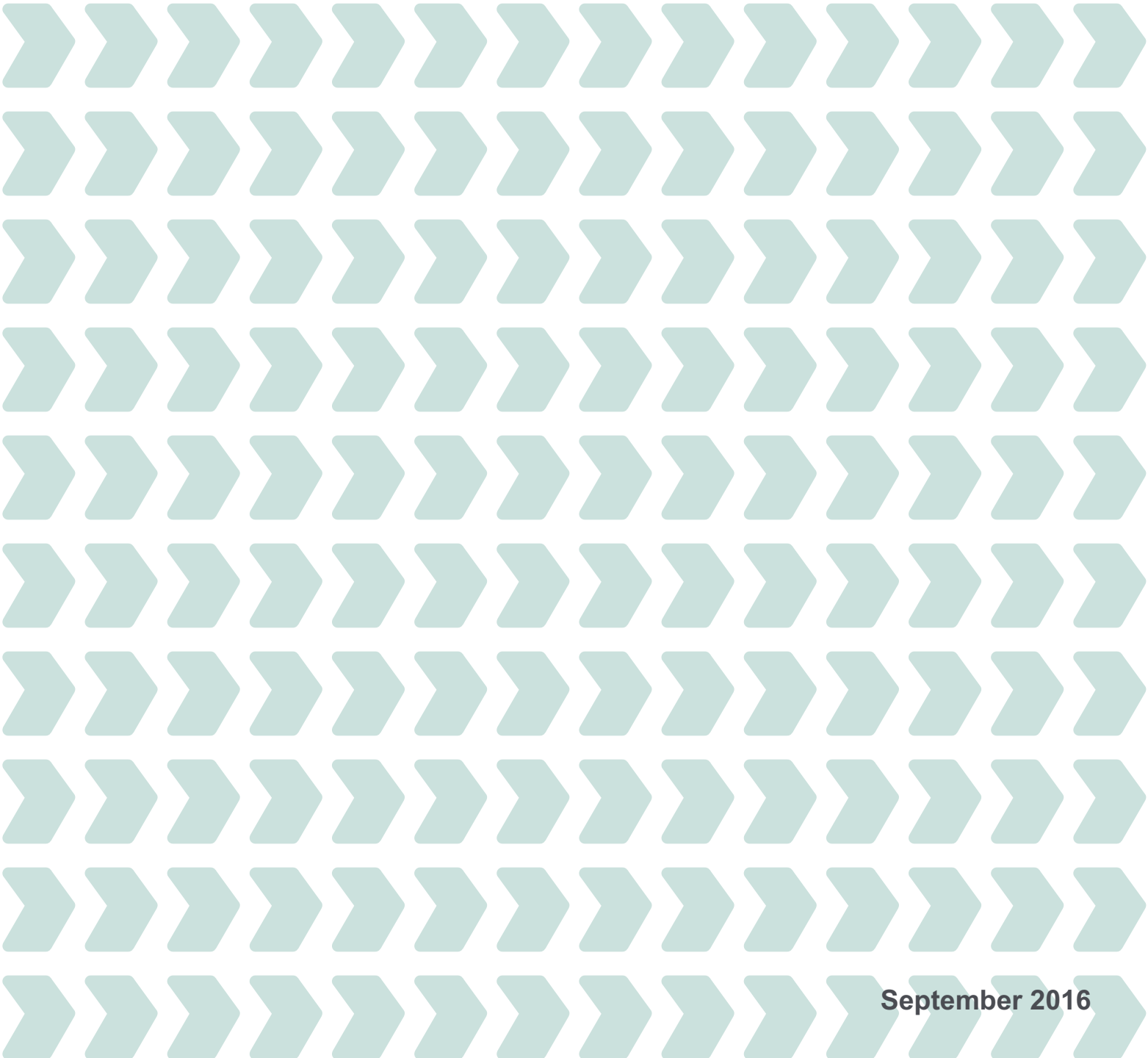
Department for Transport

Understanding and Valuing Impacts of Transport Investment

Updating Wider Economic Impacts Guidance

Moving Britain Ahead



September 2016

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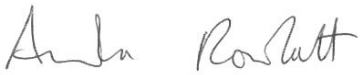
Foreword

In December 2014 we committed to update the wider economic impacts guidance in response to the recommendations in the Transport Investment and Economic Performance report and publish this for consultation.

We have now completed our guidance update and I am delighted to present this report which sets out the key changes and our reasons for these, together with our plans to strengthen further the evidence base.

Over the last year and a half, we have been advised by an expert academic panel and engaged closely with stakeholders to understand their requirements and reflect these in the updated guidance. We plan to continue working closely with experts and stakeholders and this progress report highlights several areas where we are specifically seeking input on the guidance changes and priorities for further research. We look forward to continuing to work collaboratively, to ensure the methods and analysis used to inform transport investment decisions remains relevant and robust.



Amanda Rowlatt, Chief Analyst and Strategy Director

September 2016

Executive summary

Introduction

1 The Department's evidence base for understanding and valuing the impacts of transport investments is set out in WebTAG[1]. This evidence base has been developed over many years and, when compared with appraisal practise internationally, has been noted as best practice. In October 2013 we launched the 'Understanding and Valuing the Impacts of Transport Investment' (UVITI) Analytical Strategy which set out our approach to maintaining and enhancing this evidence base through open, transparent and collaborative working with academics, stakeholders and other experts. This document is the latest in the series of publications that describe the progress we have made on delivering this strategy.

2 Wider economic impacts is the term given for the additional benefits (or disbenefits) that can arise as the impact of transport improvements is transmitted into the wider economy, beyond those business' and passengers that are directly affected by the transport change. They arise due to distortions or market failures, which mean the economy is not functioning efficiently, such that direct benefits do not capture all of the welfare associated with a transport investment.

3 Research has shown that these wider economic impacts can be significant and can arise in a number of ways. These include productivity gains resulting from improvements in how well businesses are connected to each other as well as potential employees, and benefits arising from structural changes as businesses and households relocate

4 In 2014 we made a commitment to update the wider economic impacts guidance in response to the recommendations in the Transport Investment and Economic Performance Report (TIEP). We have now completed that update, which represents a major development to the framework for the assessment of these impacts. The updated framework is built on the principles of context specific appraisal and the transparent reporting of impacts. In addition, there is a greater emphasis on valuing structural economic impacts including additionality and displacement of economic activity and new guidance on the use of economic models in appraisals.

5 This document sets out the key changes to guidance and our reasons for these, along with options for future research in this area. We are now seeking input and feedback from our stakeholders on this new guidance and on the next phase of research into economic impacts of transport investment.

Aims of the Guidance Update

6 In line with overall objective of the Transport Analysis Guidance, we have

[1] https://www.gov.uk/guidance/transport-analysis-guidance-webtag

sought to produce updated guidance which:

- is robust and based on the best available evidence;
- responds to the recommendations of the Transport Investment and Economic Performance report;
- improves the clarity of methodologies and explanations; and
- is practical and proportionate.

Improvements to Guidance

7 In response to the recommendations of the TIEP report we are proposing a major update and restructuring of the guidance to improve the analysis and communication of wider economic impacts and ensure that the full range of material impacts are captured. The main changes are:

- A new requirement for scheme promoters to produce a **context specific economic narrative** that sets out the transmissions mechanisms through which transport investment will impact the economy and achieve the stated economic objectives. This defines the context specific approach and aims to ensure proportionality, it also reduces the risk of double counting and strengthens the links across the transport business case.
- **Greater clarity on the relationship between the measures of benefits** used in appraisal (welfare) and economic metrics such as GDP or GVA and employment. The guidance describes how these should be reported in the Transport Business Case and introduces new requirements to ensure that these measures can be reconciled to a consistent evidence base.
- A stronger focus on **additionality and displacement** in the analysis and reporting of economic impacts. This provides greater clarity about the extent to which impacts are additional at the national level, or redistributed (the approach for each mechanism is set out in the new units).
- Greater flexibility to use new **modelling and valuation approaches** to supplement standard appraisal methods. This may include methods and tools that are not explicitly defined in WebTAG that may better explain context specific evidence or dynamic economic impacts and land-use change. The new guidance sets out new standards about how these models should be applied and reported.
- **Regeneration impacts have been integrated into the assessment of wider economic impacts**. This reflects a greater focus on understanding the distribution of economic activity within the guidance on wider economic impacts.

Greater clarity about how the analysis of wider economic impacts will be used to inform **assessments of value for money** by understanding the appropriate "**level of analysis**". The level of analysis is informed by the degree to which the scheme will produce structural economic impacts and change land-use. The quality and uncertainty of the appraisal approach will be used to weight the analysis in determining Value for Money.

Implementing Improvements to Guidance

8 The changes are captured in five new WebTAG units (See Appendix A for

details) which have been organised around the primary mechanisms through which transport influences the economy:

- A2.1 an 'Wider Impacts Overview Unit' which sets out the framework;
- A2.2 Induced Investment;
- A2.3 Employment Effects;
- A2.4 Productivity from Agglomeration Economies; and
- M5.3 Supplementary Economic Modelling which describes different modelling approaches where there may be significant land use change along with the principles that inform consideration of this evidence within the economic case.

9 We anticipate that for the vast majority of projects, the new guidance will not lead to a material change in the methods used in appraisal as the existing guidance covers the main economic impacts relevant to most transport investments. For these schemes the primary impact of the new guidance will be to ensure that these economic impacts are better communicated, are consistently assessed within a business case, and that applications of the guidance are informed by a better understanding of local economies.

10 For those schemes which are likely to have wide ranging impacts on the level and distribution of economic activity - typically the largest schemes and/or those leading to significant changes in accessibility - the new guidance provides a framework for extending the analysis to capture and evaluate these impacts more fully. Recognising that the methods for capturing these impacts are at the cutting edge of modelling and cost-benefit analysis as well as being context specific, the guidance provides greater clarity about the standards which will inform our assessment of the robustness of these methods.

Future research programme

11 This project represents a major milestone in our analytical strategy. We are releasing this guidance for consultation to seek views on the proposed update.

12 In addition to the guidance, we have also identified a number of potential areas for future research. Informed by the responses received, we will work to finalise guidance for inclusion within WebTAG and prioritise areas for future research.

Seeking your views

13 Collaborative, open and transparent working with our stakeholders is an important element of our analytical strategy. Therefore we are seeking your feedback, particularly in those areas highlighted in the document. You can get in touch by emailing TASM@dft.gsi.gov.uk, with the subject 'Wider Economic Impacts Guidance Update' by Thursday 22nd December 2016.

1. Understanding and Valuing the Impacts of Transport Investment

1.1 The Understanding and Valuing the Impacts of Transport Investment (UVITI) analytical strategy has been designed to ensure that our evidence base, set out in WebTAG, remains world class and continues to provide high quality, robust evidence to inform Business Cases for transport investment. It also aims to build confidence in our evidence base through an open and transparent approach, working closely with experts and stakeholders.

