



Department
for Transport

Appraisal and Modelling Strategy Consultation

Consultation Responses

Responses 1-20

Moving Britain Ahead

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Introduction

In 2018 DfT consulted on priorities for a new appraisal and modelling strategy¹, presenting an ambitious vision for developing our appraisal and modelling tools over the next five years. This document contains unedited responses to the consultation where permission has been given to publish. It contains the vast majority of responses and is for the most part representative of the views expressed. We are publishing the responses in the interests of openness and transparency and it should be noted that they do not necessarily reflect the views or policy of DfT.

¹ <https://www.gov.uk/government/consultations/transport-appraisal-and-modelling-strategy-informing-future-investment-decisions>

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Appraisal and Modelling Strategy Consultation

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1. Introduction

Our responses from Aimsun Ltd. to the 13 questions posed in the consultation document titled “Appraisal and Modelling Strategy: Informing Future Investment Decisions” dated June 2018 are presented here. They represent the views of Aimsun Ltd. a supplier of transport modelling and simulation software a subsidiary of Aimsun SL based in Spain and now owned by Siemens Mobility GmbH.

In this document we will refer to static models, those models that do not consider the evolution of supply and demand in time (unless there are consecutive assignments such as in a variable demand model) and use a macroscopic network loading. We will also refer to dynamic models, those models that do consider the interaction between supply and demand during the simulated time, use a microscopic or mesoscopic network loading and in which individual vehicles respond to dynamically changing conditions.

We will also refer to integrated models and modelling with proportionality. This refers to a modelling system in which the descriptions of the road network, the private vehicle demand, the public vehicle demand and the control systems applied to the road network have a common representation in the suite of transport models. In an integrated modelling system, data transfer between different levels of model from a strategic static assignment model to a localised operational model is more readily facilitated with integrated processes and consistency between models at different scales is ensured.

In modelling with proportionality using an integrated modelling suite, the analyst will select the most appropriate class of model for the proposed development under study and develop that model using the common representation of the traffic network and the demand placed on it held in the integrated system. The goal being first to assess the scheme with the class of model best suited to the scheme criteria and second, to be able to reflect the changes to the network or the demand on the network readily in the other models in the integrated suite.

Two of the authors of this response were participants in the EU COST project MULTITUDE¹. One of outputs of this project was a worldwide review of transport modelling guidelines, specifically those for microsimulation. We recommend that document as a reference for this exercise in revision of WebTAG².

¹ <http://www.multitude-project.eu/>

² <http://publications.jrc.ec.europa.eu/repository/handle/JRC88526>

2. Consultation Questions

2.1. Priorities

1 Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

There are two themes in the development that we feel are critical going forward:

- 1) Making better use of the current guidance.
- 2) Developing the guidance to incorporate new developments in modelling, in new data sources, and new requirements in wider assessment.

With regards to the first; WebTAG must evolve in pace with progress with transport modelling developments; the current requirements imposed on models, such as convergence and the uncertainty surrounding results are based in ageing practices and should be reviewed. Ideally, guidance should be set separately for different classes of model and assessment purpose, recognising the relative strengths of different tools, such as strategic models with a static assignment, dynamic simulation models in congested networks and models used to evaluate operational and traffic management strategies.

There is also a culture in the industry that treats WebTAG as a set of rules, rather than as a guidance document. We would welcome further engagement with the industry in order to develop a culture of WebTAG usage that is within the spirit of the description of it as guidance.

The second theme revolves around incorporating new developments in modelling; in the use the transport network and the new intelligent mobility technologies applied to it; and in the inclusion of wider measures such as social justice and sustainability (expressed as people and places) in assessment. We cannot predict what these developments will include and would advocate an approach in WebTAG that is inclusive of innovation. In linking this to the first theme, we emphasise the need for WebTAG to be seen as guidance, which includes the application of emerging techniques, rather than as a rule set based in long established techniques.

DfT should also seek to develop existing data sources and find ways to increase the quality and quantity of available data to increase confidence in the modelling exercise.

