# CECA Consultation response

Civil Engineering Contractors Association
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15 March 2017

Dear Sir / Madam

National Infrastructure Commission Technology Study Call for Evidence

The Civil Engineering Contractors Association (CECA) welcomes the opportunity to respond to the above named call for evidence.

CECA is the representative body for companies who work day-to-day to deliver, upgrade, and maintain the UK's transport and utility networks.

With more than 300 members throughout England, Scotland and Wales, we represent firms who together carry out up to 80 per cent of all civil engineering activity in the UK, in the key sectors of transport, energy, communications, waste and utilities including electricity and water.

Our members include some of the largest construction firms as well as a range of small specialist and regional contractors. Our industry supports the employment of over 200,000 people in the UK with annual activity worth £25 billion.

Innovation in infrastructure is about improvement and collaboration. But it is often very difficult to identify the value of its impact.

Our sector has historically been slower than others in maximising the opportunities arising from innovation. While construction spend on R&D has risen quite fast compared with the average for UK plc, it still remains at a lower level than in other sectors.

Our research shows that civil engineering contractors are taking steps to implement new opportunities in innovation, such as the adoption of digital technologies, but remain unclear as to the impact of future challenges.

The business model for the construction industry remains focussed on project and programme delivery. On the whole, innovation is undertaken by small incremental changes. It is often challenging to go further as those involved in project delivery must meet specified requirements within a tight parameter.

In our view, the opportunity for innovation varies depending on the nature of the project. Our research shows that where innovation has been successful, this has been because there has been the opportunity for longevity and the ability to form collaborative partnerships between clients and supply chains.

In order to drive forward innovation, CECA's overarching view is that a truly collaborative culture must be established across the industry to:

- Provide a welcome space for collaboration and co-investment
- Be relevant across the whole project life cycle
- Apply learning from world leading organisations

We have answered the questions where we feel that we can add the most value and our response can be found below.

Yours faithfully,

Marie-Claude Hemming
Head of External Affairs
Civil Engineering Contractors Association

1. **What are the key technologies which the NIC should take forwards to Consider for this study? Which will have the greatest potential impact over a timescale of 10 – 30 years?**

The technology to transform our industry is already here, yet uptake of innovations such as: big data, the internet of things, BIM, digital twinning, enterprise resource planning and wearable technology remains limited.

CECA believes that there is substantial potential for machine learning algorithms to be applied to construction support functions.

Artificial Intelligence is already improving and removing basic administration tasks and has the potential to go further. In our view, there is substantial benefit in applying this technology to risk management, design management and identifying the key pieces of information regarding change to projects affecting low margin industries potentially to increasing productivity.

Secondly, wide scale uptake of Blockchain has the potential to substantially change the landscape for commercial contracts, financial transactions and disrupt cash-flow business models of the industry. This could result in faster claim resolution and dispute resolution due to greater transparency.

We also note the potential benefit of the wider roll-out of: augmented reality, smart helmets, alternative manufacturing methods, and innovative products such as self-healing concrete.

Finally, we must consider the current and future impact of social media upon the way our industry communicates and interacts with society and business. To this end, we must also include the potential social value of BIM when identifying new technologies.

2. **How will these technologies meet the criteria outlined in section 3?**

CECA believes widespread adoption of new technologies will transform our industry. IT and connectivity will be paramount, and as such we must ensure that the infrastructure we build is technology enabled and capable e.g. embedding sensors in concrete.

Machine learning algorithms have the potential to enhance or substitute most of the complex tasks undertaken at office level. These include: health and safety assessments, construction sequencing and procurement logistics.

A move towards machine learning in the above case could boost productivity, increase accuracy, and substantially minimise errors.

However, the technology is currently in its early stages, with most developments occurring in learning languages, facial and image recognition, gaming theory, and predictive statistics.

The potential of machine learning algorithms comes as a result of the latest advances in hypothesis testing and complex simulations undertaken by Google, Microsoft, and MIT Labs. We also note the advances in self-driving technology.

Technologies such as IBM Watson, Google Deep Mind, Alexa, Cortana and voice activated Artificial Intelligence are transforming industries at pace, yet the biggest challenge to their roll out is a lack of engineers specialised in machine learning, meaning that these skills are, at the moment, unaffordable for our sector.

Additional challenges in the uptake of any new technology further include: human resentment, a fragmented industry, risk averse clients, poor collaboration, cost over value procurement decisions and the challenges of our existing legal system.