1.2 The strategy sets out five key analytical development themes that aim to meet the needs of our stakeholders. Detailed work programmes have been developed for each of the themes. The overall progress on the programme, including the latest research and next steps for development, was set out in December 2014 and was shaped further at the UVITI engagement event in March 2015 and subsequent engagement events. This document focuses on the theme of Economic Growth, with progress on the overall programme reporting in Autumn 2016.

1.3 Within the Economic Growth theme, a commitment was made to respond to the recommendations of the "Transport Investment and Economic Performance Report" report by Professor Tony Venables, Professor Henry Overman and Dr James Laird.[2]

1.4 Over the past 18 months, the Department has worked closely with expert advisors and those designing schemes with economic growth objectives, and has developed new WebTAG wider economic impacts guidance based on the latest modelling and valuation methods. We are now seeking wider feedback on our proposals. This document sets out our rationale for the changes and the process for how you can respond to our consultation.

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/386126/TIEP_Report.pdf

2. Context for Updating Wider Economic Impacts Guidance

2.1 A well-functioning transport system is critical for the economic prosperity of our country. Every day over 135 million journeys are made using our roads, railways and airports. The mobility we enjoy helps people secure jobs, gives access to a wide variety of leisure activities and services, and allows business to trade with each other and the rest of the world.

Investment in the transport system has a number of direct and indirect impacts on the economy

2.2 Investing in our transport networks provides opportunities to improve the economic prospects of communities and businesses across the country and frequently forms a critical part of economic development and regeneration strategies. However, the benefits associated with our transport networks are ultimately derived from the activities which they allow people and businesses to engage in. It follows that investment in transport needs to well targeted – the most successful transport schemes are typically those which best help people and businesses carry out their day to day business.

2.3 To ensure that investment is properly targeted the Department has built up - over a number of decades - an evidence based approach to assessing the impacts of schemes. The design, construction and operation of transport networks have far reaching impacts on the economy, environment, health and society. It is critical if we are to secure the best returns from our investment in transport that we account for all of these impacts. This report focuses on how we overcome the challenges of quantifying and valuing the impact of transport investment on the economy.

2.4 The standard approach for valuing the benefits of transport investment on the economy has been to focus on the direct impact of improvements in the transport network (e.g. time savings). Whilst appearing to be a simplistic method of valuing benefits, this approach has been demonstrated to reflect a

wide variety of impacts which are subsequently experienced in the real economy.

Example: Transfer of transport direct benefits

The direct benefits of transport investment can be transferred to people who are not themselves users of the project. For example, following the completion of a transport project a commuter alters their journey to work to take advantage of a newly available route. The new route offers a quicker and cheaper travel option. These benefits are described as 'user benefits'.

This person may then decide to 'trade the journey time improvements' for improved housing, e.g. gaining a bigger garden, but further away from their job (because of the infrastructure improvement they have not increased their travel time). This new area may become more attractive, increasing land value through an increase in rent and house prices. This benefit may *transfer* to the original house owner when housing is purchased or a property is rented.

The benefit to the original house owner should not be counted if the user benefits received by the commuter already have been - the user benefit has been transferred. To include it would be double-counting the benefit.

2.5 In 1999 the Standing Advisory Committee on Trunk Road Assessment (SACTRA) published their report on 'Transport and the Economy'[3]. Whilst the SACTRA report confirmed the validity of the standard approach to estimating economic impacts it found that under certain conditions (where markets were not behaving perfectly), it did not provide a comprehensive estimate of the full impact of a scheme. This report provided the foundations of the Departments current understanding of economic impacts.

2.6 Following the SACTRA report the Department published (in 2005) 'Transport, Wider Economic Benefits, and Impacts on GDP[4]. This led to the development of guidance for capturing the impact of transport improvements on agglomeration, labour supply and imperfect competition. These impacts are now routinely estimated for larger transport schemes. In 2009 further guidance was published for assessing the benefits of new housing developments which are dependent on investment in transport.

2.7 Recent years have seen an increased interest in the impact of transport on economic prosperity. This has led the Department and the wider industry to re-consider whether our methods and reporting practices remain robust. This interest has been driven by:

- A growing number of transport schemes whose impact on accessibility is likely to radically affect the case for investing in different areas;
- An increasing propensity for transport schemes to be promoted with the explicit aim of changing the distribution of economic activity and land-use (e.g. new commercial developments); and

[3] SACTRA (1999); "Transport and the economy: full report".
http://webarchive.nationalarchives.gov.uk/20090325061432/http://www.dft.gov.uk/pgr/economics/sactra/

[4] DfT (2005); "Transport, wider economic benefits and impacts on GDP"
http://webarchive.nationalarchives.gov.uk/+/http:/www.dft.gov.uk/pgr/economics/rdg/webia/webmethodology/sportwidereconomicbenefi3137.pdf

- A stronger focus on understanding how transport schemes will help achieve economic objectives at a local, regional and national level.

2.8 One of the primary concerns has been the extent to which our appraisal framework fully captures the structural economic impacts which cover benefits arising from changes in the geographical distribution of economic activity including where people live and work (land-use). For technical reasons, the benefits of transport schemes in the standard approach are estimated on the basis that land-use is fixed i.e. does not change significantly as a result of the investment.

2.9 Whist it had previously been demonstrated that the assumption of fixed land-use was unlikely to have any material impact on the estimate of benefits for most schemes, there was a concern that some schemes in the Department's investment portfolio were pushing at the limits of the standard approach. As a result the Department commenced a programme of work to further develop how it assessed economic impacts.

2.10 In Spring 2014 the Department commissioned Professor Tony Venables, Professor Henry Overman and Dr James Laird to provide recommendations for improving current methods to quantify, value and report Wider Economic Impacts. This culminated in the Transport Investment and Economic Performance (TIEP) report[5], which was published later that year. The report commented that the Department's "appraisal guidelines provide a rigorous framework for appraising projects" and "[the Department] has been a world-leader in incorporating some of the wider impacts of transport improvements." Nevertheless it also set out a number of recommendations for improving guidance:

- Appraisal techniques are, in some cases, insufficiently context and project specific; they need to be informed by a clear narrative about likely economic impacts of the project.
- There should be a closer connection between the strategic and the economic cases for transport investment.
- Appraisal of larger projects should direct more attention to impacts on private sector investment decisions and associated changes in employment and economic activity.
- Land-use change (and more general changes in the level and spatial distribution of private investment) should be estimated and reported in a wider range of projects.
- In some circumstances it will be appropriate to produce estimates for a range of different scenarios concerning private sector responses and related government policies.
- The Department should set best practice techniques and promote informed debate by encouraging transparency in appraisals done by others.
- Component parts of the Department's appraisals could be better integrated.

2.11 Whilst providing a clear direction for development of our appraisal framework, the TIEP report highlighted a number of challenges which needed to be overcome to implement a more comprehensive approach. In particular,

[5] Venables, A., Overman, H., Laird, J. (2014); “Transport Investment and Economic Performance: Implications for project appraisal” https://www.gov.uk/government/collections/transport-appraisal-and-strategic-modelling-tasm-research-reports

methods of forecasting changes in economic geography (e.g. land-use transport interaction models) remain in their infancy and continue to be developed at a rapid pace.

2.12 The Departments response to TIEP, published in December 2014[6], set out a programme of work to develop our wider economic impacts guidance. This programme has reached a key milestone with a major update and restructuring of WebTAG Wider Economic Impacts Guidance Units. These changes are set out in Section 3 and the peer review of the changes are discussed in section 4. In recognition that many of the methods for forecasting and valuation of changes in economic geography remain at an early stage of development part of the new guidance provides a framework for identifying robust evidence that can be used to inform appraisal. This has been developed in conjunction with the Department's proposed future research programme (section 5) with a view to supporting the development of robust economic modelling methods.

6 Understanding and Valuing the Impact of Transport Investment, Progress Report December 2014, https://www.gov.uk/government/publications/transport-appraisal-in-investment-decisions-understanding-and-valuing-the-impacts-of-transport-investment

3. Key Changes to Wider Economic Impacts Guidance

Developing new guidance

3.1 Developing guidance in response to TIEP involved close working with experts, and reflecting upon insights we have gained from investigating the impacts for a number of schemes.

3.2 A key insight has been the challenge around effectively communicating economic impacts in the transport business case, both in terms of the metrics (GDP/GVA/Welfare) and in appraisal guidance that supports a common understanding of what impact the scheme will have on the economy, and ultimately whether it will achieve the stated objectives.

3.3 Our response has been to promote a common language around the transmission mechanisms through which transport investment can impact the economy, and are consistent with those set out in the TIEP report. Then clearly linking the methods to quantify and value economic impacts to these mechanisms.

3.4 In addition, the new guidance provides methods to calculate both the GVA/GDP and Welfare Metrics to increase transparency and ensure informed discussions about economic impacts.

3.5 This section begins with a summary description of the mechanisms through which transport can impact on the economy before setting out the proposed changes to guidance.

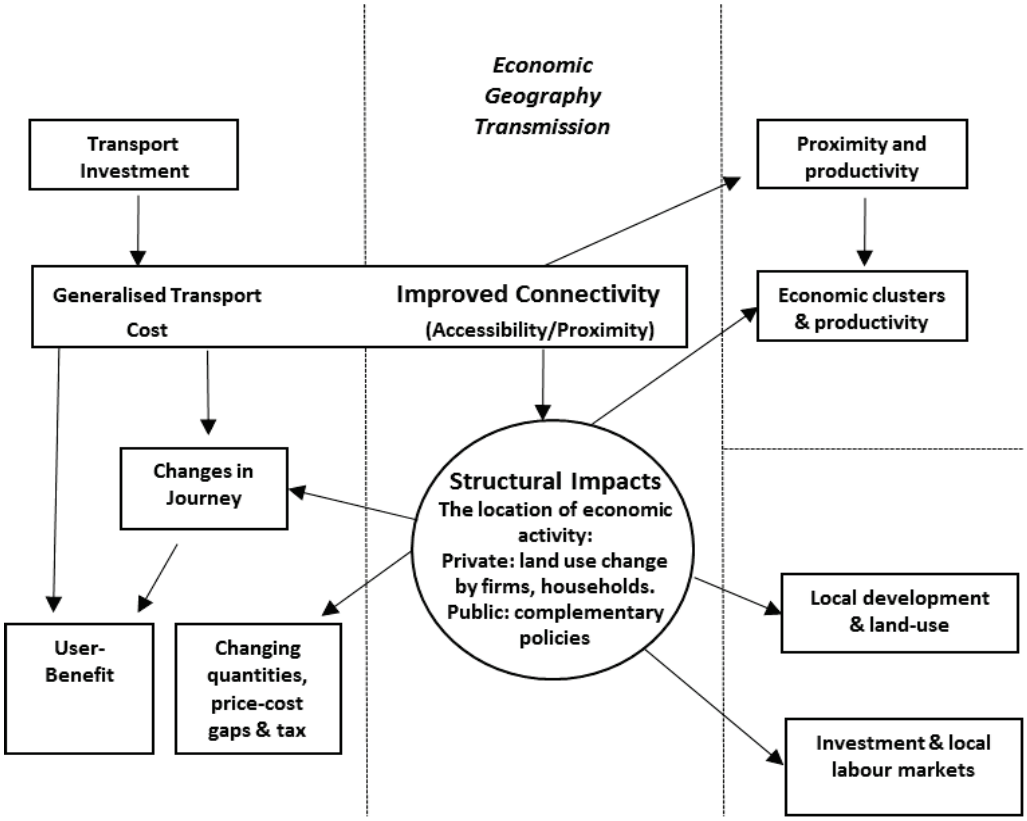


Figure 1: The effects of transport investment and transmission mechanisms

Transmission Mechanisms

Change in transport costs

3.6 Well targeted transport investments improve accessibility; in other words transport investment makes travel between different locations easier. Improvements in accessibility are measured by changes in travel costs and act to raise productivity, as activities can be completed with fewer resources. Where these changes in costs accrue to businesses this will directly impact economic performance.