Along with the two themes mentioned above, we feel that an additional theme around analytical assurance should also be considered by the department. The Aqua book analytical

assurance requirements³ have filtered down from the DfT interpretation, as set out in DfT Analytical Assurance framework “Strength in numbers”⁴. We would welcome developments in WebTAG to embed a culture of robust, high quality analysis within it.

2 What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

We believe that the immediate priority should be on the first of the themes discussed in our response to question 1. This should include engagement with the industry to further position WebTAG as guidance and not rules, with the development of advice on application and interpretation.

Furthermore, at present there is a shortage of skills within the industry. One high priority in the short term should be to work with stakeholders in order to find ways to streamline the processes within WebTAG, while still ensuring a consistent approach and robust analysis.

2.2. People and Place:

3 What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

In our response to this question, we will focus on the transport modelling aspect and leave the social and economic aspects of such assessment to others.

Sustainable development should focus on alternate means of transport from the dominant modes of private car and public transport. Assessment of walking and cycling should be included in appraisal as should developments in MaaS and in innovative transport developments based in CAVs. Further study is needed in how to fully capture the benefits of active mode schemes, innovative schemes, and public transport developments. These historically struggle to achieve good BCRs as the analysis techniques applied to these are limited relative to those applied to private car users. In many studies the emphasis is on how the reduction in car travellers will benefit other car travellers, rather than on the benefits for PT and active mode users directly influenced by infrastructure improvements.

³ <https://www.gov.uk/government/publications/the-aqua-book-guidance-on-producing-quality-analysis-for-government>

⁴ <https://www.gov.uk/government/publications/dft-analytical-assurance-framework-strength-in-numbers>

Methods of modelling transport emissions have evolved in parallel with developments in transport modelling and in appraisal of the environmental factors of a transport scheme, WebTAG should adopt the same principles as those advocated for transport modelling: not to be based in current practice, but to be inclusive of innovation, and to function as guidance, not as rules.

2.3. Reflecting Uncertainty

4 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

There is a generic set of aspects of transport assessment uncertainty:

- 1) Modelling
 - a. Sensitivity and uncertainty analysis
 - b. Selecting an appropriate class of model
 - c. Data integrity
- 2) Communication
 - a. Interpreting results
 - b. Perceptions of uncertainty
- 3) Future environment for transport development
 - a. Envisioning
 - b. Scenario Planning

We recommend this as a list of priorities.

In #1, uncertainty in modelling, the guidance should ensure robust models are provided which are not sensitive to calibration parameters and that uncertainty in the model outputs is measured and its sources described. We would refer DfT to an EPSRC funded project MUCM (Managing Uncertainty in Complex Models)⁵ for advice on uncertainty and sensitivity analysis.

In #2, communication, the priority is education of stakeholders in transport assessment to help them work with forecasts that contain uncertainty.

The third priority is in guidance for envisioning the future environment, or possible environments for transport developments. The highest sub-priority here is developing a common set of definitions and defining the class of uncertainty being analysed. The word scenario for example is heavily overloaded referring to anything from a simple option test of a well-defined change to a speculative description of a potential technological and

⁵ <http://www.mucm.ac.uk/>

sociological future. WebTAG Module M4 (Forecasting and Uncertainty) demonstrates the problem as it moves between application of prescribed high and low growth demand factors described as “Scenarios” and a number of user defined sets of consistent alternative options also described as “Scenarios”. It however does not refer to “Scenario Planning” which is a commonly used technique in developing “Scenarios” as tools to envision multiple possible futures.

5 What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these??

When adopting more sophisticated approaches, there is a need to make sure these are applied in a consistent manner to ensure that the outputs from the Department’s portfolio of projects are comparable for decision making. Advice on processes to keep models as consistent as possible, especially in integrated multi scale models should be developed.

2.4. Modelling and Appraising

6 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

No response supplied, this is outwith our remit.

7 What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

No response supplied, this is outwith our remit.

2.5. Supporting the application of WebTAG

8 What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

Dynamic simulation models are now an industry accepted approach to understanding a wide range of transport schemes, however, at present WebTAG is written to specifically support static macroscopic modelling and the levels of “convergence” they can achieve while denying the stochastic nature of traffic demand. There is a general need to review the acceptability requirements for dynamic models, which as a Monte Carlo simulation can include variance in demand and behaviour, and what level of convergence, and stability requirements are to be expected of them. While convergence is less stable in these tools, they often perform much better than strategic models on validation, given their small area of focus and greater data

requirements. They are also capable of other types of validation, not possible in strategic models, such as queue validation.

