Work Package Scope
Updating agglomeration elasticities
DfT Reference: 04/102/08

1. Introduction

The Department for Transport (the Department), in conjunction with Transport for the North and Transport for London, are keen to do further work to understand the links between infrastructure investment and economic performance and in particular to refresh and extend the existing evidence base. The work is intended ultimately to inform the development of national appraisal guidance but prior to this a range of outputs will be required to meet specific business needs in 2016.

2. Background

There is growing interest among decision makers at local / regional and national levels of Government in the economic performance impacts of transport investment. This stems from:

- an increasing requirement to demonstrate the economic growth credentials of schemes in strategic and economic case making;
- increasingly explicit linkages between the growth generated by transport investment and the means of funding it, at both the national and local levels such as via City Deals.

As a result transport business cases increasingly need to provide estimates of Gross Value Added (GVA) impacts alongside traditional welfare based appraisal metrics and DfT will expect these to be integrated, i.e. the methods of estimating them should be consistent with estimates of the productivity related welfare benefits. New WebTAG guidance requires scheme promoters to reconcile differences in the overall results as far as possible.

The Department is currently consulting on this new appraisal guidance[1]. This new guidance responds to the emerging set of requirements by building on advice set out in TIEP[2] including the need for:

- more context specific appraisal;
- improved methods of appraising land use change;
- improved links between the strategic and economic cases.

[redacted]

2 "Transport Investment and Economic Performance," [redacted]. November 2014 (DfT commissioned report).

The guidance recommends that where relevant and appropriate, innovative supplementary economic modelling is presented alongside welfare estimates derived from more traditional transport models to both help show how scheme objectives are met (strategic case) and inform the value for money assessment (economic case). There will be a need to ensure consistency in inputs and assumptions and reconcile the differences between these approaches as far as possible.

WebTAG guidance[3] sets out a welfare based approach that has been developed incrementally over many years and benefits from a large base of evidence that has been built up and refined over this time. As the TIEP report describes, it is important to understand the distinction between welfare and GDP (or GVA). By failing to capture spatial reorganisation effects it may miss some of the benefits that accrue to the national economy in aggregate, as well as failing to provide the local detail that is of interest to many stakeholders.

To provide the firm analytical and evidential base that is necessary for this requires research and development in a number of areas, including the potential research areas covered by this brief. Progress towards an improved foundation of evidence could be critical for making the case for large investment project such as Northern Powerhouse Rail[4] and Crossrail 2[5], and the client group shares a strong interest in pursuing it.

In this project the Department wishes to further examine how the relationship between agglomeration/productivity impacts and economic density varies. Firstly to improve the narrative behind this, and secondly to look at re-estimating/extending the existing elasticities.

3. Requirements

3.1. Objectives

This project should result in a clearer and comprehensive narrative surrounding agglomeration impacts. The project should also look to re-estimate and potentially extend the existing elasticities.

3.2. Work Required

We expect the first Phase of the work to develop the narrative and the potential magnitude of the elasticities. This should build on previous work done to date. For example, the relationship between connectivity / access to economic mass and productivity that was carried out by the LSE Spatial Economics Research Centre

[redacted]

(SERC) for The Northern Way[6] in 2009. This was referenced in the Department commissioned 'Transport Investment and Economic Performance' (TIEP) report.

Looking at what is currently in WebTAG could also be used as the starting point and the bidder could look to add incrementally to that. The methodology to apply the elasticities and how they were originally estimated do not match, so this is something we would like to rectify. Bidders are invited to say where they think incremental improvements would be feasible in and where new research may require a more fundamental review or extension of the existing methodology.

The focus of this work is on estimating the elasticities. We have also set out some possible areas that could be considered below. This should not be seen as an exhaustive list and we would expect the bidder to set out the areas that they expect would be covered in the work.

Some potential areas which could be investigated: as a function of city size, by mode, economic and socio-economic structure; within individual cities compared to poly-centric urban regions; as a function of the definition of economic density and transport accessibility; having separate urbanisation and localisation elasticities to account for specialisation; and as a function of economic linkages with other regions.