3.7 Changes in travel costs are transmitted to secondary (non-transport) markets, as households and businesses change their behaviour in response to the new opportunities. The behavioural responses, such as induced investment and employment effects, can lead to changes in the level and location of economic activity. These are discussed in more detail below.

Agglomeration

3.8 There is a strong body of evidence showing that areas of high economic density tend to have higher levels of productivity. This effect is known as agglomeration. Transport can affect agglomeration in two ways:

- By reducing the inconvenience of travel (e.g. time taken, costs), investment in transport can bring firms and employees effectively closer together. This is described as static clustering as the productivity gain doesn't require firms or households to relocate.

- By increasing the accessibility of an area, investment in transport can lead to businesses and/or households relocating, directly affecting the economic density of an area. This is described as dynamic clustering and is dependent on firms and/or households relocating in response to a transport investment.

3.9 Agglomeration impacts may occur within or across industries, termed localisation and urbanisation economies, respectively.

Employment Effects

3.10 Investment in transport can encourage people to enter the employment market by reducing the costs of commuting and making more distant (and perhaps higher paying) jobs accessible.

3.11 Furthermore, changes in accessibility can change the demand for labour particularly at a local level. As discussed below, the extent to which this is additional will depend on whether this increase in demand arises as a result of economic activity being displaced from elsewhere in the country. However, even if the total level of employment remains unchanged, any redistribution of jobs could affect agglomeration (see above) or contribute to regeneration.

Induced Investment

3.12 The change in accessibility brought about by investment in transport may change the attractiveness of a location and affect households' and firms' location decisions. It may also affect businesses decisions about intensity of production, affecting output. In special cases, investment in transport may lead to the removal of constraints (e.g. planning or capacity) which allow new housing or commercial development to take place.

3.13 The degree to which induced investment is beneficial at the national level will depend on the extent to which investment is displaced from elsewhere within the country.

Enhancing our appraisal approach

3.14 In response to the recommendations of the TIEP report we are proposing a major update and restructuring of the guidance to improve the analysis and communication of wider economic impacts and ensure that the full range of impacts are captured. The main changes are:

- A new requirement for scheme promoters to produce a **context specific economic narrative** that sets out the transmission mechanisms through which transport investment will impact the economy and achieve the stated economic objectives. This defines the context specific approach and aims to ensure proportionality, reduces the risk of double counting and strengthens the links across the transport business case.
- **Greater clarity on the relationship between the measures of benefit** used in appraisal (welfare) and economic metrics such as GVA or GDP and employment. The guidance describes how these should be reported in the Transport Business Case and introduces new requirements to ensure that these measures can be reconciled to a consistent evidence base.
- A stronger focus on **additionality and displacement** in the analysis and reporting of economic impacts. This provides greater clarity about the extent to

which impacts are additional at the national level, or redistributed (the approach for each mechanism is set out in the new units).

- Greater flexibility to use new **modelling and valuation approaches** to supplement standard appraisal methods. This may include methods and tools that are not explicitly defined in WebTAG that may better explain context specific evidence or dynamic economic impacts and land-use change. The new guidance sets out new standards about how these models should be applied and reported.
- **Regeneration impacts have been integrated into the assessment of wider economic impacts**. This reflects a greater focus on understanding the distribution of economic activity within the guidance on wider economic impacts.
- Greater clarity about how the analysis of wider economic impacts will be used to inform **value for money assessments** by understanding the appropriate "**level of analysis**". The level of analysis is informed by the degree to which the scheme will produce dynamic economic impacts and change land-use. The quality and uncertainty of the appraisal approach will be used to weight the analysis in a Value for Money assessment.

3.15 These changes are captured in five new WebTAG units (See Appendix A for details) which have been organised around the primary mechanisms through which transport influences the economy:

- The Wider Impacts Overview Unit (A2.1) which sets out the framework
- A2.2 Induced Investment;
- A2.3 Employment Effects;
- A2.4 Productivity from Agglomeration Economies; and
- M5.3 Supplementary Economic Modelling which describes different modelling approaches where there may be significant land use change along with the principles that inform the weight that this analysis should have in the economic case.

3.16 We anticipate that for the vast majority of projects, the new guidance will not lead to a material change in the methods used in appraisal as the existing guidance covers the main economic impacts relevant to most transport investments. For these schemes the primary impact of the new guidance will be to ensure that these economic impacts are better communicated across the transport business case and that applications of the guidance are informed by a good understanding of local economies.

3.17 For those schemes which are likely to have wide ranging impacts on the level and distribution of economic activity - typically the largest schemes and/or those leading to significant changes in accessibility - the new guidance provides a framework for extending the analysis to capture and evaluate these impacts more fully. Recognising that the methods for capturing these impacts are at the cutting edge of modelling and cost-benefit analysis as well as being context specific, the guidance provides greater clarity about the standards which will inform our assessment of the robustness of these methods.

Making Appraisal Context Specific

3.18 To encourage greater awareness of the context in which transport investment occurs and the benefits of a more tailored approach to appraisal, the proposed guidance will require all scheme appraisals which support an economic objective to be informed by an 'economic narrative'. The narrative will set out the expected economic impacts of a transport project and the justification based on economic theory and context specific evidence. On the basis of the expected impacts and the associated transmission mechanisms, the guidance can then be used to identify appropriate methods to quantify and value these (see TAG Unit A2.1 Wider Impacts Overview Unit).

3.19 The purpose of the economic narrative is to:

- Ensure the approach is proportionate
- To reduce the risk of double counting economic impacts
- Ensure the approach is context specific and relevant to the schemes
- Improve the consistency across the transport business case
- Understand the importance of complementary investments
- Strengthen the links between appraisal and evaluation

Proportionate approach

3.20 For some schemes we believe a standard appraisal will sufficiently capture the range of economic impacts. Where consideration of wider economy impacts described in the proposed guidance may be relevant, defining a robust economic narrative at the beginning of the appraisal process, and designing the analysis around this, will support the practitioner to determine whether the extra effort incurred to capture wider economic benefits is justified.

Reducing the risk of double counting

3.21 The methods described for quantifying and valuing wider economic impacts are, in principle, additive. If all the available methods were summed without assurance, however, there would be a risk of double counting. In response we have strengthened the definitions of our valuation methods and linked these to the relevant transmission mechanisms. This reduces the potential to double count because only methods that are relevant to the narrative should be included.

Context Specific Evidence

3.22 The economic narrative can, where appropriate and justified, identify alternative methods to capture wider impacts that may reflect the local context. For example, guidance includes methods for valuing productivity impacts that individuals and businesses derive from locating in close proximity to each other (agglomeration impacts TAG Unit A2.4). These are based on National level data and the relationship is fixed for anywhere in the country (Graham et al (2009)).[7] There is some evidence to suggest that this fixed relationship does not fully reflect productivity impacts in the most densely-crowded areas.[8]

[7] *Graham D. J., Gibbons S. and Martin R. (January 2009) Transport Investment and the Distance Decay of Agglomeration Benefits, Centre for transport Studies, Imperial College, mimeo http://personal.lse.ac.uk/gibbons/Papers/Agglomeration%20and%20Distance%20Decay%20Jan%202009.pdf*

[8] Graham, D. J. (2006) 'Variable returns to agglomeration and the effects of road traffic congestion'

3.23 Further, context specific evidence can be introduced into the appraisal process through the use of alternative scenarios, set around a core appraisal scenario, using the methods defined in guidance. The degree to which these alternative scenarios are included in the assessment of value for money depends on the quality of modelling and the underlying rationale set out in the economic narrative.

Improving consistency across the transport business case

3.24 Economic impacts can be relevant across many parts of the business case. To improve the consistency of reporting of wider economic impacts across the Transport Business Case the framework brings them together in an Economic Impacts Report. This will describe the economic objectives of the scheme alongside the economic narrative with the details and results of the analysis. This, combined with new guidance provides methods to calculate both the GVA or GDP and welfare metrics, supports improved consistency and transparency in reporting economic impacts.

Complementary investments

3.25 Reflecting that for many schemes with economic objectives the outcomes are not solely dependent on transport investment, but are part of a package, assessing the impacts in isolation may not fully capture the benefits of the investment. The guidance supports the presentation of alternative scenarios for varying levels of complimentary investment which can be used to inform the value for money assessment.

Linking appraisal and evaluation

3.26 The economic narrative can also serve to pass appraisal information on to the evaluator. This helps ensure consistency in appraisal and evaluation and encourages the comparability of outturns and forecasts needed as part of an evaluation. It can inform practitioners to store and collect the data needed for the evaluation. This is particularly relevant for the evaluation of wider economic outcomes, such as reducing levels of deprivation or facilitating housing growth, as this can be data and resource intensive and can also present methodological challenges such as defining the counterfactual.[9]

Calculation and reporting of economic metrics

3.27 The guidance reaffirms that the economic case should be calculated on the basis of economic welfare. This is consistent with the requirements of the Treasury's Green Book and ensures that all relevant impacts are considered when assessing the Value for Money of a scheme.

3.28 Gross Domestic Product (GDP) and Gross Value Added (GVA) along with other economic metrics such as employment are not a substitute for welfare analysis. This is because they fail to account for the costs of generating that economic activity (e.g. lost leisure time) and the wider social and environmental impacts associated with the transport investment. Furthermore, a robust appraisal of welfare benefits will already capture the benefits associated with increased economic activity.

[9] Department for Transport, Strengthening the Links between Appraisal and Evaluation. 2016.

3.29 Whilst economic indicators such as GVA and GDP and employment should not be used as a headline indicator in the economic case we recognise that they can play an important role in providing information about how well a scheme is likely to meet its objectives. The guidance clarifies the role of these metrics in the strategic case and provides the tools to reconcile them with the analysis presented in the economic case to improve transparency.