This is compounded by the observation that WebTAG is often interpreted by authorities as “rules” and also interpreted too strictly, probably by authorities fearful of legal challenge to their decisions. As a result of this, analysis is biased towards a class of models around which these rules have been developed.

The main remedies to this problem are:

- Development of methods of quantifying model stability more appropriate to the different types of model in use and recognising stochastic variance in simulation models.
- Advice on applying WebTAG as guidance and not as rules, this point is expanded in Q9.

Also, there are elements of the DMRB guides to modelling which have not been fully transferred to WebTAG, while much of the information in these sources is now obsolete. Ideally, there should be a single, complete source of guidance.

9 What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

Identify when each different type of model is appropriate as in the FHWA guidance in their Traffic Analysis Tools Guidance: Volume 2 Volume II: Decision Support Methodology for Selecting Traffic Analysis Tools⁶ and complement this with similar advice on selection of the calibration and validation criteria for each class of model.

DfT should also provide examples of the application of WebTAG where the guidance has been interpreted and applied with some flexibility. The use of phrases in WebTAG such as “common sense” is laudable, but imprecise. Examples will go some way to interpreting such phrases.

10 How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

The role led restructure was good in that it focussed WebTAG for different roles. For the next level; we advocate the use of technology. i.e. a Wiki approach, or AI led guidance to

⁶ <https://ops.fhwa.dot.gov/trafficanalysistools/index.htm>

lead analysts to the parts of WebTAG most relevant to their job role, and to the context and purpose of the assessment.

Formation of a WebTAG forum to share best practice and to communicate developments in guidance to industry is also recommended.

2.6. Developing Modelling and Appraisal Tools

11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

Engage with software suppliers. There is a perception that they are kept more “at arm’s length” than the consulting industry and academia for sound reasons of commercial impartiality. However, the suppliers are the stakeholders whom the DfT indirectly relies upon most of all, and as there are in fact just a few of them who are both active and credible in the market, then they are arguably more important.

12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

Acceptance of the results of newer tools. Dynamic assignment models have been with us for decades yet WebTAG barely acknowledges their existence. Their use in the market is despite WebTAG and accepting the results from them can be a barrier to their use. There are two priorities here (a) catch up with current practice and (b) create a culture which is more receptive to new techniques.

Where innovation is needed to support the appraisal of specific projects, the Department should provide funding to support research and pilot studies to evaluate and test innovative approaches with the view to updating guidance as needed. These studies could run alongside an existing project to provide a realistic test case on which the new techniques can be assessed.

DfT should however make sure they use the best evidence in assessing new techniques. Section 8.14 refers to Systems Dynamics modelling, a technique applied in policy and economic modelling. This has in the past has been proposed as a novel method to model the interactions between travel, economics and policy, and some models have been built i.e.

the MARS model⁷. However more recent research i.e. Shepherd (2014)⁸ recommends that they are now used to facilitate communication and system exploration rather than to undertake quantitative assessment.

13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

There are developments in modelling with proportionality and integrated modelling in which an integrated set of transport models can be developed with wide area models using static assignment methods which share common data on demand and traffic network conditions with smaller dynamic assignment models.

The issues they address are in the ability to readily place a localised development into a wider context to assess changes in traffic flows without having to simulate the entire area at the same level of detail which was required to assess the localised impact. Examples of this approach already exist; a mesoscopic simulation of a motorway and trunk road network uses embedded microsimulation pockets at critical junctions or merge-weave sections where developments are planned. Similarly, city models adopt a 3-level scheme of a static assignment of the strategic traffic and the surrounding buffer area with a more focussed dynamic model using mesoscopic simulation, microsimulation, or a hybrid of both to model the city.

The benefits are in cost savings in modelling as networks and demand are no longer duplicated in different software packages, a reduction of errors in data transfer between model levels, and in ensuring consistency between model levels.

We would welcome inclusion in WebTAG of guidance to the development and application of such integrated models.

