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Consultancy for National Infrastructure Commission study: International best practice in
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1.   PURPOSE

1.1   The purpose of this requirement is to:

1.1.1   develop an understanding of international approaches to deploying technology to make infrastructure more productive;

1.1.2   determine good policies and market practices that have been tested and exemplified through projects, and which could be put into future use; and

1.1.3   identify market failures or market barriers which are crucial to long-term success of technology deployment across infrastructure sectors.

2.   BACKGROUND TO THE CONTRACTING AUTHORITY

2.1   The Authority (Her Majesty's Treasury) is the Government's economic and finance ministry, maintaining control over public spending, setting the direction of the UK's economic policy and working to achieve strong and sustainable economic growth.

3.   BACKGROUND TO REQUIREMENT/OVERVIEW OF REQUIREMENT

3.1   The National Infrastructure Commission ("NIC") is an independent body (an Executive Agency of HM Treasury) which provides the government with impartial, expert advice on major long-term infrastructure challenges. Whilst Her Majesty's Treasury is the Contracting Authority, all analysis and outputs in the requirement are commissioned by, and will be delivered by the successful Supplier exclusively to, the NIC. Analysis and outputs must not be shared or discussed with any party other than the NIC, without explicit NIC consent.

3.2   The NIC was set up in an interim basis on 5 October 2015 and formally became an Executive Agency of HM Treasury on 24 January 2017. The NIC's objectives are to support sustainable economic growth across all regions of the UK, improve competitiveness and improve quality of life.

3.3   The NIC has committed to delivering a National Infrastructure Assessment (NIA) once in every Parliament, which will assess the UK's long-term infrastructure needs (across a 10-30 year horizon) with recommendations to the government. The NIA covers six infrastructure sectors (transport, energy, water and wastewater, digital communication, solid waste and flood risk management), also considering their interdependencies and wider cross-cutting issues. The delivery of the NIA will be overseen by the NIC's Commissioners, appointed by the Chancellor. The NIA is being driven by an extensive programme of stakeholder engagement, including sector workshops, regional visits and social research, as well as a public call for evidence.

3.4   The focus of the NIA is on the long-term strategic plans, and therefore, it will not seek to discuss very short-term infrastructure delivery issues which are outside its scope (including current projects such as HS2, Hinkley Point C and South East airport capacity), except when these issues have strong strategic bearings on the overall long-term plans.

3.5   The NIC has also been commissioned by the Government to report on specific infrastructure challenges, which to date have included: energy innovations, London transport, Northern connectivity, mobile connectivity and the Cambridge-Milton Keynes-Oxford corridor. At Autumn Statement 2016, the Chancellor requested that the

NIC undertake a new study on how new technologies can improve infrastructure productivity.

3.6   The Chancellor asked the National Infrastructure Commission to:

3.6.1   identify which emerging technologies have the most potential in terms of optimising the management, performance and maintenance of existing and future infrastructure assets to support economic growth; and

3.6.2   make recommendations to Government on what actions it should consider to support the deployment of those technologies across infrastructure areas and sectors, including identifying where trial approaches may be appropriate.

3.7   Potential Providers should read both the NIC's February 2017 Call for Evidence for the technology study, as well as HM Treasury's Terms of Reference for the study, in order to understand the broader context for this requirement and inform their response.

4.   DEFINITIONS

Expression or Acronym	Definition
Infrastructure sectors	The sectors which fall under the NIC's remit, namely: transport, energy, water & wastewater, digital communication, solid waste and flood risk management.
Infrastructure productivity	The performance of infrastructure systems, determined by the management, operation and maintenance of these systems.
Leapfrogging technologies	Technologies which allow skipping of stages in the established development of infrastructure systems.
New technologies	Digital technologies already at a level of readiness to allow for full deployment, i.e. realising the maximum gains from implementation, over the next 10-30 years.
Smart cities and smart infrastructure	Infrastructure and urban systems that embed digital technologies in order to improve the productivity of these systems.

5.   SCOPE OF REQUIREMENT

5.1   The NIC is interested in new technologies which have the most potential in terms of optimising the management, performance and maintenance of infrastructure assets to support economic growth. This report should set out a number of international case studies to inform the NIC's new study, by considering international approaches to the deployment of new technologies. The report should clearly identify which infrastructure issues or problems a given technology is intended to address.

5.2   In particular, the Potential Provider should consider: Estonia, France, Hong Kong, Japan, Singapore, South Korea, Sweden and UAE. The Potential Provider should also consider case studies which demonstrate the effectiveness of leapfrogging technologies.