Additionality and Displacement

3.30 Transport investment can expand the size of a local economy, but identifying whether this is additional at the national level means understanding the extent to which local impacts involve the relocation (displacement) of economic activity from other areas of the country. Other than the direct impacts on transport users (such as productivity increases resulting from improved journey time and reliability) the default assumption is that wider economic activity is 100% displaced i.e. no net national economic impact. The new guidance clarifies this position, then clearly sets out when it is appropriate to move away from this default assumption, along with the types of supporting evidence that would be needed.

3.31 The new guidance is in line with HM Treasury Green Book with the responsibility on scheme promoters to provide evidence on the level of displacement and additionality. This reflects that there are not off the shelf additionality/displacement factors that apply to all schemes. DCLG sets out methods to value enabled investment such as (housing or commercial developments). The benefits are derived using the same "land value uplift approach" that is set out in A2.2 Induced Investment. Their guidance also recommends default displacement factors. However these are not applicable in a transport context because they are based on the link between economic cycles and enabled housing or commercial investment. In contrast enabled investment resulting from a transport intervention is due to developments that are planned but, because of a lack of infrastructure, are unlikely to go ahead in any event.

3.32 Whilst evidence on the role of transport investments on economic growth is strong and well established in the Department, the impact on FDI is uncertain. FDI can be defined as 'a category of cross borders investment made by a resident entity in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct investor.'[10] It is identified for the advantages which it could bring to the host country such as employment, productivity, technology and innovation.

3.33 There is a potentially positive relationship between transport investment and FDI, although there is not sufficient evidence to quantify the impact. Furthermore there is also uncertainty about how to measure the GDP and welfare impacts from any increase in FDI. As such the Department does not currently provide guidance for the analysis of such impacts.

[10] The Benchmark Definition of FDI, 4th edition, OECD, 2008

Modelling and Valuation of Economic Impacts

3.34 Understanding the impact of transport improvements on the level and spatial distribution of economic activity is challenging. The analytical techniques typically used are at the 'cutting edge' of development and subject to a significant level of uncertainty. However where a scheme is likely to have a significant impact on land use and the distribution of economic activity, understanding the change in land use will support the provision of a more comprehensive understanding of the impact of the investment.

3.35 To balance the risks of increased uncertainty and error with the opportunity to capture a more comprehensive picture of impacts the new guidance introduces varying 'levels of analysis' that reflect the confidence in the different modelling and valuation approaches. This builds up the analysis of economic impacts around a core scenario based on a standard appraisal:

- Level 1 covers direct economic impacts in the transport market assuming insignificant land use change (excluding wider economic impacts). This should be produced for all schemes.
- Level 2 builds on this to capture wider 'connectivity' economic impacts, which can be estimated without explicit land use modelling. The analysis is presented as part of the value for money assessment, in addition to the analysis in Level 1.
- Level 3 additionally includes analysis in which either land use change is explicitly quantified or supplementary economic modelling has been conducted, capturing wider 'structural' impacts.

3.36 The decision about what level of analysis to conduct for individual schemes should be informed by the economic narrative with reference to proportionality and relevance.

3.37 The Department believes that, for the majority of transport investments, the level 1 and level 2 analysis will comprehensively capture the impacts of the scheme. However, where a transport investment is likely to significantly change the level and spatial distribution of economic activity, complex feedback loops between many economic agents may mean level 2 analysis to assess the contribution from individual market failures may not adequately capture the impacts. The existing methods to fully model the interaction between land use and transport, or to model the detailed transmission of impacts through the wider economy (real economy models) are complex, at an early stage of development and are subject to a high risk of error, presenting a significant challenge for appraisal.

3.38 Over the past year we have worked closely with scheme sponsors and promoters who are actively developing these methods to understand the opportunities and risks presented. The proposed guidance aims to create an environment that supports the development of these models in three ways (see TAG Unit M5.3 Supplementary Economic Modelling):

- Provides a list of key criteria for development of a high quality model
- Supports the use of these models' outputs in the economic case, with a clear process for their use in the Transport Business Case

- Sets out minimum reporting requirements to allow transparent scrutiny and inform the weight given to model outputs within the business case

Creating a bridge between GVA and Welfare

3.39 The modelling methods (commonly referred to as "GVA modelling" or real economy modelling) that can be used to explore the changing spatial distribution of economic activity often focus on the dynamics of the economy rather than wider social welfare implications. As set out above, the weight attached to modelling evidence in the value for money assessment is dependent on an assessment of its quality. When using 'real economy modelling' this assessment will be informed by the approach taken to creating a bridge between real economy model outputs (GVA or GDP) and the welfare metric, which captures not only the economic but also the social impacts of an investment. Creating this bridge between welfare measures and GVA/GDP analysis improves transparency and supports a consistent assessment of economic impacts within the transport business case.

Regeneration impacts

3.40 The assessment of regeneration impacts are a significant part of many transport appraisals. WebTAG currently includes a specific unit covering the assessment of regeneration impacts (TAG Unit A2.2). As part of the new guidance we plan to retire the existing unit, embedding the approach to regeneration impacts in a consistent way across the new guidance, reflecting that many of the impacts termed 'regeneration' are captured through standard wider economic methods.

3.41 For some regeneration business cases, the emphasis of the scheme may be on redistribution, rather than net national economic impact. The new guidance clarifies reporting on local and national impacts ensuring that decision makers have as comprehensive a picture of the impacts as possible.

3.42 The new guidance also provides a clear framework for business case developers to use supplementary economic modelling, where proportionate, to explore the impacts of land use change and redistribution of economic activity to inform the value for money assessment.

4. Academic Review

4.1 Throughout the process to update the guidance, we have been advised by an expert panel composed of Professor Tony Venables, Professor Peter Mackie and Dr James Laird. As part of our quality assurance process the academics were asked to review the units against the following criteria: (1) the extent to which the updated units implement the TIEP recommendations; (2) the logic of the approach and its coherence across the five units; and (3) the robustness of the methodologies and evidence base. The academic reviews are reproduced in Annex B.

4.2 Overall, the panel agree the new guidance responds appropriately to the TIEP report and the structure is much improved from that of the existing guidance. They support the introduction of the economic narrative and the guidance on agglomeration, employment and output impacts. Whilst, the academics note that the Department's treatment of land use in the new guidance represents "a major step forward," they hold some reservations on the dependent development guidance, which are discussed below.

4.3 This section summarises the main observations made during the academic review and our response to these.

Context Specificity

4.4 The academics raised a number of points within the broad heading of context specificity. These ranged from the guidance being too abstract at the one extreme and (potentially) too mechanical at the other. The guidance seeks to ensure that evidence presented in the Transport Business case is both robust but also accessible and practical.

4.5 With respect to the application of methodologies a certain degree of prescriptiveness is required. However, we have sought to ensure context specificity through the use of economic narratives to justify the scope of the wider economic impacts analysis. To support the practitioner to develop the economic narrative, each unit contains an ‘Understanding the Impacts’ section and within units there is frequent cross-referencing to highlight the fact that one underlying economic change may have effects in all three units.

4.6 It is also suggested that the full range of methods is only applicable to very major schemes or programme level appraisals because in most cases the appraisal of wider economic impacts will be disproportionate and too complex to predict with confidence.

4.7 Whilst we strongly agree that wider economic impacts should only be assessed where it is proportionate and relevant to do so, the scope of the analysis will be

context specific. Further the absence of a wider economic impact assessment from a Transport Business Case will not in and of itself undermine the case for intervention. Going forward we will look to provide more detailed guidance on the circumstances in which an assessment of wider economic impacts would be relevant.

4.8 The use of context specific evidence to inform the value for money was highlighted as an area of potential concern because it may prevent comparability between different Transport Business Cases. In response we have ensured comparability by requiring a core scenario to be reported that is based on the standard values set out in Transport Analysis Guidance, with context specific evidence introduced as a sensitivity test. The relevance, and quality of the analysis will be used to determine the amount of weight given to each scenario in the value for money assessment.

4.9 The panel also stressed the need for the Department to have the appropriate expertise to effectively scrutinise the robustness of bespoke analysis. In response, one of the analytical quality assessment criteria set out in the supplementary economic modelling guidance is independent peer review. To build internal expertise within the Department, we will explore the establishment of a panel of experts who can provide independent challenge and advise the Department on the standard of bespoke economic analysis whilst the new guidance is being embedded.

Land Use Change

4.10 The panel raised a number of points with respect to the Department's approach to land use change and its monetisation in appraisal: (1) the description of limitations of the current user benefit methodology in the case of land use change; (2) the valuation of user benefits under land use change with the existing methodology in TAG Unit A1.3.

4.11 The panel felt that the reference to a ‘breakdown’ of the rule of half methodology incorrectly characterised the issue of land use change in the estimation of user benefits. Instead the issue relates to a failure to capture the full range of benefits, rather than a failure in the theory of consumer surplus. In the final draft of TAG Unit A2.1 we have addressed this point and provided a clearer description of the issues with the current user benefit methodology in the case of land use change.

4.12 With respect to the value of user benefits under land use change within the existing TAG Unit A1.3 methodology, the Department has opted against for the time being, as there is very limited evidence about the size of errors. The reference to errors being less than 20% of the true value and potentially within 0.5% to 6% is based on only two studies, the former a theoretical paper and the latter a practical study[11]. Given this extremely limited evidence the Department will continue to advocate the estimation of user benefits under assumption of insignificant land use change, whilst considering further the potential to estimate user benefits under land use change.

[11]Laird, J.J. and A.J. Venables (2016) Transport investment and economic performance: a framework for project appraisal. Paper presented at Nectar Cluster 1 (Networks: The Wider Economic & Social Impacts of Transport Networks) workshop, 19-20 May 2016, Molde, Norway

Land Value Uplift

4.13 The panel raised concerns around the use of land value uplift to estimate the benefits of land use change in the case of Dependent Development. Specifically, that land value uplift could be subject to significant errors, potentially greater than those which would arise if user benefits were calculated assuming fixed land use. This is because a range of different impacts, unrelated to the transport investment, could be affecting land prices, such that benefits are misattributed to the scheme. In addition, there is potential for double counting of other impacts already captured in the analysis.

4.14 Within the guidance we summarise clearly many of the weaknesses of the land value uplift and restrict its usage to dependent developments. Furthermore, we state that given the weaknesses scheme promoters should where possible use context specific evidence and identify the factors driving the land value uplift, rather than use simple averages and attribute it all to the transport investment. As part of the research strategy we intend to investigate the potential for evidence based displacement factors to be included in future guidance.

Employment Effects

4.15 A number of observations were made about the methodology to estimate the benefits associated with employment effects, namely the inclusion of corporation tax in the estimation of the tax wedge and the consistency of the tax rates in the guidance with prevailing tax rates.

4.16 The reason for including corporation tax in the Employment Effects unit is twofold. First, it is reasonable to assume that if either the level or geographical location of employment changes, this must be the result of both individuals and firms changing their supply of and demand for labour and that these decisions are based on net private benefits (benefits adjusted for tax and all other costs). Second, it would be disproportionate to ask scheme promoters to provide separate granular analysis for the employee and employer. However, further research and development is planned to develop our understanding on the valuation of employment effects.