Questions that could be considered in the research

- *Access to Economic Mass*

The bidder could consider the existing elasticities and any methodological issues that there might be with them. SERC-type analysis and the WebTAG Wider Impacts methodology can produce differing results for the same project. One explanation for the difference is in the way connectivity is actually specified, rather than in the elasticities themselves. The SERC work is based on the assumption of a GC-1 relationship. The functional form of the 'decay curve' based on business users' actual willingness to travel is different (less steep) to this, which begs some important questions: how does the elasticity vary with choice of decay relationship? The bidder could consider what the evidence suggests is the most appropriate form of decay relationship to adopt and what are consequences of the form of this relationship for the elasticity coefficients. Furthermore, if there is sufficient evidence to pick a single form. [redacted].[7] Examples of relationships to test include travel time, generalised time and generalised cost and see how the outputs/relationships

[6] [redacted] Strengthening economic linkages between Leeds and Manchester: feasibility and implications: full report. The Northern Way, Newcastle upon Tyne.

[7] "Transport Investment and the Distance Decay of Agglomeration Benefits," [redacted]

differ. Peak period models may be most relevant for commuting, but inter-peak models might offer a better representation for business trips.

Again, important policy choices could rest on the answers to these questions – e.g. between shorter and long distance transport. In general, the steeper the curve the more important intra-zonal costs will be. Another question to consider would be to see if there is an impact on inter-city connectivity where distances are longer.

- *Separate urbanisation and localisation elasticities*

The bidder could consider if there are possibly additional effects not captured in the existing elasticities, such as impacts as a result of cities specialising and the importance of industrial clusters, which we would want to explore. One theory is that cities will continue to grow and become ever more influential in the country's economic geography.

- *Sectoral mix*

The bidder could look at whether there are differences in sectoral elasticities which we could look to understand further by breaking down the sector specific elasticities below the high levels of aggregation (e.g.: 'producer services'). The question of the extent to which there are differential responses to access to economic mass by sector is also linked to a question about the functional form/linearity used.

- *People' and 'place' effects*

WebTAG sets out elasticities but the bidder could consider if there are other data sources now available that could be considered for inclusion in guidance. For example, the access to economic mass elasticities from the SERC work did not fully reflect the complexity in the relationship between 'people' and 'place' effects and the controls for 'people' effects may have been 'overdone' as a result. This is acknowledged in the TIEP report, which describes the 2009 access to economic mass elasticities as "lower bound." While this is clearly useful, further work could be done to define the "upper bound" and the space between the two for the purposes of full analysis.

- *Mode specific elasticities*

Modes are important, particularly about getting people into areas of economic activity. For example, SERC considered access to economic mass by road (car) and rail relationships, which leaves important gaps when it comes to using the results in broader urban and transport strategies. WebTAG values are based on a weighted average across all modes. The bidder could consider if there is a case for adopting mode specific elasticities as used in the SERC analysis or if there are there merits in continuing with an approach which averages across modes because this effect is captured elsewhere.

- *Labour connectivity*

The bidder could investigate how commuting and business trips are dealt with. Work is often defined in terms of business to business connectivity – i.e. generalised costs between employment locations. This means investment in improved labour markets affects productivity via its impact on land use – i.e. by enabling higher levels of business to business through higher employment density, which may be an over-simplification.

- *Wages as a proxy for GVA.*

The use of disaggregated wage data (ASHE) in the SERC work provides a source of highly disaggregated information that can address people as well as place effects. While invaluable, in terms of using this in policy it requires a subsequent step from wages to GVA. The ONS data suggests there are, potentially cyclical, variations in the relationship between wages and GVA at the national level and what look like more structural differences between sectors and (potentially as a result) between regions.

- *Additional changes over time*

A further area the bidder could consider is where there any underlying changes in addition to those linked to the functional form and/or sector mix. Since base density and sector mix can be expected to change over time, any approach which was sensitive to sector mix/base level of connectivity can also be expected to change over time. The question is whether there is evidence of anything else going on within sector/at comparable base levels of access to economic mass.

- *Statistical challenges*

There are major statistical challenges associated with establishing a causal relationship between access to economic mass and national productivity effects. In particular there are a number of other factors that influence productivity that are also highly correlated with access to economic mass and may need to be controlled for in order to avoid under or over-estimating the impacts, such as why FDI has relocated to an area.