⁷ Pfaffenbichler, Paul et al. (2010) A system dynamics approach to land use transport interaction modelling: the strategic model MARS and its application. Systems. Dynamics. Review. 26, 262-282

⁸ S.P. Shepherd (2014) A review of system dynamics models applied in transportation, Transportmetrica B: Transport Dynamics, 2:2, 83-105

File Note

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Prepared by	Csaba Kelen, Lynne Miles, Adriana Moreno Pelayo Matthew Dillon	Date 15 October 2018
Subject	Arup Response to WebTAG Consultation Questions	

Introduction

Thank you for the invitation to take part in the recent WebTAG consultation. Overall, we feel that the Department's WebTAG framework has been a leading framework for developing economic cases, when compared with other Government Departments, and on a global scale. WebTAG's influence on the decisions that have been made by the Department, and those made by other funding bodies, has been substantial. Nevertheless, we welcome the recognition by the Department that to remain world-leading, WebTAG should evolve.

Below is Arup's response to the individual consultation questions.

Priorities

1. Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?
- We note that in practice, the appraisals carried out under WebTAG remain dominated by travel time savings, and for public transport schemes, those that are downstream impacts of journey time benefits (such as highway decongestion and marginal external costs). We suggest that a research priority for the Department could be to investigate the long-term impacts of those travel time savings, what happens to them, and the extent of trading for other benefits. Potentially, this could open up a new lens through which to view transport appraisal. It would build on the work done by Arup, Accent and ITS Leeds (2015), the work of Professor Metz (2017, various), and the critique of Metz's proposals from Profs Mackie, Worsley and Batley (2018).
 - Secondly, this brings in the question of transport and land use interaction. We welcome the increased emphasis placed on this, especially since the Venables report (2014) and the DfT's Wider Economic Impacts Guidance (2016). More recently, transport's impact on land use has

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been further emphasised, through two key drivers – the political importance of housing, and wider questions of how transport can contribute to other government policy areas, and the sharper focus on additional funding sources that has led, among many of our clients, to investigate optimising land value capture. Location externalities (agglomeration) and induced land use changes to the transport schemes need to be assessed by a transport-land use interaction model (LUTI). To this end, we welcome the DfT's goal to review domestic/international practice. DfT will also need to identify available software tools and recommend appropriate ones for use. The calibration of such models against the local economical, physical and policy context is complex and needs to be subjected to further research.

- Furthermore, we note that existing land use transport interaction models (LUTI) are costly to develop and to run, and hence are not relied upon by clients, and are offered on a bespoke basis by a very small number of consultancies. We suggest that the Department could look at ways to overcome these barriers to use, and also increase the transparency of these models. Potentially this could involve dedicated consultation with the supply industry, following the model of Arup's recent Maintaining a Robust Valuation of Travel Time Savings (2018) commission from the DfT.
- Thirdly, the worthwhile devolution and rebalancing agenda, although mentioned in the introduction to the WebTAG consultation documents, is not thoroughly addressed in the subsequent research priorities. We suggest that given the relative urgency of a need for more guidance in this area, this should take a priority. This might include assessing the impact of transport investment on local economies (for example, looking again at the question of zero net employment at the UK level for transport schemes, or at least highlighting the local economic impacts). Benefits during construction, and their legacy (e.g. the Crossrail tunnelling academy), and the relevance to UK-wide industrial strategy could be given more prominence. Again, welcome steps were taken as part of the 2016 update, but more could be done to make this standard practice in advice to decision-makers.

2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

- We suggest that the complex issues that have a long lead time, which potentially includes the additional ones identified above, should form the research priorities over the next 18-24 months. In order to demonstrate progress, and to keep consultees engaged, another consideration should be aiming for a reasonable number of "quick wins", that is, where there is a tangible gap in WebTAG at the moment that could be filled by a short piece of bespoke research. We suggest some of these in our responses below.