Agglomeration Impacts

4.17 The agglomeration methodology is one of the most developed within the wider economic impacts' framework. However, the panel did raise a number of points for possible improvement, including developing mode specific elasticities along the lines of the SERC[12] work and including time periods in the estimation of generalised travel costs. Addressing these points is part of the broader investigation to update the agglomeration evidence base.

[12] Overman, H., Gibbons, S., D'Costa, S., Mion, G., Pelkonen, P., Resende, G. and Thomas, M. (2009) Strengthening economic linkages between Leeds and Manchester: feasibility and implications: full report. The Northern Way, Newcastle upon Tyne. http://eprints.lse.ac.uk/43146/1/Strengthening%20economic%20linkages%20between%20Leeds%20and%20Manchester_full%20report(lsero).pdf

Position of Economic Impact Report in Transport Business Case

4.18 The Economic Impacts Report is designed to bring together the analysis on economic impacts to improve transparency. The panel identified a risk that reporting may become 'excessively fragmented'. However minimum reporting requirements will require that all the technical information underpinning both the welfare and GDP estimates of economic impacts should be presented in the Economic Impacts Report, with the aim of reducing fragmentation. Whilst the quality of Economic Impacts Reports will no doubt improve as they become a settled fixture of Transport Business Cases, we consider the risk of fragmentation to be low.

Inclusion of Indirect Tax

4.19 The panel identify that the distortionary effects of indirect tax are potentially a market failure that should be included in the Wider Economic Impacts guidance. We are planning to look into indirect tax distortions as part of the updated research strategy.

Availability of Economic Narrative

4.20 We agree with the suggestion that the Economic Narrative should form part of the audit trail and should be appropriately scrutinised when forming judgements about the merits of a Business Case. The Economic Narrative is an integral part of a Transport Business Case and the presumption should be that this is made available whenever a Business Case is published.

Complementary Investments

4.21 The panel raised concerns around the representation of the costs and benefits associated with complementary investments. In particular the academics note the approach proposed in the guidance could lead to the total absolute benefits of a complementary investment being misrepresented as benefits net of costs.

4.22 The Department’s position is to create a BCR in which benefits are compared to the costs to the broad transport budget. This necessitates that non-transport costs are included as dis-benefits within the BCR. The formulation of the BCR is out of scope of this research project and the units have been drafted to reflect current practice.

5. Areas for Further Research

5.1 Since the publication of TIEP and our response, we have engaged closely with scheme promoters and sponsors, wider stakeholders, the academic experts advising this project[13] and the Department's Joint Analysis Development Panel[14] to identify areas where guidance could be refined and the evidence base strengthened, summarised below. As part of this consultation we are seeking suggestions on the priorities for future research.

Productivity from Agglomeration Impacts

5.2 The current guidance on agglomeration impacts captures the productivity impacts of urban clusters through the use of UK wide average effects, which may not reflect the characteristics of the local area. There are a number of ways in which the evidence base could be developed. For example, the guidance could be developed to include evidence on the productivity impacts of specialised clusters, such as advanced manufacturing, life sciences and finance. In addition, there is the potential to examine how the strength of the agglomeration impact varies with cluster size and transport mode.

5.3 As well as expansions to the evidence base, there is also scope to improve the methodology, such as the representation of different transport modes and time periods in the estimation of generalised travel costs.

Movement to more/less Productive Jobs and Labour Supply

5.4 The guidance on employment effects currently provides methodologies to estimate the change in the number of people employed and productivity impact due to a relocation of jobs, labour supply impacts and the move to more/less productive jobs respectively. As mentioned in section 4, the academic reviewers made a number of comments regarding these methodologies, in particular the inclusion of corporation tax in the welfare estimate and the consistency of the tax rates in the guidance with prevailing tax rates.

5.5 There is scope to improve the move to more/less productive jobs methodology. Currently, the method outlined in A2.3 Employment Unit, can potentially lead to counter-intuitive results. These are the result of the application of productivity averages rather than context specific evidence. The use of survey based evidence, industry productivity averages or more detailed area wide productivity averages could be explored to develop more detailed guidance.

[13] Professor Tony Venables, Professor Peter Mackie and Dr James Laird
[14] https://www.gov.uk/government/groups/transport-appraisal-and-strategic-modelling-division#joint-analysis-development-panel

Develop the Evidence Base for assessing 'Additionality'

5.6 Transport investments can induce a relocation of economic activity, such that local impacts do not necessarily translate into an improved economic performance at the national level. Understanding the extent of displacement is important for the value for money assessment, which focusses on national level impacts.

5.7 Currently the guidance does not identify empirical evidence to inform judgements about the extent to which local economic impacts displace economic activity from elsewhere in the country. This is due to a lack of robust empirical evidence. An improved understanding of the extent to which local economic impacts are additional at the national level, would require more evaluations of schemes.

Appraising Packages of Investments

5.8 In many cases a transport investment may be only one part of a broader package of investments – transport or non-transport – such as in the case of regeneration or dependent development. This poses challenges when trying to understand which parts of the package are critical for success. On the one hand if the components are assessed individually the appraisal may miss important synergies with other parts of the package, such that the impacts are underestimated. On the other hand, if the package is assessed as a whole it can be very difficult to disentangle the impacts and assign these to individual components. Further work in this area would allow us to develop improved methodologies with which to understand these synergies.

Developing the Evidence Base to value 'Attractiveness' benefits

5.9 Investments in the transport system may induce land use change as a result of improving the 'attractiveness' of an area. The existing approach to estimate user benefits, will not capture these benefits, and where these are thought to be material to a business case, practitioners are guided to use the supplementary economic modelling guidance. Several solutions have been proposed, however until now their application has been limited. The practical testing of competing solutions with the aim of identifying robust approaches could be a useful area of investigation.

Link between appraisal and evaluation

5.10 Evaluation is an important tool in providing the evidence base for wider economic impacts. A key finding from the evidence review of transport by the What Works Centre was that more ex-post evaluation evidence is needed to complement appraisal, and more evidence is particularly needed on employment effects[15].

5.11 The Department has recently published a report with proposals on better linking appraisal and evaluation. This aims to improve the evidence base for appraisal

[15] What works centre for local economic growth (2015) 'Evidence Review 7: Transport'

and allow more valuable evaluation of projects with this goal in mind, so as to understand the extent to which the anticipated impacts were demonstrated in the results. Given the emerging nature of the evidence base, evaluation undertaken on wider economic impacts will be extremely valuable in strengthening analytical methods[16].

Developing practical guidance

5.12 We recognise the challenge that new guidance presents to practitioners. One area highlighted is the difficulty presented in identifying when it is proportionate and relevant to undertake wider economic impacts analysis. Going forward we will look to provide more detailed guidance on the circumstances in which an assessment of wider economic impacts would be relevant. Further, over time we will seek to develop examples of best practice to help raise the standard of wider economic impacts appraisal.

[16] https://www.gov.uk/government/publications/strengthening-the-links-between-appraisal-and-evaluation

6. Continued Engagement

6.1 Collaborative, open and transparent working with our stakeholders has been an important element of our analytical strategy in recent years. We would like your views on the proposed changes to Wider Economic Impacts guidance. The Box below identifies specific questions for consideration and we welcome feedback in these areas and on our plans more generally. These should be sent to TASM@dft.gsi.gov.uk with the subject 'Wider Economic Impacts Consultation' by Monday 22nd December 2016.

Consultation questions:

The approach

1. Does the proposed approach sufficiently balance the trade-off between the transparency associated with a consistent appraisal approach and the potential for more accurate understanding of impacts associated with a context specific approach?
2. Does the proposed use of "levels of analysis" balance the opportunity of a more detailed understanding of impacts with the risks arising from increased uncertainty associated with trying to model and value changes in land use?

Applying the new approach

3. What further advice – if any – should the guidance provide on identifying whether wider economic impacts need to be assessed and identifying the most proportionate approach?
4. Does the guidance accompanying this report provide clear, proportionate and relevant criteria with which to inform assessments of the robustness of supplementary economic modelling?
5. What further advice – if any – should be provided on assessing displacement and what evidence is available to inform this?
6. Are there any changes you think need to be made to the reporting requirements to ensure that these are clear, proportionate and effective in promoting transparency of modelling and analysis?

Priorities for future research

7. What evidence/research do you think could be used to inform the supplementary economic modelling benchmarks?
8. Are there other areas not covered here that we should also be considering in developing our research programme?
9. What do you view as the highest priorities for further research into wider economic impacts?

6.2 Following the end of the consultation period the Department will review feedback and decide what further changes are required to the proposed guidance. In line with the Orderly Release Process[17], the finalised guidance will be published as a forthcoming change[18] before being formally incorporated into WebTAG.

6.3 To support the consultation, the Department will be hosting a consultation launch event to set out the proposed changes to guidance. If you would like to pre-register for this event, please email TASM@dft.gsi.gov.uk with the subject heading 'Wider Economic Impacts consultation' by Friday 7th October 2016

Freedom of Information

6.4 Information provided in response to this call for evidence, including personal information, may be subject to publication or disclosure in accordance with the Freedom of Information Act 2000 (FOIA) or the Environmental Information Regulations 2004. If you want information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

6.5 In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If the Department receives a request for disclosure of the information it will take full account of your explanation; however, the Department cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

6.6 The Department will process your personal data in accordance with the Data Protection Act and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties.

Consultation principles

The consultation is being conducted in line with the Government's key consultation principles which can be accessed on the Gov.uk website at: https://www.gov.uk/government/publications/consultation-principles-guidance. If you have any comments about the consultation process please contact:

Consultation Coordinator
Department for Transport
Zone 1/29
Great Minster House
33 Horseferry Road
London SW1P 4DR
Email: consultation@dft.gsi.gov.uk

[17] https://www.gov.uk/government/publications/change-management-in-webtag-the-orderly-release-process
[18] https://www.gov.uk/guidance/transport-analysis-guidance-webtag#forthcoming-changes

Annex A - Improvements to guidance

1 This section summarises the key changes to Wider Economic Impacts Units in each of the five Units (published online alongside this document).

2 These new units replace the existing A2 Units of WebTAG: A2.1 - wider impacts; A2.2 - regeneration impacts; and A2.3 - transport appraisal in the context of dependent developments. Methods for quantifying and valuing wider economic impacts in A2.1 and A2.3 have not changed with the exception of guidance for appraising Dependent Developments (which has been expanded to cover commercial and industrial developments) and labour supply impacts (the GDP impact is now to be calculated using data on GDP per worker instead of wages for those entering the labour market). The Unit 'A2.2 - regeneration impacts' is being removed.

A2.1 - Wider Impacts Overview Unit

3 This Unit provides high-level guidance to understand, quantify, value and report the impacts of transport improvements on the economy. The majority of the content of this Unit is new to WebTAG.