4. Responsibilities

The Department's Project Team is the client for this work. We will also be working closely with our key stakeholders to help steer the work via a Steering Group which will include Transport for the North and Transport for London representatives.

We expect any data requirements to be clearly set out by the bidders.

5. Skills/Experience

This is a highly specialised piece of work. We would expect there to be academic support in order to complete this work and there is an evaluation criteria to reflect the importance of this.

In order to meet the project specification the successful bidder will be required to have knowledge of the following areas:

- Evidence of having worked on regional and/or local growth issues;
- Experience in econometrics (particularly experience of evaluating transport schemes);
- A core understanding of WebTAG;
- Record of academic achievement including publication of articles or papers.

6. Deliverables

Deliverable Number	Deliverable Description	Completion Date
WP001	Phase 1 Support for Northern Powerhouse Rail and Crossrail 2 projects	November 2016
WP002	Phase 1 Interim Report	30/12/2016
WP003	Phase 2 Final Report	31/03/2017

Work Package deliverables under Phase 2 to be agreed between supplier and Project Sponsor following completion of Phase 1.

The research programme will be split into two phases.

Phase 1: Literature Review, interim outputs and work to take forwards

Literature Review and data scoping

Phase 1 is an information gathering / scoping exercise which would involve reviewing the literature to address any methodological issues and the existing elasticities. This work should build on the 2009 SERC work, Frontier Report for the National Infrastructure Commission[8] and other work already done to date. We would expect the bidder to tell the Department how they expect these things to play out in practice and the magnitude of the impact. For example what impacts do we expect specialisation to have, even if we can't estimate the size of it during this Phase.

8 [redacted]

We would expect the existing evidence to be presented and explained to the Client Group during a workshop or equivalent session that would be hosted in the Department.

There will be limits on the time and resources available for the work and there will be a need to work closely with the Department in this initial phase of work to agree the main priorities to focus on at each stage including some key early deliverables.

The bidders should indicate what data will be required in order to carry out the work and where it expects the Department to be involved in this process. One input could be the Annual Survey of Household Earnings, which is held by ONS or the Inter-Departmental Business Plan. These could be one way to control for people effects as personal level data would allow analysis of individual wage and other data.

Interim outputs

In particular the bidders will be required to provide expert advice and where appropriate, interim recommendations to support business case work by Transport for the Norther (TfN)[9] and Transport for London (TfL)[10] in 2016. The econometric testing will continue beyond this, and progress made in the interim work will be developed to inform further tests later in the year and in early 2017.

In the case of TfN, the advice and recommendations will be used to inform the development of the Strategic Case for Northern Powerhouse Rail (HS3) and other major investment schemes. This should give a direction of travel for the work such that interim results from the research can be tested at a later date.

In the case of TfL, the advice and recommendations in relation to measures of access to economic mass and elasticity values will be to inform LUTI model development. Advice will be required to inform a sensible range of 'scenarios' in relation to access to economic mass measures and elasticities for this. A final round of tests (using a fully updated Reference Case and a fully enhanced model) will take place in late 2016. Interim results from the research including econometric outputs informing specification of appropriate elasticities will be required.

The bidder will discuss this with the Steering Group to understand the interim requirements.

Work to take forward in Phase 2

We would expect the appointed researcher to provide recommendations detailing how the elasticity work should be prioritised and taken forward into Phase 2.

Phase 2: Programme of econometric testing

9 Northern Transport Strategy
10 Strategic Outline Business Case for Crossrail 2

This Phase is about estimating the elasticities and setting out a proposed methodology for how the elasticities should be applied in practice. The bidder should set out how it plans to quality assure the work.

There will be a breakpoint in the contract here and it will be at the Department's sole discretion about whether to proceed to Phase 2 or not. The decision on whether or not to proceed with Phase 2 should not be interpreted as whether Phase 1 has been satisfactorily completed but whether the results from Phase 1 indicate that it would be in the Department's best interests, and offer value for money, to continue with Phase 2. This will be primarily based on the likelihood of the tested approach(es) delivering the required up-to-date, robust and reliable values to the required timescales.

