



---

**CONTENTS**

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



## 1 PURPOSE

- 1.1 The purpose of this Procurement is to source a Potential Provider that will provide the National Infrastructure Commission (NIC) (henceforth the ‘Authority’) with transport connectivity metrics. These should be based on a sound theoretical framework and will be applied to provide a meaningful assessment of the performance of the inter-city and intra-city transport networks.

## 2 BACKGROUND TO THE CONTRACTING AUTHORITY

- 2.1 The Authority provides the government with impartial, expert advice on major long-term infrastructure challenges. It has been operating in interim form since October 2015 and was established as a permanent Executive Agency of HM Treasury on 24 January 2017.
- 2.2 The Authority’s relationship with the government is set out in a published [Charter](#). This explains that it must carry out its work in accordance with a remit (and terms of reference for specific studies) set by the government. In all other respects it has complete discretion to determine independently its work programme, methodologies and recommendations, as well as the content of its reports and public statements. A mutually agreed [Framework Document](#) provides further details of the Authority’s working relationship with the government.
- 2.3 The government has outlined the high-level objectives of the Authority as follows:
- 2.3.1 Support sustainable economic growth across all regions of the UK;
  - 2.3.2 Improve competitiveness
  - 2.3.3 Improve quality of life
- 2.4 Each Parliament, the Authority will deliver a study on the UK’s long-term strategic infrastructure needs and produce recommendations to address those needs across the economic infrastructure sectors including transport, energy, water and wastewater, digital communications, solid waste, flood risk management as well as considering their interdependencies and their interaction with the built environment.
- 2.5 This study is the National Infrastructure Assessment (NIA). The delivery of the NIA will be overseen by the Authority’s Commissioners, who can commission research and call for evidence from public sector bodies and private sector and other third party experts.
- 2.6 The NIA will consist of two stages: an interim report [Congestion, Capacity, Carbon: Priorities for National Infrastructure](#), identifying the vision and long-term infrastructure needs, published on 13 October 2017; and the National Infrastructure Assessment, a roadmap of recommendations including both policy and infrastructure solutions to be published in mid-2018.
- 2.7 The Authority has undertaken a NIA consultation in order to develop the best process and methodology of the assessment. The consultation has now closed. The Authority intends to consult on the priorities outlined in the *Congestion, Capacity, Carbon: Priorities for National Infrastructure* document for a period of 3 months.
- 

OFFICIAL



2.8 To understand the broader context for this requirement and to inform their response Potential Providers should read:

- a) The [NIC’s consultation on the NIA](#) and [HM Treasury’s response](#) to its consultation on NIA;
- b) The Authorities interim publication, [Congestion, Capacity, Carbon: priorities for national infrastructure](#). With particular regard to the Introduction and Annex A, which consider infrastructure performance measures.
- c) The [analysis undertaken for the NIC’s High Speed North report](#), assessing the productivity benefits of improving inter-city connectivity in Northern England.

### 3 BACKGROUND TO REQUIREMENT/OVERVIEW OF REQUIREMENT

- 3.1 With its objectives in mind, the Authority intends to develop a small set of infrastructure performance indicators to quantitatively assess the current performance and shortcomings of infrastructure services across the country. The indicators will provide a proxy for measuring the Authority’s progress against its objectives and will be used to inform its strategic decisions. The proposed set of infrastructure performance measures, which the Authority is consulting on, is summarised in Annex A of *Congestion, Capacity, Carbon: priorities for national infrastructure*.
- 3.2 One of the key mechanisms through which infrastructure services can affect economic growth, competitiveness and quality of life is through improvements in transport networks. As discussed by the Authority in its paper focused on [economic growth](#), transport connectivity may directly increase productivity, lower costs for firms, improve access to supply chains, enable exports and deliver agglomeration economies. In addition, transport services allow people to access work, education and health services, leisure, family and community which matters for quality of life.
- 3.3 Transport connectivity is understood by the Authority to represent the effectiveness of the transport network (irrespective of mode) at getting people from one location to another. This in turn will depend on the time within which a number of individuals can reach different destinations via the transport network.
- 3.4 The Authority requires research that will help to develop and produce transport performance indicators to indicate transport connectivity. These must be based on a sound theoretical framework. This work is necessary for the Authority’s ability to make objective and evidence-based policy recommendations on the priorities for transport investment. It is expected that the indicators will be used to inform the Authority’s assessment of the performance of inter-city and intra-city transport, and recommendations relating to this.