4 The Unit is structured as follows:

- Section 2 sets out the transmission mechanisms how transport improvements can impact on the economy, the circumstances in which economy impacts are captured by benefits to transport users and when it may be appropriate to quantify a scheme's impact on Gross Domestic Product (GDP)
- Section 3 provides guidance to quantify the impact of transport on the economy. This includes guidance to inform: the appraisal of transport schemes which are expected to significantly change land-use; when it's appropriate to undertake Supplementary Economy Modelling (using methods not set out in the A2 units of WebTAG); uncertainty and scenario testing; and the appraisal of displacement effects.
- Section 4 provides guidance to value economic impacts in terms of welfare and GDP. This includes guidance to approximate transport user benefits for schemes which significantly change land-use, high-level guidance to value Wider Economic Impacts (avoiding double-counting) and guidance to understand the correspondence between GDP and welfare impacts.
- Section 5 provides guidance for reporting the appraisal of economic impacts including setting out the requirement to draft an Economic narrative and guidance for reporting economic impacts in a scheme's Economic and Strategic Cases.

5 Some of the key messages from this unit are as follows:

- New requirement that an Economic narrative is drafted for all schemes to ensure that appraisals takes into account relevant context-specific information (see section 5.2);
- New guidance allows the use of new and innovative methods being used to appraise schemes (referred to as 'Supplementary Economy Modelling') subject to them being assessed against the Department's model robustness criteria (see section 3.3)
- The Unit provides guidance for appraising and reporting a scheme's impacts on jobs and GDP (see sections 4.5 and 6.4); and
- Guidance clarifies how the appraisal of Wider Economic Impacts should inform the assessment of value for money (see section 6.3).

A2.2 - Induced Investments

6 This Unit provides detailed guidance to understand, quantify, value and report the impacts of transport improvements on private-sector investment decisions (known as 'Induced investments'). It also provides detailed guidance to value Wider Economic Impacts associated with enabled developments (known as 'Dependent Developments') and output change with imperfect competition.

7 The guidance for appraising Dependent Developments has been expanded to cover commercial and industrial developments since A2.3 - Dependent Development[19] only provides methods to value residential developments. Guidance for appraising output change with imperfect competition is the same as that set out in the current Unit A2.1 - Wider Impacts.[20]

A2.3 - Employment

8 This Unit provides detailed guidance to understand, quantify, value and report the impacts of transport improvements on employment. It also provides detailed guidance to value Wider Economic Impacts associated with labour supply effects and movement to more/less productive jobs. The methods and assumptions for estimating these impacts are largely unchanged from those set out in current Unit A2.1 - Wider Impacts with one exception.

9 We propose to change the methodology, such that the GDP impact is calculated using data on GDP per worker instead of wages for those entering the labour market from inactivity. This is in line with the original methodology developed, as outlined in the DfT 2005 Discussion Paper 'Transport, Wider Economic Benefits and the Impacts on GDP'.[21]

A2.4 - Productivity Impacts from Agglomeration Economies

10 This Unit provides detailed guidance to understand, quantify, value and report the impacts of transport improvements on productivity by making agglomerations more productive. It provides detailed guidance to estimate

[19] DfT (2014), A2-3 ' transport appraisal in the context of dependent development' https://www.gov.uk/guidance/transport-analysis-guidance-webtag
[20] DfT (2014), 'TAG Unit A2-1 wider impacts' https://www.gov.uk/government/publications/webtag-tag-unit-a2-1-wider-impacts
[21] DfT (2005, modified 2006) Transport, Wider Economic Benefits and Impacts on GDP.

productivity gains from static clustering (assuming no household and jobs relocations) and dynamic clustering (assuming households and jobs re-locate in response to transport improvements).The methods and assumptions for estimating these impacts are the same as those set out in the current Unit A2.1 - Wider Impacts.[22]

M5.3 - Supplementary Economy Modelling

11 This Unit provides high-level guidance to inform methods to value economy impacts not covered in the A2 Units of WebTAG such as Additionality models, Reduced-form models, Land-Use Transport Interaction (LUTI) models, Land-Use Models Influenced by Transport (LUMIT) and Spatial-Computable General Equilibrium (S-CGE) models. While WebTAG includes supplementary guidance on LUTI and LUMIT models (SI - land use transport interaction models[23]) this Unit primarily explains how these models works rather than how they should be used in appraisals.

12 The key change to guidance is that this unit allows the use of Supplementary Economy Modelling to inform a scheme's Economic and Strategic Cases. Nevertheless where such modelling is undertaken it is necessary to report the extent to which the model satisfies the 'model robustness criteria' in section 6. The weight placed on this analysis will be informed by the extent to which the criteria are satisfied.

[22] Ibid.
[23] DfT (2014) 'SI - land use transport interaction models' https://www.gov.uk/government/publications/webtag-si-land-use-transport-interaction-models

Annex B - Academic Reviews

Commentary on DfT Guidance on Wider Economy Impact Appraisal
Peter Mackie
Emeritus Professor, ITS, University of Leeds
July 2016

Introduction

1 The Department's new draft guidance on this topic including the covering paper and appendices adds to over a hundred and fifty pages of text. In many ways this is the next step on a path which commenced with the SACTRA (1998) report on Transport and the Economy, continued with the DfT paper of 2005, Transport, Wider Economic Benefits and Impacts on GDP, and reached the next stage with the TIEP report of 2014. This note is a selective reflection on where the Department has got to on this pathway.

2 The guidance is written at quite a high level of abstraction. This places the onus on scheme promoters and their consultants to work out for themselves how they plan to implement the guidance in particular cases. As with most areas of modelling and appraisal there is scope for good practice and for bad practice. No doubt the Department's officers will be asked for examples of where in their view studies have been particularly good and provided templates and methods which might be followed. A virtual library of what is considered to be good practice needs to be built up to stand alongside the principles.

3 There are clearly issues about how the economic efficiency issues covered in the wider economy impacts section of the guidance are expected to dovetail with the guidance on social and distributional impacts including regeneration impacts.

4 For readers who wish to know the essence of what this guidance says in a few minutes of study, I commend the text boxes in unit A2.1 and the comments below mainly relate to points in these boxes.

Under what circumstances should Wider Economic Impacts be appraised?

5 The guidance is orientated towards appraisal of very major schemes and towards the programme level. It needs to be absolutely clear to promoters that this guidance is to be followed if quantified assessment of the wider economy impacts is considered to be appropriate.

6 For many transport schemes, I think trying to analyse the WEIs is not worthwhile because

- As stated, it is not proportionate to the effort required
- Schemes such as motorway widening on the core network involve hundreds of O/D pairs and it is simply not possible to predict with any confidence what the wider economy impacts will be. For example the current A1 Leeming Bar to Scotch Corner is a major scheme by any standards but is an example of a scheme where estimating the direct transport benefits (plus environmental impacts) at level 1 in para 1.1.10 of A 2.1 is all that is justifiable.

7 I very much agree with the concept of an Economic Narrative which begins with the question 'What is this scheme trying to do, why are we even thinking about doing it?' and proceeds from there to define all the analysis which is likely to be required. This will go through various iterations as the scheme passes through various stages or gateposts. For the generality of schemes, the emphasis should continue to be on developing the modelling and appraisal required for level 1 because good estimates of the wider economy impacts are contingent on good estimates of the direct transport benefits. The narrative should identify what is exceptional about a scheme which justifies a special analysis of some or all wider economy impacts. This is not just a matter of scheme size ; its role in relation to economic development of a city or region may be special.

8 Both for internal decision making purposes and for external (eg Public Inquiry) purposes I would like to see the Economic Narrative being part of the audit trail which enables those involved in the decision-making process to gain a clear understanding of the genesis of the scheme or intervention, the analysis undertaken and the key analytical choices made. These should be in synch with the overall narrative of the Transport Business Case which should also be in the public domain.

Under what circumstances should the impact of schemes on GVA be appraised?

9 This is an important question which the Department has posed. My interpretation of the answer in the text as a whole is:

- Ministers and the public are interested in the impact of public spending on national economic performance and this may warrant reporting in the Strategic Case if it is proportional to do so.
- Regional politicians and officers and the public may be interested in the impact of schemes and policies on regional GVA and may wish to use delta GVA as an indicator for ranking within their programmes.
- The key link between regional analysis and national analysis is the displacement assumption and the default should be that an increase in GVA in region A is 100% offset by a decrease in regions B, C and D. But there will be cases where that default does not apply.
- The GVA effect of the construction activity itself, and any associated multiplier effects is to be removed from the analysis (A2.3 para 2.1.9).

10 Within that interpretation, here are a few points on the requirements for estimating the GVA impacts of transport schemes which warrant particular emphasis :

- Credibility is an issue: a requirement is that the change in GVA should demonstrably relate to the change in accessibility estimated in the transport model. Estimation of the wider impacts should be driven by estimates of the direct transport impacts.
- The macroeconomic assumptions underpinning the GVA estimates should be clear. For example, if the macro assumption is one of temporary underemployment of resources (see the very important para 4.2.6 of the Supplementary Modelling guidance), the conformity of that with Green Book guidance needs to be confirmed. Moreover the narrative should make clear that the structural employment effects of the scheme in the appraisal are for a stated limited period, not for the entire appraisal period.
- The same macroeconomic assumptions should be used in appraising the employment effects and their GVA impacts in the transport sector and in the transport using sectors.
- The closure rules for the capital and labour markets in whatever model is used to estimate delta GVA need to be transparent and acceptable. A description of the way in which interest rates and real wages adjust to clear the market is required.

11 I agree with the Department that the creation of a bridge between the welfare analysis and the GVA analysis to help explain the underlying sources of difference between the two metrics in particular cases would help to build confidence in the overall economic narrative.

Selectivity and Consistency in Transport Appraisal

12 Compared with previous versions of the guidance, this version places significant weight on context specificity and the need for the appraisal shape to adapt to the problem or case characteristics. At one level this is fine – the appraisal of Crossrail 2 clearly needs to have a different shape from the appraisal of a rural by-pass. But it is important to remember that the bulk of the economic appraisal is built on standard values for travel time, safety benefits, noise change etc and that these standard values are not context specific. Most of the wider economic benefits are valued using standard elasticity and tax wedge values so the appraisal is not really bespoke to the individual circumstances. It is more seeking to facilitate value for money comparisons on a level playing field basis across a range of schemes. To a great extent the entire modelling and appraisal process is a metaphor for what is really going on in behavioural terms behind the model. This has implications for the proposed treatment of planning and land use effects in section A2.2.

13 I am comfortable with the guidance as it relates to agglomeration, output change in imperfectly competitive markets and employment effects. There are issues concerned with maintenance of the guidance. For example, best evidence on productivity elasticities may change, or the tax system may change which in turn changes the values of the tax wedges at the extensive and/or intensive margins of employment. In other words, the conceptual

framework may be fine but the empirical content requires periodic revisiting and consistency must be maintained with what CLG, BIS,DWP and the Treasury are doing. After all, Transport is not the lead Department in how to handle employment effects of public investment.