5.3   The NIC is particularly interested in different international approaches to the concept of creating smart cities and smart infrastructure. The successful Supplier should look

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across sectors and across technologies to identify what different countries are doing at the urban and regional levels to make their infrastructure 'smart', and to identify which are the most effective strategies and approaches.

5.4 The key questions to be answered are:

5.4.1 which digital technologies have been identified and prioritised, and which infrastructure issues are they intended to address?

5.4.2 What are the obstacles to take-up of these technologies, and what benefits can be realised by accelerating technology deployment?

5.4.3 What steps have been taken to support the deployment of these technologies?

5.4.4 What has been the role of governments?

5.5 The successful Supplier, at the project inception meeting, will provide a long-list of international examples, from which a short-list of case studies will be agreed with the NIC. These case studies should assess the benefits of government interventions, using both quantitative and qualitative analyses, to consider:

5.5.1 the costs and benefits, with an assessment of the impact of the case study (expected, and where relevant, actual in a qualitative and where possible quantitative sense);

5.5.2 the suitability of government policies in support of these aims; and

5.5.3 evaluation of progress and barriers to success.

5.6 The report must also assess how the impacts of new technologies on infrastructure sectors will be affected by sectoral interdependencies, as well as any implications for the built environment.

5.7 Some of the case studies will be reporting on work in progress or prospective plans, and the successful Supplier will set out a view on the likelihood of success. Some of this analysis will form advice to the NIC that will not be published.

5.8 New digital technologies are the focus of this study, with specific interest in:

5.8.1 blockchains and distributed ledger systems;

5.8.2 big data;

5.8.3 digital twins;

5.8.4 internet of things;

5.8.5 machine learning and artificial intelligence;

5.8.6 sensing; and,

5.8.7 virtual and augmented reality.

5.9 This list of technologies is not exhaustive, and others may be explored by the successful Supplier, subsequent to agreement with the NIC. Also of interest are technologies that make digital connectivity more productive. The successful Supplier should focus only on technologies which are expected to enhance the productivity of the relevant infrastructure sectors.

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5.10   It may be informative to understand past failures, which could highlight unsuccessful approaches, as well as the main barriers and challenges to implementing technological change. Evaluation of past examples of digital technology deployment therefore may be appropriate, both for successful approaches and those that did not deliver their goals, and may be included following agreement with the NIC.

5.11   Excluded from the scope of this requirement is:

5.11.1   digital infrastructure requirements - both passive and active - that underpin the digital technologies in question. This includes any issues regarding development or deployment; and,

5.11.2   assessment of risks and vulnerabilities associated with widespread diffusion of digital technologies and digitally-connected infrastructure systems.

6.   THE REQUIREMENT

6.1   A report, finished to a publishable standard is to be delivered by 2 August 2017.

6.2   The report should be presented in three sections:

6.2.1   the first section will identify a long-list of international examples of support for deployment of new technologies to improve infrastructure productivity, as well as the infrastructure challenge intended to be met;

6.2.2   the second section will address an agreed short-list of examples as case studies, in line with the scope set out in Section 5. This will include how these technologies impact upon infrastructure sectors and their productivity, the implications of interdependencies between infrastructure sectors, as well as potential impacts between infrastructure sectors and the built environment.

6.2.3   the third section will summarise findings, including cost-benefit analyses to identify the lowest value and highest value interventions, and an assessment of associated risks. This section should include consideration of similarities and differences between international approaches to common infrastructure challenges.

7.   KEY MILESTONES

7.1   The Potential Provider should note the following project milestones that the Authority will measure the quality of delivery against:

Milestone	Description	Timeframe
1	Project inception meeting with the NIC, to agree the milestones for the project and precise coverage of the report.	Within week 1 of Contract Award By 5th July
2	An inception report to be provided, and agreed by the NIC, clarifying the approach to be taken, along with a plan setting out key milestones and dates for deliverables, risks and how these will be managed.	Within week 2 of Contract Award By 12th July

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3	Update meeting / phone call on the project including any findings or assumptions to agree upon.	Weekly
4	Presentation of long-list of international examples.	Within week 2 of Contract Award By 12th July
5	Agreement of short-list for case studies of international examples.	Within weeks 2-3 of Contract Award By 19th July
6	Development of case studies.	Within weeks 2-3 of Contract Award By 19th July
7	Presentation of cost-benefit analyses for the short-listed examples used for case studies.	Within weeks 3-4 of Contract Award By 26th July
8	First draft of final report to be shared with the NIC.	Within week 4 of Contract Award Between 26th July – 1st August
9	Final version of the report suitable for publication.	By 2nd August 2017

7.2   The above timetable is subject to change, assumes a contract award of 28th June 2017 and is dependent upon key gateway points being met in terms of receiving information from the customer and obtaining all required approvals.