### 4 DEFINITIONS

Expression or Acronym	Definition
Inter-city connectivity	Effectiveness of the transport network at getting people between different places in the country.



Intra-city connectivity	Effectiveness of the transport network at getting people into the centre of a city.
NIA	National Infrastructure Assessment
NIC	National Infrastructure Commission
Peak time	The hour(s) of day with the biggest number of vehicles on the road or passengers on the railways.
Primary urban area (PUA)	A measure of the built-up area of a city. These correspond to the UK's 63 largest towns and cities.
Transport connectivity	Effectiveness of the transport network (irrespective of mode) at getting people from one location to another.

## 5 SCOPE OF REQUIREMENT

- 5.1 The Authority is seeking a Potential Provider to develop transport connectivity metrics at three different spatial levels as outlined within Section 5.6 below. The Potential Provider must both construct the metrics, based on a sound theoretical framework, and quantify current connectivity as per the metrics' definitions. The Authority would also like the Potential Provider to quantify historic connectivity, if the data used allows for this.
- 5.2 The connectivity indicators must allow the Authority to identify current pressures on the transport network, and should be able to pick up constraints based on the transport network itself (i.e. places that have poor connectivity because their most direct transport links are poor) as well as capacity issues (i.e. speeds between certain places are low because of congestion).
- 5.3 The starting point for the theoretical construct for this metric is the calculation of "market potential" described by [Harris \(1954\)](#). This sets out that the market potential for a city can be measured as the sum of the market potential for all other cities (or the economic mass, M) in the area under consideration (which could be a country or major region) divided by the transport cost of reaching each city (which can be proxied by distance, d). Simply put:

$$\text{market potential} = \frac{\sum M}{d}$$

- 5.4 The metric above gives an indication of the demand which can be accessed from a given city, controlling for distance. As the Authority is interested in the infrastructure which allows this distance to be travelled, rather than just the physical geography, it would like a time element to be included in the metric. The metric could therefore be constructed along the following lines:

$$C_{it} = \frac{\sum M_{jt} \cdot t_{jt}}{d_j}$$

Where:

$C_{it}$  = connectivity of place  $i$ , in year  $t$

$i$  = origin

OFFICIAL



$j = \text{destination}$

$M_{jt} = \text{share of demand in place } j, \text{ in year } t$

$t_{jt} = \text{travel time between } i \text{ and } j, \text{ in year } t$

$d_j = \text{crow flies distance between } i \text{ and } j$

- 5.5 The Authority would like the Supplier to construct all metrics based on a sound theoretical justification, and there is therefore scope for the Potential Provider to suggest different constructs for the metrics than those proposed above. The formula used will be agreed between the Authority and the Potential Provider.
- 5.6 The Authority would like the connectivity indicator to be constructed at three levels:
1. **Within cities** – this should provide a single connectivity index for each city in Great Britain, as measured by the speed of travel by road or rail between each point in the city and its centre, weighted by demand in each point. The unit of analysis corresponding to cities should Primary Urban Area (PUA), as per the Centre for Cities' definition, which includes 156 cities. The Potential Provider should recommend a definition for the centre of each city.
  2. **Between cities and other locations** – this should indicate the speed of travel by road or rail from each place in Great Britain, and all other places, weighted by demand in the destination places. There should be a single connectivity index for each place. The Authority would like the Potential Provider to recommend the unit of analysis which allows for the inclusion of all the cities in Great Britain, but also large towns etc.
  3. **Between cities and international destinations** – this should indicate the speed of travel between each city in Great Britain and cities in the rest of the world, weighted by demand in the international destinations. The Potential Provider should suggest the international destinations and modes of travel which should be included in this metric. Please note that for Level 3 the Authority only require a concept of the suggested indicator and how this would be allocated.
- 5.7 The metric should be provided for connectivity across modes (i.e. fastest time between two points by **either road or rail**) and broken down by mode (i.e. fastest time between two points by road; fastest time between two points by rail).
- 5.8 The Authority would like the Potential Provider to construct all three metrics, based on a sound theoretical framework. The Authority would also like the Potential Provider to calculate current connectivity within cities (metric 1) and between cities and other locations (metric 2). The Potential Provider is not expected to calculate international connectivity (metric 3).
-