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People and Place: capturing the range of impacts relevant to transport policy today

3. What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

- WebTAG is somewhat incomplete in this area, although there are some (relatively little-used) pieces of guidance in active mode appraisal. Transport schemes in the urban realm need to be appraised on a much wider basis than transport schemes in the extra-urban realm (accessibility-based appraisal). Besides the accessibility-based metrics (such as journey time, journey cost, accident cost, noise-air pollution), urban realm schemes need to incorporate benefits, such as location attractiveness for residents and businesses, ambience, personal health impacts and location security. The benefits need to be appraised for a wider group, including travellers and non-travellers (e.g. local population benefiting from public realm improvements). For travellers, beneficiaries need to include users of all impacted transport modes, such as highway, public transport and active modes. The proposed research on location attractiveness (p23) is a welcome part of improving appraisal of urban realm schemes.
- Against this background, on the “people” side, the social value of transport is an important and growing angle. The DfT’s consultation also highlights the work done by Arup and Transport for Quality of Life on the Local Sustainable Transport Fund scheme impacts, which takes discussion of some of these, and other “softer” factors further, by attempting to value the improved access to transport to the long term unemployed (and other societal groups). Arup has carried out some internal research in this area, looking at the total social value of infrastructure, which we can supply under separate cover. We suggest that this is an important area for future work.
- On the “place” side, we suggest that the main areas for improvement are threefold. Firstly, filling in known gaps in the values that are there (for example, to include public squares and spaces, visual amenity, fear of crime, quality generally, amenity benefits at stations, and noise in locations other than homes). Secondly, making sure that the studies used remain relevant to current best practice and public expectations (some date from the early 2000s and previously). And thirdly, providing more detailed guidance on their use, such as providing ranges, case studies, and more indication of the importance of context in how these should be used.

Reflecting uncertainty over the future of travel

4. What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

- In our work alongside ITS Leeds on the Long-Term Benefits of Transport schemes (2016) we suggested accounting for uncertainty through use of a certainty equivalence/cost of risk function. This would apply to the entire appraisal period and could be implemented simply by a

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table in WebTAG. DfT would establish an assumed cost of variability or certainty equivalence using a formula. It would apply to both rail and highway projects.

- We would prefer to see a relatively simple approach, controlled by DfT through its guidance. Essentially DfT will need to consider how the growth fan should be assumed to behave beyond the model period; whether and how capacity considerations and demand/supply interaction effects will apply; other policy considerations such as what future schemes or policy interventions might be relevant, including the growth in autonomous vehicles. All of these considerations would inform the way in which the trajectory of demand and benefits would be extrapolated from the modelled period to the full appraisal period. One possible way of delivering this certainty equivalent risk-adjustment would be to produce a look up table which practitioners would use to move from the model period to the full appraisal period.
- Despite our comments above, the value of journey time will continue to be a critical part of appraisal in the short to medium term. Recent research on VTTS suggest that cost of congestion/crowding could be included in quantitative appraisal where observed data is available to validate the models in term of levels of congestion and crowding. This requires a highly stable and well-converged models and well-defined mathematical relationship between congestion levels/crowding levels and the value of time applied to the specific road section/PT segment. Extending this to travel time reliability benefits is more problematic, mainly due to lack of robust data in support of quantifying them.

5. What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?

- See question 4 above.

Modelling and appraising transformational investments and housing

6. What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

- Investments that could be described as “transformational” are forming a larger part of our work, and of the government’s own spending. Large, controversial schemes such as HS2, Northern Powerhouse Rail and Crossrail are often the public’s, and the media’s primary interaction with the Government’s decision-making framework. As such, it is essential that the appraisal for each of these is carried out correctly, and with the best tools available.
- Despite this, we note that demand models, broadly speaking, are not well-equipped to deal with transformational change, and although the adequacy of these tools is not strictly a WebTAG issue, it is relevant to the appraisal as the magnitude of the benefits is usually proportional to the demand (and any adjustment to WebTAG would be fine-tuning in the face of a tidal-wave of demand-related benefits). We suggest more work on industry-standard demand models, and the use of the certainty equivalence function to account for divergent demand, described above.