8.   AUTHORITY'S RESPONSIBILITIES

8.1   The NIC will share pertinent information received through relevant stakeholders and introduce the successful Supplier to relevant stakeholders, which can offer valuable advice on the requirement.

9.   REPORTING

9.1   As set out in Section 7 (Key Milestones). Additionally, the successful Supplier will be expected to update the NIC on project progress on at least a weekly basis via a meeting or phone call, including to flag any issues or early findings.

10.   VOLUMES

10.1   This is a substantial piece of work – the expectation is that the key outputs and related materials will be both extensive and of publishable standard.

11. CONTINUOUS IMPROVEMENT

11.1 The successful Supplier will be expected to give due consideration to the way in which the required Services are to be delivered throughout the Contract duration and can be continually improved.

11.2 Changes to the way in which the Services are to be delivered must be brought to the NIC's attention and agreed prior to any changes being implemented.

12. QUALITY

13.1 The NIC will be looking to cite this report's findings in its study on new technologies. Outputs should therefore be to a publishable standard, with all assumptions and caveats clearly highlighted.

13.2 The source of data and assumptions, as well as advice on its robustness, should be clearly set out, and it will need to be demonstrated how the findings have been suitably quality assured. The report will need to be a self-standing piece that can set out its analysis and justify its conclusions to leading experts in the fields of digital technologies and infrastructure.

13. PRICE

13.1 Prices are to be submitted via the e-Sourcing Suite in the price questionnaire.

13.2 Bids for the full requirement are expected to range between £10,000 and £100,000.

13.3 Prices should be inclusive of all expenses and exclusive of VAT.

14. STAFF AND CUSTOMER SERVICE

14.1 The NIC requires the successful Supplier to provide a sufficient level of resource – with sufficient but not excessive senior involvement and oversight – throughout the duration of the Contract in order to consistently deliver a quality service to all Parties at value for money.

14.2 The successful Supplier's staff assigned to the Contract shall have the relevant qualifications, experience and expertise to deliver the Contract. The NIC does not prescribe any single set of minimum requirements in terms of skills or qualifications, but the successful Supplier must demonstrate as part of its bid that its delivery team contains staff with sufficient expertise and skills.

14.3 The successful Supplier will not replace staff members in the team which was assembled and presented in the bidding process without informing and getting consents from the NIC.

14.4 The successful Supplier shall ensure that staff understand the NIC's vision and objectives and will provide excellent customer service to the NIC throughout the duration of the Contract.

15. SERVICE LEVELS AND PERFORMANCE

15.1 The targets set out below assume that the contract will be awarded by 28th June 2017. The NIC will measure the quality of the Supplier's delivery by:

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KPI/SLA	Service Area	KPI/SLA description	Target
#1	Agreed approach	Clarifying the approach to be taken, along with a plan setting out key milestones and dates for deliverables, risks and how these will be managed, etc.	5th July 2017
#2	Output from Interim Report for Requirement 6.1 and 6.2	A draft report addressing the issues set out in the requirement including the first draft of analysis, views and findings.	26th July 2017
#3	Outputs from the Final Report, in publishable form	A final report cover the key outputs described in the requirement.	2nd August 2017

16. SECURITY REQUIREMENTS

16.1 Due care must be taken by the successful Supplier to protect the confidentiality of all analysis and outputs (including in development and draft phases) relating to this requirement, to avoid pre-empting the NIC's placement of the final report in the public domain.

17. INTELLECTUAL PROPERTY RIGHTS (IPR)

17.1 All analysis (including any calculations and models) used to generate the outputs should be provided to the NIC for future use. This analysis, and the interim and final reports, will be the property of the NIC. The successful Supplier must not disclose the report (either in part or in full) to any third parties prior to publication by the NIC, unless the NIC gives express consent to do so.

18. PAYMENT

18.1 Payment can only be made following satisfactory delivery of the pre-agreed certified products and deliverables. Payment will be made in arrears, subject to invoice(s) being submitted for work carried out.

18.2 Before payment can be considered, invoice(s) must include a detailed elemental breakdown of work completed and the associated costs.

19. ADDITIONAL INFORMATION

19.1 The successful Supplier should demonstrate that they are open to working collaboratively with other suppliers, contracted by the NIC in order to deliver related pieces of analysis.

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20.   LOCATION

20.1   The location of the Services will be carried out at the offices of the successful Supplier. However frequent meetings will need to take place with the National Infrastructure Commission at the successful Supplier's offices, or at the NIC's offices (currently at Eastcheap Court 11 Philpot Lane, London EC3M 8UD) and meeting spaces at 1 Horse Guard Road, London SW1A 2HQ.

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