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**CONTENTS**

1.	PURPOSE.....	2
2.	BACKGROUND TO THE CONTRACTING AUTHORITY.....	2
3.	BACKGROUND TO REQUIREMENT/OVERVIEW OF REQUIREMENT .....	2
4.	DEFINITIONS.....	3
5.	SCOPE OF REQUIREMENT.....	3
6.	THE REQUIREMENT.....	4
7.	KEY MILESTONES .....	5
8.	AUTHORITY'S RESPONSIBILITIES.....	5
9.	REPORTING.....	5
10.	VOLUMES.....	5
11.	CONTINUOUS IMPROVEMENT .....	5
12.	SUSTAINABILITY .....	5
13.	QUALITY.....	6
14.	PRICE .....	6
15.	STAFF AND CUSTOMER SERVICE.....	6
16.	SERVICE LEVELS AND PERFORMANCE .....	6
17.	SECURITY REQUIREMENTS.....	7
18.	INTELLECTUAL PROPERTY RIGHTS (IPR) .....	7
19.	PAYMENT.....	7
20.	ADDITIONAL INFORMATION.....	7
21.	LOCATION.....	7



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## 1. PURPOSE

- 1.1 The aim of this work is to deliver a report that sets out a clear assessment of the existing infrastructure in the UK which could enable future wireless networks to emerge and any challenges that might be associated with exploiting that infrastructure fully and in a timely way.

## 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 enabling long term strategic decision making to build effective and efficient infrastructure for the UK.
- 3.2 The NIC was set up on 5 October 2015 and will look at the UK's future needs for nationally significant infrastructure, help to maintain UK's competitiveness amongst the G20 nations and provide greater certainty for investors by taking a long term approach to the major investment decisions facing the country.
- 3.3 The NIC will deliver a long-term plan and assessment of national infrastructure needs early in each parliament, setting out what a government is expected to do over the next five years. It will be overseen by a small board, appointed by the Chancellor, and able to commission research and call for evidence from public sector bodies and private sector experts.
- 3.4 The Commission will publish advice to the government on the 5G infrastructure challenges before the end of 2016. As well as the studies mentioned the Commission has also begun work on a national infrastructure assessment, looking ahead to requirements for the next 30 years.
- 3.5 Recently the NIC has been tasked by the Chancellor with delivering two reports providing advice on distinct infrastructure challenges:
- 5G: considering what the UK needs to do to become a world leader in 5G deployment.
- 3.6 The "fifth generation" of telecommunications systems, or 5G, will mark a step change in digital communications. It will change the way people, institutions and objects interact. 5G will provide virtually ubiquitous, ultra-fast connectivity not only to individual users but also to connected objects, supporting a wide range of advanced technologies likely to include connected and autonomous vehicles, eHealth, energy management and smart cities.
- 3.7 The Commission will consider what the UK needs to do to become a world leader in the deployment of future communications networks such as 5G, and what the UK can do to take early advantage of the potential applications of 5G services. The



Commission will publish advice to the government on the 5G infrastructure challenges before the end of 2016.

- 3.8 The aim of this work is to deliver a view on existing infrastructure in the UK which could enable future wireless networks to emerge and any challenges that might be associated with exploiting that infrastructure fully and in a timely way.
- 3.9 To inform the 5G report the NIC has identified a requirement for consultancy to deliver a view on existing infrastructure in the UK which could enable future wireless networks to emerge and any challenges that might be associated with exploiting that infrastructure fully and in a timely way. This consultancy work will need to take account of the parallel work the Authority is commissioning on 5G use-cases & coverage scenarios and the requirements these imply.
- 3.10 The study should enable an understanding of where existing infrastructure could play a part in future mobile networks and where this could take us to in terms of coverage and capability. It will highlight the areas which need to be focused on to enable such infrastructure to be exploited fully, giving insight to the key questions around enabling future wireless networks such as 5G - for example what further measures if any are necessary to enable widespread deployment of small cells on street furniture and where are the key bottlenecks.

#### 4. DEFINITIONS

Expression or Acronym	Definition
5G	The next generation of mobile telecoms network technology

#### 5. SCOPE OF REQUIREMENT

- 5.1 The following section provides further detail regarding the requirement.
- 5.2 To analyse the existing infrastructure holdings in the UK which are pertinent to enabling future wireless networks such as 5G, addressing each of the key areas - for example an increased need for fibre optic cabling to enable small cell 'densification' or enabling wireless networks to deploy and evolve along the UK road and rail networks. The study should cover all major public bodies' holdings.
- 5.3 The study should provide a contextual overview of the current infrastructure adoption within wireless networks – covering for example what infrastructure arrangements existing major wireless network operators adopt for sites and backhaul. It should summarise the existing infrastructure usage in the major existing wireless networks (2G/3G/4G/WiFi etc).
- 5.4 The study should deliver a view, with reference to the parallel consultancy work on 5G use-cases, on the infrastructure holdings which could play a part in each of these use-cases. To identify where the key challenges lie in exploiting the infrastructure (for example around site or pole access, or fibre deployments) and investigate the opportunities for and barriers preventing sharing of this infrastructure. Clearly identify where infrastructure is in public versus private ownership, and where access is available in the current market place, versus that which is currently inaccessible



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or remains underutilised whether in public or private ownership. It should identify the timetables by which existing infrastructure may need to be accessible to networks to enable the use-cases.