Planning and Land-Use Impacts

14 I am comfortable with the notion that transport schemes have planning and land use impacts and that sometimes developments at particular locations are contingent on infrastructure which opens up parcels of land or transforms their accessibility or provides an opportunity around which to replan or regenerate a local area. Such impacts figure strongly in the strategic case in a spectrum from supporting argument to fundamental rationale for the project. This is fine; my concerns are with the place of these impacts in the economic case. Here are my reservations.

15 At the level of principles, I agree with Mohring's arguments that land value changes are in general pecuniary rather than technological externalities and are in general transfers from the direct transport benefits rather than additional. For such benefits to be additional, it is essential (a) that the land market failure be identified and (b) that there is no significant overlap with either the direct transport benefits or the agglomeration effects and other WEIs.

16 It follows from this that the issue of the treatment of displacement looms large. Just because a scheme induces the development in a particular location does not mean that there is a net change at area level. An area-wide approach is going to be required in which the shape of the city or region in the do-something relative to the do-minimum will have to be modelled. This has been challenging ever since SACTRA 1998 although I understand that recent work on the ULTRA model shows that progress is happening in this area (Simmonds, 2016). The ultimate goal is a consistent appraisal account of the transport, land and economic development trajectory of a city region.

17 My reading of unit A2.2 section 3.1 is that this section relates to what should be done where transport investment is expected to open up particular plots of land for development but we don't have a model which reflects induced land use change. It seems to me that the tone of the Guidance (3.1.9, 3.3.3-4) is notably cautious and quite restrictive.

18 Nevertheless I am not convinced that this section of the Guidance meets the Department's usual criteria of prudence and robustness. I have no difficulty in accepting that induced land development is often a goal of a scheme and, subject to evidence, part of the strategic case and via S106 part of the financial case. But I think accepting an off-model estimate of net induced land value as a robust number to be added to the user benefits in the economic case is asking a lot both of scheme promoters and of the scrutiny process. It is going to be difficult to establish when the burden of proof has been securely met.

Conclusion

19 Overall this guidance is an appropriate response to the TIEP report and represents progress.

- The Department will need to commit resources to establishing good practice guidance to sit alongside the principles. In a devolved world, DfT's role as the leading hub of knowledge to whom promoters and others can look is vital.
- Absolute clarity of the macroeconomic assumptions to be followed if GVA estimates are to be part of the transport business case is essential. The creation of a bridge between the GVA and welfare metrics is very desirable.
- I support the guidance on agglomeration, employment and output impacts ; parameter values will require maintenance.
- I have reservations, discussed in paras 14-18 above, about the guidance on the appraisal of dependent development of specific sites (A2.2 section 3).
- Given that many transport schemes are created in order to impact on city region development, further progress towards integrated land-use, economic development and transport modelling and appraisal is highly desirable.
- However, proportionality of appraisal needs to be emphasised ; attempting to estimate the wider economy impacts for all schemes is not proportionate. The economic narrative should be used to set out the appraisal requirements for specific applications.

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Review of Guidance for Wider Economic Impacts
James Laird
21st July 2016

1 Introduction

This report presents a peer review of the five new TAG units that address the appraisal of wider economic impacts in WebTAG. They have been reviewed against:

- the extent to which the updated units implement the Transport Investment and Economic Performance (TIEP) recommendations;
- the logic of the approach and its coherence across the five units; and
- the robustness of the methodologies and evidence base.

In undertaking the peer review I have therefore taken as a starting point the TIEP report. The TIEP report was structured along the lines of user benefits, productivity impacts and investment and employment impacts. This flows from the conceptual standpoint that the Economic Case comprises of direct benefits (the user benefits) plus benefits in secondary markets if market failures exist. The latter being the wider economic impacts related to productivity, investment and employment effects). Central to these arguments are the location decisions of firms and households. In the transport appraisal parlance – this is land use change.

The TIEP report concluded that the DfT appraisal guidance provides a rigorous framework but needed extending and improving "to more fully capture (and critically evaluate) the economic impact of transport investments" (Venables et al, 2014 p4). There were seven recommendations in total and these fall into 4 areas:

1 There needs to be more coherence between the different elements of an appraisal (both between the different cases of the Transport Business case and the different elements of the Economic Case)
2 There is a need for context specificity to the appraisal
3 Land use change needs to be incorporated into appraisal
4 Better reporting of, transparency in and promotion of best practice transport-economy modelling methods.

I have structured my review around these four areas in which the TIEP recommendations lie preceded by a consideration of the structure of and between the new units.

2 Structure of the wider economic impact units

My view on the structure of the document is that it is much improved from the existing guidance. The overview document sets the scene and the other notes focus around the different market failures. I think it is important to separate employment and investment impacts from the agglomeration impacts. In the existing guidance this important distinction gets lost – given the complexity of the advice that needs to be given to estimate the productivity impacts.

The overview document is an important note in that it provides the overarching structure and logic. Within each note there then follows sections on understanding and then valuing the impacts. This provides a strong structure and also importantly links in to the Department's overall approach to appraisal (UVTI). Thus messages across the appraisal space are re-enforced.

Of course however one cuts the cake, one has to cut it – and at the margin between the slices there can always be arguments for including an effect in one guidance unit and not in another. The most obvious one is the treatment of the market failure caused by labour taxes on dynamic clustering. On balance I support its inclusion in the employment unit (and not the productivity note) as the market failure stems from the labour market – which that guidance note is aimed at. This of course requires good cross referencing between the units. On balance I do not see a compelling argument for further re-structuring, it has probably been taken as far as it can.

The five new units are clearly a substantial and substantive contribution to WebTAG. Stylistically though at some 143 pages and 56,000 words I found the combined contribution to be long and to contain repetition (e.g. on reporting requirements). However the nature of appraisal guidance units is that they need to stand alone, as they are not read as consecutive chapters of a book. The length and repetition is to an extent therefore likely to be necessary. Additionally some of the ground that these units are covering will be new to the audience and reinforcement of key messages is important. Over time as the methods and techniques become part of standard practice it may be possible to do some streamlining, but for the moment it is likely that length and repetition is an aspect of the new units one has to live with.

The new guidance is carefully structured around market failures – as the TIEP study was. This is a positive aspect and makes the link to the Economic Case explicit. There is no additionality to user benefits unless a market failure occurs. The guidance adheres to this principle in every respect with one notable exception – the treatment of taxation where it follows the approach adopted in the existing guidance. In places tax revenues appear to be treated as a benefit per se. This is however not a general case. Taxes that distort prices lead to a misallocation of resources and the presence of a deadweight loss. Transport projects that lead to changes in prices and demand in secondary markets (where prices are distorted by taxes) can therefore generate surpluses additional to user benefits[24]. Venables (2007) identified labour taxes as distortionary, and a careful analysis of transport induced changes in the labour market identifies that changes in wages and the demand for/supply of labour would lead to an additional surplus equal to the labour tax revenue generated for the marginal worker. In the case of the UK this is the change in income tax on earned income plus the change in national insurance contributions (NICs).

Other distortionary taxes in the UK include indirect tax (VAT) and corporation tax. Indirect tax has a similar distortionary effect on the price of goods and services as income tax has on the price of labour. Changes induced by a transport project on the quantity and price of goods and services will therefore generate an additional surplus in the goods market equal to the change in indirect tax revenues. Corporation tax, a tax on profits, affects rates of investment. An interesting aspect of this tax is that the market in which it is levied (effectively the market for goods and services) and the market which is distorted (investment in capital) are not the same. The market that is distorted is that of capital. The level of distortion associated with corporation tax in an open economy is also a complex

[24]Taxes can also be used to correct for externalities. In these situations there is no deadweight loss and taxes are corrective rather than distortionary. Revenues from such 'price correcting' taxes are not additional to user benefits.

function of varying levels of taxation in other countries (affects rates of investment in a country) as well as personal and dividend taxation rates (affects rate of firm start ups). My search of the literature does not identify any recent work on the size of the distortionary effects of corporation tax and none that relates specifically to the question of interest.

Bringing the discussion in the above two paragraphs together. For consistency with the structure of the wider economic impact units arguably the Employment unit should focus solely on the market failure associated with employment only (i.e. labour taxes). The inclusion of corporation tax in the Employment unit is arguably confusing. The effect of corporation tax distortions on changes in welfare arising through a transport investment would also be better placed in the Induced Investment unit, as they are associated with capital. There is a further argument for including changes in indirect taxation revenues (due to expanded output) in the units. These would be best placed in the Induced Investment unit too as it is that unit which is concerned with changes in output. There therefore remains a need to unbundle the market distorting effects of the different taxes thereby placing the welfare impacts being calculated on a firmer footing. A re-visiting the marginal rates used in the guidance for calculating welfare impacts would be a natural part of this process – as these two have been brought through from the existing guidance.

A final small but important point regarding the structure of the new units is that TAG Unit A2.4 is called the “Appraisal of Productivity Impacts”. However, the unit only concerns changes in productivity due to agglomeration economies. User benefits also encapsulate productivity impacts (e.g. business and freight time savings) and these are not mentioned in the unit at all. Empirically the productivity impacts associated with user benefits are much more important than those associated with agglomeration economies (invariably an order of magnitude bigger particularly for inter-urban projects).

3 Coherence between the different elements of the appraisal/Transport Business Case

Aside from the re-structuring of the existing guidance into the five units the most obvious other change is the effort made to link the Strategic and Economic Cases through an Economic Narrative. The Economic Narrative also informs the economy modelling choices and the inclusion or not of different market failures in the Economic Case. This is a substantial contribution from the previous guidance and is consistent with the TIEP recommendations in this area.

The inclusion of the narrative has improved coherence between the different cases in the Transport Business Case and also between different elements of the Economic Case. This is reinforced with firm guidance regarding the focus of the units (on welfare analysis) and their positioning as part of the Economic Case in the Transport Business case. GVA analysis should only appear as part of the Strategic Case. Further guidance is given on ensuring that there is ‘a bridge’ between the Strategic and Economic Cases. The guidance goes to some efforts to make these points and this is one of the sources of repetition within and between the units - but as discussed earlier such repetition is likely to be needed to ensure these points are got across to the audience. In practical terms it is likely that effective gatekeeping within the DfT will be needed in the short to medium term so that stakeholders preparing appraisals adhere to these principles.

To ensure consistency with other elements of the Economic Case and other wider economic impact units there is a need to ensure that prices are in the same price base – which for WebTAG is market prices. Care needs to be taken here. The Productivity unit

uses GDP, the Employment unit uses GVA, and the Induced Investment unit uses land values – which will be perceived differently by households (in market prices) and businesses (in factor prices). User benefits, the basis for the calculation of the additional output effects under imperfect competition, are in market prices (i.e. include indirect taxes). The Overview unit suggests welfare impacts can be calculated by summing across different impacts and the Supplementary Modelling Unit suggests GDP impacts can be calculated by summing across these impacts – but the prices would need to be converted to the appropriate price base first. It would for example be inappropriate to add the GDP impacts from the Productivity Unit to the GVA impacts from the Employment Unit to calculate the total change in GDP. Similarly before inclusion in the Economic Case the prices form these wider economic impacts would need to be converted to market prices where relevant.