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7. What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

- We recommend that transformational impacts are estimated on a short-term and long-term basis (p31). Examples of short-term impacts could be change in property value, change in the business mix of a retail area etc. Long term impacts could include the transformation of land use, development of new/intensified land uses etc. We suggest the use of Land Use Transport Interaction Modelling (LUTI) for the latter.
- We suggest that there are opportunities for research into wider projects that span many government departments. Guidance is needed so that we can avoid double counting costs or benefits, and make sure that others don't fall between the cracks (e.g. training schemes, physical development).
- On housing specifically, further increased coordination with MHCLG is key. Many transport schemes now have a housing component at their heart, and many others have been optimised with housing growth in mind (e.g. Meridian Water station, Oxford – Cambridge rail line and highway). Despite this, there are still some differences in appraisal guidance from MHCLG and DfT. Coordinating guidance across departments will not only be cheaper (one set of research and one set of guidance) but will be unified, and potentially better (MHCLG can learn from DfT and vice versa).
- We also note that there is relatively little guidance in WebTAG on dependent development, and that there are opportunities to build on the informal guidance that TfL has developed in this area.

Supporting the application of WebTAG and making it more user friendly

8. What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

- For the most part, we suggest that the WebTAG guidance is relatively straightforward to follow, although on a practical level, within our organisation, we tend to spread knowledge to more junior staff from existing staff knowledge and make less use of the TAG Unit guidance in training materials. This perhaps suggests that the TAG notes could be made more user-friendly. More worked examples (such as those used in PDFH) could help here.
- Secondly, the TAG sections on wider economic impacts, particularly on labour market impact, and on dependent development are somewhat difficult to understand from the text alone, and for a beginner, can often require consultation with a more seasoned professional (and in some cases with the Department itself). We note that current requests for help or clarification are often made successfully through informal DfT contacts, although a more formal process, such as a helpdesk, could be useful step forward.

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9. What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

We suggest moving WebTAG from a static set of documents to a dynamic, web-based application thus improving flexibility of the guidance (also see answer to Question 9). Guidance could facilitate proportionality by allowing user to choose between options describing modelling or appraisal at various levels, as appropriate to the task.

10. How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

- We suggest moving WebTAG from a static set of documents to a dynamic, web-based application thus improving both accessibility and clarity. Topics would be selected from the main page, and general description of the topics could be placed at the top level, while links in the text could allow for the more detailed exposition of each topic on lower level. Cross referencing could improve clarity by creating the linkages between sections.
- We also recommend developing a short handbook that includes the prescriptive information on modelling and appraisal methodology in a step-by-step format. This manual would not include information on background or theory. Rather, it would aim to provide a quick and easy-to-use document to practitioners who are looking for formulas and the input/out specifications. This document would need to be cross referenced to theory and other detailed descriptions contained.

Developing modelling and appraisal tools that meet user needs

11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

- The appraisal of freight transport within WebTAG is somewhat limited. In particular, the freight value of time which currently considers the driver but not the wider costs and benefits of the value of the goods being transported or direct/indirect business costs associated with delay. A case for change centring on these items could be developed.
- Development of the next generation of modelling/appraisal tools, such as agent-based models (ABM) have been ongoing in the past few decades across the industry. We recommend that DfT takes on board review and research of Agent Based Models.
- See response to question 1 on LUTI models and land value capture.

12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

- We are living in an era where transport data, technology and lifestyles are in flux. We recommend providing an (annual) forum where users can share their modelling and appraisal related innovations. This would be attended by DfT, practitioners, and other stakeholders. The emerging themes, approaches and techniques could be adopted to the WebTAG Guidance subsequently. Potentially, this could include widening out suppliers of transport models.

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13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

- We recommend exploring new techniques in modelling to be able to model emerging new transport trends and technologies. Many of these could substantially alter the value of time, the marginal external costs of transport, and (given the potential for falling transportation costs overall) the public's willingness to pay for improvements. A non-exhaustive list these ideas is below (noting that many of these were included in the original DfT consultation documents):
 - o Mobility as a Service.
 - o Demand-responsive Public Transport.
 - o Electric bikes, scooters, roller blades etc.
 - o Car Sharing.
 - o Connected Vehicles.
 - o Autonomous Vehicles.

Conclusion

Thank you for the invitation to participate in the consultation. We would be happy to elaborate on any of this material in further correspondence or in face to face meetings.