It is recognised that the scale of the research programme is such that work will have to be carefully staged in order to meet a series of interim as well as final requirements. The Department may wish to proceed with only some elements of the project to Phase 2 and this will be decided during discussions with the Steering Group. The development of different techniques for collecting data and deriving the values might proceed to different timescales. Therefore the plans and pricing schedules should:

- set out the appropriate end point for Phase 1 at the end of the data collection testing and piloting stage; and
- provide a sufficiently detailed breakdown of costs, both by workstreams / development of different techniques and by Phase 1 / Phase 2, for the costs associated with continuing with only some elements to be identifiable.

7. Additional information

None

8. Location

Performance and progress should be monitored through regular communication between the Provider and the Department's Project Managers. The format and frequency of these communications should be included in proposals, and it is expected that frequent progress reports / meetings in the Department's offices in London / teleconferences will be required to ensure the project stays on track to deliver.

9. Timescales

Start date: October 2016

Duration: 6 (months)

Phase 1 would result in an interim report at the end of December 2016, with Phase 2 completing by the end of March 2017.

10. Evaluation Criteria

Work Package Evaluation criteria –

Primary Criteria	Sub-criteria	Score	Weighting	Weighted Score
`Resources and capabilities	Supplier's prior performance on this type of work.		1	
	Suitability of key personnel, including academic record		3	
	Capability and expertise of additional staff/resource.		1	
	Appropriate allocation of resource.		1	
Technical solution proposed and competence	Demonstrates understanding of the objectives, deliverables and what the Department is trying to achieve.		2	
	Robustness of the proposal and methodology (how requirements will be achieved).		3	
	Proposed project management and quality control systems		1	
Suitability of proposed processes	Identification and management of risks		1	
Subtotal				
Total	Total Mark (Subtotal)			

The assessment panel will use the marking system as shown below, to award marks for approach or evidence, as relevant to the sub-criteria in the previous table.

Score	**Reason**	**Mark**
Weak	The proposed approach fails to demonstrate an adequate understanding of the project objectives and fails to address adequately the risk management issues. There is little evidence that the proposed approach has been influenced by experience on other projects.	1-4
Acceptable	The proposed approach demonstrates an adequate understanding of the project objectives; it addresses the success factors and risk management issues to an acceptable standard. There is an adequate level of evidence that the proposed approach has been developed as a result of successful experience on other projects.	5-7
Good	The proposed approach demonstrates a good understanding of the project objectives; it	

	addresses fully the success factors and risk management issues and provides for delivering continuous improvement over the life of the framework. There is substantial evidence that the proposed approach has been developed from other projects using formal continual improvement processes.	8-9
Excellent	The proposed approach has been tailored specifically to deliver the project objectives, and deals comprehensively with the risks to maximising performance against Key Performance Indicators and to delivering continuous improvement. There is substantial evidence that the approach has been developed using continual improvement processes, which are routinely used to develop approaches and deliver the objectives successfully on all projects.	10

The proposal with the highest mark will be given a score of 100. The score of other competing suppliers will be calculated by deducting from 100 one point for each full percentage point by which their mark is below the highest mark. The minimum requirement for this Work Package is to reach a threshold of 60. A submission that has failed to achieve the minimum quality requirements may not be considered further in the assessment.

The lowest priced tender will be given a score of 100. The score of other competing suppliers will be calculated by deducting from 100 one point for each full percentage point by which their price is above the lowest price. The overall quality score and the finance score will be combined in the ratio 70:30 applied to the quality and financial scores respectively.

Following receipt of your evaluation reports the rejection/acceptance letter will be sent out by the Framework team. Before the contract can be officially awarded, a 10 day “standstill” period needs to elapse.

11. Contact Information

Role	Location	Phone
Project Sponsor: [redacted]	Great Minster House, London	
Project Manager: [redacted]	Great Minster House, London	[redacted]
Lot 1 Framework Manager: [redacted]	Temple Quay, Bristol	[redacted]
Procurement Officer: [redacted]	The Cube, Birmingham	[redacted]
DfT Lead Business Partner: [redacted]	Group Commercial Services. Great Minster House, London	[redacted]