- 5.5 The study should address the technical details and constraints relevant to any infrastructure, covering whether there is anything which would limit its use in mobile networks to address any of the use-cases – for example latency or capacity constraints.
- 5.6 The study should map the existing infrastructure holdings relevant to enabling future mobile networks such as 5G - and their ownership - particularly where owned by firms in other sectors e.g. public sector assets, utility network owners, Network Rail, Highways England etc. All major public bodies' holdings should be covered. The study should summarise how far would access to existing market accessible backhaul combined with the other infrastructure identified in this study take you in terms of coverage and capability. A view should be given in tender responses on what level of analysis is viable in this study.

## 6. THE REQUIREMENT

- 6.1 The key outputs from this project will be:
- 6.1.1 A contextual overview of the current infrastructure use and arrangements adopted by major wireless network operators.
  - 6.1.2 An overview of the existing infrastructure holdings in the UK which are pertinent to enabling future wireless networks such as 5G.
  - 6.1.3 Mappings of the existing infrastructure holdings relevant to enabling future mobile networks such as 5G and their ownership - particularly where owned by firms in other sectors e.g. public sector assets, utility network owners, Network Rail, Highways England etc.
  - 6.1.4 A description of the existing infrastructure holdings which could play a part in each of the use-cases and coverage scenarios developed from the parallel consultancy project on 5G use-cases.
  - 6.1.5 A detailed description of where the key infrastructure challenges lie and the opportunities for and barriers preventing sharing of this infrastructure.
  - 6.1.6 All calculations and models used to generate the analysis should be provided to the Authority for future use.
- 6.2 The Commission is also seeking to procure work looking at the potential use cases for 5G in the UK and the infrastructure needs these imply. Given the strong links between all three projects, it will be important for the successful Provider leading this project to collaborate as appropriate with the firms conducting the other projects.
- 6.3 The NIC is undertaking consultancy projects looking at both the potential uses and services that may be provided by 5G mobile telecoms networks and the market arrangements that will support investment. These studies are closely related to the

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study on 5G infrastructure requirements. The successful bidder should expect to work closely with the firms leading these other studies.

- 6.4 The Commission will be looking to cite the findings from both work streams in its report to the Government in the spring. The reports should therefore be to a publishable standard, with all assumptions and caveats clearly highlighted.
- 6.5 The source of data and assumptions, and advice on its robustness, should be clearly set out, and it will need to be demonstrated how the findings have been suitably quality assured, including through peer review and audit.

## 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 kick-off meeting, to agree the time line for the project and precise coverage of the report.	Within week 1 of Contract Award
2	Update meeting / phone call on the project including any early findings	Weekly
3	First draft of the report including any key recommendations / findings	w/c 19 September 2016
4	Final version report of the report suitable for publication	w/c 31 October

## 8. AUTHORITY'S RESPONSIBILITIES

- 8.1 The National Infrastructure Commission will share pertinent information from the other 5G research projects as well as information gathered through its 5G call for evidence.

## 9. REPORTING

- 9.1 N/A

## 10. VOLUMES

- 10.1 N/A

## 11. CONTINUOUS IMPROVEMENT

- 11.1 N/A

## 12. SUSTAINABILITY

- 12.1 N/A



**13. QUALITY**

- 13.1 The Commission will be looking to cite the findings from both workstreams in its report to the Government in the spring. The reports should therefore be to a publishable standard, with all assumptions and caveats clearly highlighted.
- 13.2 The source of data and assumptions, and advice on its robustness, should be clearly set out, and it will need to be demonstrated how the findings have been suitably quality assured, including through peer review and audit.

**PRICE**

- 13.3 Prices should be inclusive of expenses and exclusive of VAT.
- 13.4 The maximum budget for the full requirement is £100,000.
- 13.5 Prices are to be submitted via the e-Sourcing Suite excluding VAT.

**14. STAFF AND CUSTOMER SERVICE**

- 14.1 The Authority requires the Potential Provider to provide a sufficient level of resource throughout the duration of the 5G Infrastructure Contract in order to consistently deliver a quality service to all Parties.
- 14.2 Potential Provider’s staff assigned to the 5G Infrastructure Contract shall have the relevant qualifications and experience to deliver the Contract.
- 14.3 The Potential Provider shall ensure that staff understand the Authority’s vision and objectives and will provide excellent customer service to the Authority throughout the duration of the Contract.

**15. SERVICE LEVELS AND PERFORMANCE**

- 15.1 The Authority will measure the quality of the Supplier’s delivery by:

KPI/SLA	Service Area	KPI/SLA description	Target
#1	Agreed approach	An inception report to be provided, and agreed by 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, etc.	Within 1 week of contract award
#2	Key outputs delivered in draft	A first draft of the report including the key outputs set out in 6.1	By w/c 19 Sept 2016
#3	Key outputs in final, publishable form	A final report including the outputs set out in 6.1	By w/c 31 Oct 2016



**16. SECURITY REQUIREMENTS**

16.1 N/A

**17. INTELLECTUAL PROPERTY RIGHTS (IPR)**

17.1 N/A

**18. PAYMENT**

18.1 Payment can only be made following satisfactory delivery of pre-agreed certified products and deliverables.

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

**19. ADDITIONAL INFORMATION**

19.1 N/A

**20. LOCATION**

The location of the Services will be carried out at the offices of the supplier – however frequent meeting will need to take place with the National Infrastructure Commission who are based at 5th Floor, Eastcheap Court, 11 Philpot Lane, EC3M 8AA. Meeting may also be held at 1, Horse Guards Rd, London SW1A 2HQ from time to time if required.