- 5.9 The Authority would like a version based on peak time and another based on free flow conditions to understand the impact of capacity pressures on the network at peak times. An analysis of the variance in travel connectivity at a given time is expected to provide interesting insights into travel reliability and congestion.
- 5.10 The dataset used to construct the indicators will be agreed on between the Potential Provider and the Authority. If the Potential Provider already has access to data on journey times for motorised road and rail trips this may be used, if not the Authority will ensure that the Potential Provider can get access to the required data.
- 5.11 All assumptions made must be clearly stated and agreed upon by the Authority.

## **6 THE REQUIREMENT**

- 6.1 The key outputs from this project are transport connectivity indicators which can be used to assess the performance of the UK's transport networks. The outputs should include:
- 6.1.1.1 Descriptive analysis of the three connectivity indicators produced, how they were calculated and their theoretical justification; summarised in a report which is of publishable standard. This should include a summary of any assumptions and limitations of the analysis undertaken for all Levels detailed within Section 5.6 above;
  - 6.1.1.2 Analysis of current (and historic, if possible) connectivity within Great Britain's cities (as per the PUA definition) and between cities and other locations. This should include a summary of key findings and data in spreadsheet format.
- 6.2 First drafts of these products must be delivered no later than 27<sup>th</sup> March 2018 to ensure that the findings of the report can be used to inform the NIA. Delivery will be staggered, with initial high level outputs being supplied to the Authority by 27<sup>th</sup> February with 24<sup>th</sup> April an absolute deadline for all products. The Potential Provider must therefore ensure that, following feedback and comments by the Authority of the first draft interim findings a second draft findings can be provided by 13<sup>th</sup> March 2018.
- 6.3 At the start of the project the Authority expects to hold an inception/scoping meeting with the Supplier. Following this meeting a short inception report should be provided by the Supplier which clarifies the approach to be taken, along with a succinct plan setting out key milestones and dates for deliverables. The Authority and Supplier must agree on this inception report before proceeding to carry out the analysis. The Authority expects to work closely with the Supplier, including through fortnightly meetings or phone calls.
- 6.4 The Supplier will present the report to technical and non-technical members of the Authority in a clear and concise fashion. The purpose of this is to set out the key findings from the report, and the main assumptions, results and caveats to ensure these are fully understood by Commissioners. The Supplier must also present the second draft of the interim findings and the first draft of the report to a roundtable of external experts, set up by the Authority, for peer review and quality assurance.
- 6.5 The Supplier must submit a final report detailing analysis, findings and comments in a clear and concise fashion – this should reflect any inputs/requests made by the Authority
-



during the production phase and comments from the expert roundtable. This should include the points outlined in paragraph 6.1.

- 6.6 The Authority intends to publish the final report and associated documents, as well as the relevant findings in spreadsheet format.

## 7 KEY MILESTONES

- 7.1 The Potential Providers 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 Authority to agree deliverables and timelines	Within week 1 of Contract Award
2	Inception report submitted to the Authority outlining the methodology and deliverables	Within week 2 of Contract Award
3	Update meetings/phone calls/email correspondence to discuss assumptions, findings and progress	Fortnightly
4	First draft of interim findings to be shared with the Authority	Within week 6 of Contract award
5	Second draft of interim findings to be shared with the Authority	Within week 8 of Contract Award
6	Draft report to be submitted to the Authority	Within week 10 of Contract Award
7	Presentation of interim findings and analysis to Authority and external experts of peer review and quality assurance	Within week 12 of Contract Award
8	Final report and supporting analysis to be shared with the Authority	Within 14 weeks of Contract Award

## 8 AUTHORITY'S RESPONSIBILITIES

- 8.1 The Authority will share pertinent information received through relevant stakeholders and introduce the Supplier to relevant stakeholders, which can offer valuable advice on the requirement.
- 8.2 The Authority will also provide access to the relevant data, if necessary.