4 Context specificity

The Economic Narrative makes substantial improvements to the aim of achieving context specificity in an appraisal. The introduction of the three levels of appraisal of wider economic impacts is also greatly beneficial to achieving this aim.

The existing guidance already contained context specific advice regarding the appropriateness of agglomeration economies to a project – through the definition of functional urban areas. That is one would only assess agglomeration economies if they were expected to be relevant. This advice has now been added to with the new units being very open about a broader range of economic responses and market failures (e.g. localisation economies). The analyst is permitted to examine these where relevant with the justification appearing in the Economic Narrative. For these types of Level 3 (major scheme) appraisals we would expect the analysis to be quite context specific as a consequence.

However there still seems to be some elements of ‘routineness’ in the discussion of the mechanistic labour supply model and model for imperfect competition that form part of a Level 2 appraisal. The continued routine application of these models to every investment being appraised (as currently happens) will lack context specificity. Take the labour supply model – labour supply effects will be far more relevant to projects aimed at improving the quality of commuting than ones aimed at improving inter-city connectivity (e.g. 10 mile improvement on the M1).

Part of ensuring that the wider economic impact calculations are context specific is how local accessibility is included in the model. On reading the guidance on agglomeration impacts I was unclear what the advice was regarding the formulation of aggregated generalised cost: across time periods to produce an all day value; across private modes (car, cycle and walk) to produce a private mode value; and across public transport modes (bus and rail) to produce a public transport value.

For the labour supply model the treatment of modes is explicit but the equations again seem silent on time periods. How the generalised costs across time periods and modes are combined can have a strong influence on for example the change in economic density.

5 Land use change

The TIEP recommendations were very clear regarding the incorporation of land use change in appraisal. Land use change is central to the economy impacts of a transport investment. Arguably local authority stakeholders no longer ‘do’ ‘major’ transport projects

and instead undertake projects that are cross-sectoral. TIEP in addressing this was therefore clear in recommendations (3), (4) and (5) that private sector decisions need to be placed centre stage in the appraisal of major transport infrastructure if the economy impacts of transport investment are to be better encapsulated.

In addressing these recommendations there has been a significant shift in the DfT position on the treatment of land uses. Previously land use was to be held fixed, but the in the new guidance changes in land use are now explicitly recognised. They enter the appraisal in several ways:

- Changes in traffic flows and associated external costs on safety and the environment from changes in land use;
- The valuing of dependent developments; and
- The ability to use economy modelling which explicitly models changes in land use.

This shift in position by the DfT and the associated guidance contained in the units is therefore a major step forward.

Having said that where the units can be critiqued is in the decision to base user benefits on fixed land uses and then try to add in the benefit of the dependent developments separately whilst subtracting the costs of the developments (in terms of increased congestion etc.). Effectively the guidance is trying to adjust expected changes in land prices to capture the change in user benefits. Why not just measure user benefits? The argument advocated in the units for not doing so is that the rule of half breaks down 'significantly'. However, the limited evidence to date suggests errors of between 0.5% and 6% on practical scheme appraisal and up to 20% taken from a more theoretical perspective (Laird and Venables, 2016).

Arguably the errors associated with measuring the value of dependent developments, as proposed in the guidance, could be large. Fundamentally there is a need to obtain good quality land value data and data on the costs of development as well as estimate the external costs of the development traffic. Displacement costs (or reductions in land values elsewhere) are also needed. These are not trivial data, particularly in areas where planning consent attracts a land value premium[25]. The proposed method in the guidance is not therefore error free.

Furthermore the proposed method is arguably open to politicking by stakeholders who claim developments to be dependent when they are not – a form of optimism bias. A dependency test is included in the guidance, but arguably this is weak because it is based on an argument surrounding planning consents. Ironically despite this test being weak in rejecting Type I errors (accepting a non-dependent development as dependent) the test is likely to be prone to Type II errors (rejections of positive cases). An example of a scenario where this test would create a Type II error would be the opening of a train station which induces residential development in a rural area where the existing roads and train service are operating below capacity.

One area where a land value uplift approach is one of the principle practical options available to analysts is that of complementary investments. Investment in transport

[25] In such situations the planning consent premium will need to be eliminated from any land value uplift.

infrastructure and other aspects of urban development occur simultaneously and are complementary to each other. The difficulty in these situations is that there is more than one 'primary' market for the interventions. The solution to the problem is either to look at changes in secondary markets, such as the land market, or use economy models capable of measuring the welfare benefit across multiple markets. The Induced Investment unit gives clear guidance here. A weakness though in the guidance is that analysts are not required to set the benefits of the complementary investments against all the costs. There is a risk here that these absolute benefits of a complementary investment become mis-represented as benefits net of costs.

The guidance also advises that land value uplift on dependent developments be used to value distortions in the land market (imperfect competition, co-ordination failure and land rationing). A challenge in deriving good estimates here is not only understanding the benefit – which is directly observable as the price increment individuals are willing to pay for developable land – but also to understand the full opportunity costs of development. The latter would include the value placed by local communities and society in general on leaving land undeveloped and is not directly observable. Using the "default assumptions for the amenity values of different types of land" as suggested in the guidance is unlikely to be a good proxy for this as it will not reflect local conditions. If land rationing or co-ordination failures measured using land value uplift are to be used as an argument to 'talk up' the benefits of dependent developments, the onus needs to be firmly placed on the analysts to demonstrate for example that: the local planning system is inefficient, and to use an evidence based method to derive the opportunity costs of developing the undeveloped land (e.g. a willingness to pay survey).

A fundamental element of allowing land uses to vary is that these changes need to be valued. There are analytical and data challenges in this. Whilst the land value uplift approach has been advocated in the guidance there is a risk that inadequate data and analytical capabilities may create some seemingly large benefits when the method is applied. As a control or benchmark case it would seem sensible to also require a user benefit measure under variable land use to be set next to any estimates of land value uplift from dependent developments – with explanations for large deviations between the two to be justified. This is on the basis that firstly the textbook position is that land value changes are pecuniary externalities of user benefits, secondly on the evidence available to date that measuring user benefits using transport costs alone when land uses change is likely to generate an error of less than 20%, and thirdly that the opportunity costs of land use change may not have been fully captured in the land value uplift analysis.

6 Transport-economy modelling methods

A past criticism of DfT practice was a conservative approach to economy modelling methods. This arguably has held back the inclusion of the economy impacts of transport investment in appraisal. The new guidance is explicitly open to the use of economy modelling methods, and appropriately this has been placed within the modelling units of WebTAG. The guidance also avoids being prescriptive and instead is informative and sets standards which need to be achieved in the modelling. This is a very positive development and in my mind well aligned to the TIEP recommendation in this area. This is of course only the start of the road for the DfT in this area and it will be necessary for the Department to upskill its personnel in the field of economy modelling so that effective gatekeeping and peer reviewing of methods can be undertaken. The foundations however for this journey seem solid to me.

A minor comment: rather than refer to model applications for further reading as has been done for the S-CGE modelling some standard texts would be more neutral. In addition to the Brocker and Mercenier (2011) book chapter already cited would be a Brocker (2015) book chapter and Dixon (2013) – a comprehensive textbook.

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Reviewer comments: Wider Economic Impact Appraisal.

Tony Venables, 20/7/16

Principles:

The three main changes proposed in this report are welcome, and are broadly in line with the recommendations of the 'Transport Investment and Economic Performance' report of 2014.

The proposals are, first, to make appraisal more context specific by developing an economic narrative of what the project is intended to achieve and using this to inform the economic appraisal that is undertaken. This should make appraisals more relevant and bring the important advantage of linking the strategic case and economic case.

Second, to systematically set out different 'levels' of analysis to be undertaken, increasing from level 1 (standard estimate of user-benefit) to level 3 (involving supplementary modelling to quantify changes in the economy). This is valuable to ensure proportionality in the scale of analysis undertaken for different projects and, importantly, to ground all project appraisals in a simple level 1 analysis. It should increase clarity in understanding exactly what is driving results in moving to level 2 and 3 studies. The approach also offers a way of creating alternative 'scenarios' conditional on whether or not other complementary policies are being implemented.

Third, the report accepts that reporting GVA changes may be of interest, particularly to link with the strategic case. Importantly, it requires that this be done alongside welfare analysis, with deviations between the two cases identified, quantified, and explained.

Economic Analysis:

The economic analysis underpinning the proposal is generally well-grounded in the theory of market failure, i.e. (i) Recognising that wider impacts occur only when there are changes in quantities (such as output or employment) in activities where the market mechanism has failed (for some well-diagnosed reason) to equalise marginal social costs and benefits. (ii) Recognising the importance of displacement, and hence the need to see changes in an economy wide perspective, not simply in the neighbourhood of the project.

The 'levels' of analysis approach maps well into these economic principles map, with different levels capturing more complex economic environments and a richer menu of market failures.

The 'wider impacts' that are potentially to be included in appraisal are discussed under three headings: Induced investment, A2.2: Employment effects, A2.3: Productivity impacts, A2.4.

Induced investment: This is an important issue. While discussion is generally sound I have two remarks. First, this is an area where a very careful diagnostic of underlying market failure is needed. Statements that changes in land-use cause existing methodology to 'break down' are not very helpful. Existing methodology simply needs to be augmented with analysis of the market failures that may lead induced investment to create (or destroy) net social value. Systematically laying these out is an area where more research needs to be done.

Second, there are risks of double-counting particularly once changes in land value are regarded as a possible measure of welfare change. The issues are discussed in the paper, but remains a further area for future research.

Employment effects: This is an area where analysis has to be underpinned by a context specific economic narrative of why a scheme might change employment levels, where additional workers come from (displacement), and why, in the initial situation, productivity levels might differ across space. A transport improvement might create wider benefits through quite different mechanisms, some to do with direct effects of the transport improvement (e.g. easier travel to work increasing participation), others to do with induced investment, and some to do with agglomeration and productivity. The report shows awareness of these issues, but more guidance may be needed for practitioners undertaking appraisals.

Productivity impacts: There is well-established good practise in this area, and this is captured in the report. The main outstanding issue is to do with separating out the role of a particular travel mode in supporting agglomeration, and thus the effect of improvements in this mode.

Implementation:

Expositionally, it is appropriate to break out the arguments into the three different units A2.1-3. However, this creates some difficulties for implementation. One underlying economic change may have effects in all three units: an induced investment may bring with it economic surplus, change employment, and raise productivity. Approaches will have to be consistent across units. Relatedly, division into units increases the risk that treatment becomes mechanical, rather than context specific.

Reporting:

The Economic Impact Report is a good innovation, although its content remains to be shaped through experience with some projects. There is a danger that reporting will become excessively fragmented, as the Economic Impact Report will sit alongside the other five cases. It is unclear how this will work in practise.