally managed approach to data sharing can consider and address some of the current concerns in the area, such as legal responsibilities, ownerships of data and any commercial elements to sharing data.

Governance arrangements can play a role in managing common data standards and performance metrics to promote consistency across the infrastructure industry. The Government should support this by developing or accrediting national standards, to ensure the high volume of data in produced in the infrastructure sector is also of a high quality. ACE believes this will encourage the uptake of these technologies by asset managers by reducing maintenance and operational challenges.

Monetarising data should be supported through governance arrangements. The value of data from infrastructure assets will continue to grow in the future as productivity and environmental pressures increase. ACE therefore believes there should be a focus on creating a clear monetary value of important data from infrastructure assets.

Q11. 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?

There are a number of legal considerations to sharing data. In addition to restrictions under the Data Protection Act 1998, infrastructure companies are wary of liability concerns from 'open sourcing' their data.

Companies are reluctant to share data that doesn't represent a success. This may distort the quality of the shared data available and prevent the infrastructure industry from learning from previous failures.

Lastly, the bespoke nature of various internal and external systems can limit the sharing of data between them. Systems are often designed with a particular purpose in mind, and it can be difficult to 'retrofit' their design to interact with other systems effectively.

The Government can address some of these barriers by managing some of the governance arrangements suggested in the response to question 10, such as managing how data is shared and encouraging data consistency across the infrastructure industry.

Q12. How can a national digital twin help to manage infrastructure data as an asset?

The concept of a national digital twin could enable a ‘virtual library’ of infrastructure data for the public’s benefit. This concept, if successfully implemented, could provide a one-stop shop for information on how our infrastructure functions, and would be extremely value for the infrastructure sector, governments, academia and the general public. This concept could also be an avenue for the uptake of common data standards, particularly if there is a mutual benefit for all stakeholders.

About ACE

As the leading business association in the sector, ACE represents the interests of professional consultancy and engineering companies large and small in the UK. Many of our member companies have gained international recognition and acclaim and employ over 250,000 staff worldwide.

ACE members are at the heart of delivering, maintaining and upgrading our buildings, structures and infrastructure. They provide specialist services to a diverse range of sectors including water, transportation, housing and energy.

The ACE membership acts as the bridge between consultants, engineers and the wider construction sector who make an estimated contribution of £15bn to the nation's economy with the wider construction market contributing a further £90bn.

ACE's powerful representation and lobbying to government, major clients, the media and other key stakeholders, enables it to promote the critical contribution that engineers and consultants make to the nation's developing infrastructure.

Through our publications, market intelligence, events and networking, business guidance and personal contact, we provide a cohesive approach and direction for our members and the wider industry. In recognising the dynamics of our industry, we support and encourage our members in all aspects of their business, helping them to optimise performance and embrace opportunity.

Our fundamental purposes are to promote the worth of our industry and to give voice to our members. We do so with passion and vision, support and commitment, integrity and professionalism.

Further information

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