## 9 REPORTING

- 9.1 As set out in Section 7 (Key Milestones). Additionally, the Supplier will be expected to update the Authority on project progress on at least a fortnightly 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 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 Authority's attention and agreed prior to any changes being implemented.
- 11.3 The Supplier must present new ways of working to the Authority during the weekly update meetings/phone calls.

## **12 SUSTAINABILITY**

- 12.1 There are no sustainability considerations applicable to this requirement, beyond those already expressed in the Appendix C Terms and Conditions Document.

## **13 QUALITY**

- 13.1 The recommendations to the government in the National Infrastructure Assessment (NIA) publication will be informed by this report. The preliminary findings must first be presented to the Authority by 27th February 2018 for feedback, with the second draft interim findings provided by 13th March 2018. The Supplier should submit a first draft of the final report by 13th March 2018; the final report must be submitted to the Authority by 24th April 2018; this report must be to a publishable standard, with all assumptions and caveats clearly highlighted and referenced appropriately.

## **14 PRICE**

- 14.1 Prices are to be submitted via the e-Sourcing Suite by completing and uploading a completed Appendix E – Pricing Schedule excluding VAT.
- 14.2 The Authority expects to be able to complete this requirement for between £10,000.00 and £30,000.00.
- 14.3 Prices should be inclusive of expenses and exclusive of VAT.

## **15 STAFF AND CUSTOMER SERVICE**

- 15.1 The Authority requires the Supplier to provide a sufficient level of resource throughout the duration of the Contract to consistently deliver a quality service to all Parties.
- 15.2 The Supplier's staff assigned to the Contract shall have the relevant qualifications and experience to deliver the Contract. The Authority does not prescribe any single set of minimum requirements in terms of skills or qualifications, but the Potential Providers must demonstrate as part of their bids that their delivery team contains staff with sufficient expertise and skills.
- 15.3 The Supplier 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.



## 16 SERVICE LEVELS AND PERFORMANCE

16.1 Where there are any milestones in brackets, these are relating back to Section 7 of this document.

16.2 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 the Authority, 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
#2	Attendance at fortnightly updates	The Supplier will attend all fortnightly meetings. If the Supplier is unable to attend a scheduled meeting they will alert the Authority and reschedule with at least 1 weeks’ notice.	98%
#3	Responding to queries	The Supplier will respond to any query from the Authority within 48 hours.	98%
#5	Amendments to drafts	Following comments from the Authority, the Supplier will make minor amendments to drafts within 1 week and major amendments within 2 weeks.	98%

16.3 The Supplier’s performance will be monitored and assessed through regular project update meetings with the Project Manager, review of progress against the agreed project timeline and through review of deliverable products. Meetings with the Project Manager will occur at least once in every 2 week period.

16.4 Where the Authority identifies poor performance against the agreed SLA’s, the Supplier shall be required to attend a performance review meeting. The performance review meeting shall be at an agreed time no later than 5 working days from the date of notification at the Authority’s premises.

16.5 The Supplier shall be required to provide a full incident report, which describes the issues and identifies the causes. The Supplier will also be required to prepare a full and robust ‘Service Improvement Action Plan’, which sets out its proposals to remedy the service failure. The Service Improvement Plan shall be subject to amendment following the performance review meeting and agreed by both parties prior to implementation.



## **17 SECURITY REQUIREMENTS**

17.1 Due care must be taken by the 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 Authority's placement of the final report in the public domain.

## **18 INTELLECTUAL PROPERTY RIGHTS (IPR)**

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

## **19 PAYMENT**

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

19.2 Before payment can be considered, invoice(s) must include a detailed elemental breakdown of work completed and the associated costs. The address for invoices should be: Eastcheap Court 11 Philpot Lane, London EC3M 8UD.

## **20 ADDITIONAL INFORMATION**

20.1 The Potential Providers should demonstrate that they are open to working collaboratively with other suppliers, contracted by the Authority, in order to deliver related pieces of analysis.

## **21 LOCATION**

21.1 The location of the Services will be carried out at the offices of the Supplier. However, frequent meetings will need to take place with the Authority at the Supplier's offices, or at the Authority's offices in the Eastcheap Court 11 Philpot Lane, London EC3M 8UD and meeting spaces at 1 Horse Guard Road, London SW1A 2HQ.