



National Infrastructure Commission Studies – Call for ideas response form

Name/Organisation: This response builds on established International Centre for Infrastructure Futures (ICIF) research, ICIF policy briefings and ICIF responses to earlier NIC consultations and was prepared by Dr Tom Dolan (with input from Dr Neil Carhart, Dr Ralitsa Hiteva, Dr Vedran Zerjav, Dr Nazmiye Balta-Ozkan, Dr Simon Jude, Dr Andrew Edkins) on behalf of the ICIF team.

*You have **up to 500 words** to outline the problem for a NIC study to focus on, and if you wish, to explain why this should be a priority. You must demonstrate how your suggestions fulfil the criteria outlined in this 'Call for Ideas'.*

Suggestion:

A special study to develop NIC Guidance on strategic and systemic approaches, processes or methodologies to managing infrastructure systems such that systemic principles (e.g. resilience, carbon mitigation, flood management, climate change preparedness, sustainability, inclusivity) are placed at the heart of transparent processes for infrastructure decision making.

NB: This study could be supported by current ICIF research to develop a systemic toolkit comprising a set of transparent, structured, interconnected and flexible methodologies for (i) Systemic Infrastructure Visioning, (ii) Performance and Needs Analysis, (iii) Option Identification, and (iv) Option Selection. ¹

Rationale:

1. Does the suggestion deal with a nationally significant issue?

Yes – The UK infrastructure is a complex interdependent system of systems, vulnerable to the emergence of System problems (e.g. resilience, carbon mitigation, flood management, climate change preparedness, sustainability, inclusivity). System problems are shared problems, caused by no one party in isolation, and can be solved by no one party in isolation. These problems emerge as a consequence of interaction between system components (including the political, social and economic context in which they are embedded), and are best managed collaboratively¹.

If not pro-actively anticipated and addressed such challenges, will jeopardise the ability of the National

¹ Dolan, T. and Cosgrave, E. (2016). Aligning systemic infrastructure decisions with social outcomes *Civil Engineering*, 169 (4), 147. doi: 10.1680/jcien.2016.169.4.147

Infrastructure Commission to achieve its objectives and be detrimental to the creation of a sustainable UK economy resilient to and capable of adapting to future global challenges².

2. Does the suggestion need to be considered now?

Yes – The need to take a whole system approach was recognised in the NIP and NIDP and NIA consultation, however how this has translated into practice is less clear. Therefore, the issue needs to be addressed. The significance of this issue can be illustrated through examples connected to system performance and climate change mitigation and preparedness.

System performance: The UK Council for Science and Technology (CST) concluded 7 years ago that, ‘We do not believe national infrastructure can continue on its current trajectory...and observed] delivery and governance were ‘highly fragmented’ and resilience against systemic failure was ‘significantly weakening’.³ (CST, 2009)

Climate Change mitigation and preparedness: Keith Clarke at the ICE Triennial Summit

“CLIMATE CHANGE is not like other challenges, it is STRUCTUALLY DIFFERENT..... It requires global action from ALL OF US, is time critical, and it is about managing future risks (PS: It’s also very, very inconvenient).....if we respond to the “SAME QUESTIONS with BIGGER ANSWERS. We compound towards a +4°C world.....siginificantly “THE DIFFERENT QUESTION we need to ask is NOT ADAPTATION, BUT MITIGATION OF CO2E – DRASTICALLY AND QUICKLY”⁴

3. Does the study deal with a challenging issue?

Yes – as above

4. Would any potential recommendations be realistic in terms of cost?

Typically, we only notice the true value of the economic multipliers (direct and indirect) enabled by the provision of infrastructure when the infrastructure in question fails. The above warnings indicate such failure will become more frequent, therefore, the value of establishing systemic approaches now is the future avoidance of infrastructure failure. This value needs to be considered in terms of the economic multiplier both direct and indirect enabled by systemic infrastructure decision making.

5. Would the NIC add value by considering this issue?

Yes - NIC leadership to support the development of transparent strategic systemic approaches to infrastructure decision making would set an agenda for improved infrastructure decision making. Potential benefits may include improved capability to manage the risk of system problems, opportunities to innovate in response to needs framed at the system rather than sector level, and societal benefits from explicitly aligning infrastructure decision making with social outcomes.

² CIRIA Briefing Note and Infrastructure Intelligence article [‘Infrastructure Commission: what are the opportunities and how should it work?’](#)

³ Council for Science and Technology (2009) [A National Infrastructure for the 21st century](#)

⁴ <http://www.ice-conferences.com/the-civil-engineering-triennial-summit-2015/>

Please e-mail this form to: NationalInfrastructureCommissionSpecificStudy@HMTreasury.gsi.gov.uk

The [International Centre for Infrastructure Futures \(ICIF\)](#) is an interdisciplinary, practice-orientated research centre conducting fundamental research on infrastructure interdependency, policy, innovation, regulation, management and financing. ICIF was created to identify what combinations of actors, regulations and technologies can provide for the effective planning, design, investment, construction, delivery and use of infrastructure services that underpin economic activity and improve citizens' quality of life within modern societies.

ICIF brings together leading academics from six UK universities: University College London, Cranfield University and the universities of Bristol, Brighton, Sussex and Southampton. ICIF is funded by the Engineering and Physical Sciences Research Council and the Economic and Social Research Council (Grant reference: EP/K012347/1)