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The Association of Directors of Public Health

Response to DfT Transport appraisal and modelling strategy: informing future investment decisions

The Association of Directors of Public Health (ADPH) is the representative body for Directors of Public Health (DsPH) in the UK. It seeks to improve and protect the health of the population through collating and presenting the views of DsPH; advising on public health policy and legislation at a local, regional, national and international level; facilitating a support network for DsPH; and providing opportunities for DsPH to develop professional practice.

The Association has a rich heritage, its origins dating back 160 years. It is a collaborative organisation working in partnership with others to maximise the voice for public health.

Summary

ADPH welcomes the opportunity to respond to the Department for Transport's [Appraisal and Modelling Strategy: informing future investment decisions](#). DsPH support transport investment which contributes to the health and wellbeing of every community. National government should – in decisions about policy and funding – be taking a Health in all Policies approach – and promoting sustainable transport solutions to reduce congestion, improve air quality and promote physical activity.

Our response focusses on priorities and principles for transport modelling from a public health perspective.

Question 1: Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

- 1.1. We agree the themes outlined in the Appraisal and Modelling guidance reflects the most pressing priorities, although we have some concerns about the balance of these priorities, which we consider in this response. DsPH are especially interested in the 'people and place' theme, which we consider to be the top priority.
- 1.2. Well-connected communities are essential for a healthy society and transport has an integral role to play in this. Improvements to the urban realm, often considered alongside transport schemes, can also generate value – social and economic for communities and this needs to be more fully reflected in the appraisal process.
- 1.3. It is for this reason that promoting active travel is an important area of focus for DsPH. In ADPH's 2016 policy survey, 82% of DsPH said that committing 10% of the local transport budget

to walking and cycling was either in their top five priorities or important to them¹. We would like to see this level of commitment reflected at a national level.

Question 2: What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

- 2.1 Our key consideration would be how to rebalance the way in which the Department for Transport assesses the various benefits of transport investment towards a model which places a higher value on the social and environmental impacts, whilst also maintaining the importance of economic growth.
- 2.2 We think promoting research and investment in active travel is key. However, it is not mentioned once in the Appraisal and Modelling Strategy, which is disappointing. We would like to see this becoming a 'golden thread' running through the Strategy. But, there is also more immediate priorities that can be pursued building on existing evidence (outlined below).

Question 3: What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

- 3.1 Our priorities for improving the appraisal of people and place are focussed on: improving air quality, facilitating active travel and delivering green economic growth.
- 3.2 Firstly, reducing air pollution must be integral to appraisals. Air pollution causes a considerable burden of death and disability and costs the UK economy £20bn every year². Long term exposure to particulate matter has an effect equivalent of 25,000 deaths a year in England by increasing risk of diseases such as heart disease, stroke, respiratory diseases and cancer. The World Health Organisation (WHO) has called air pollution (both indoor and outdoor) 'the biggest environmental risk to health, carrying responsibility for about one in every nine deaths annually'³. Air pollution contributes to thousands of hospital admissions per year and could have long-term impacts on health⁴. One study has shown that air pollution exposure has long-term effects on mortality that persist for decades⁵.
- 3.3 Improvements to air quality can be achieved through making walking, cycling and use of public transport the preferred and most accessible form of mobility. Policies like the adoption of 20mph speed limits where appropriate could have positive effects such as reducing air pollution, noise pollution and road traffic injuries, making it safer for children to engage in more physical activity outside while supporting greater community cohesion and the viability of local businesses.
- 3.4 Secondly, active travel needs to be properly reflected in appraisals. Private car travel remains dominant across the country overall, this is both a cause and effect of how transport modelling and appraisals are designed and implemented. More focus should be given to improving how the overall benefits of cycling are appraised, especially health benefits, so this can be better reflected in investment decisions. To give one example, the London School of Economics and Sky state that accessories, sales, infrastructure, health savings, absenteeism, employment associated with cycling in the UK combined to create a £2.9bn annual contribution to the UK economy

(£230 per cyclist, per year)⁶.

- 3.5 Appraisals should be more coherent, encouraging win-win investment decisions which both benefit the economy and public health. Some of the health costs and implications of transport investment which contributes to, rather than reduces, air pollution has been set out earlier. There are also additional costs associated with a transport system that doesn't sufficiently promote physical activity in terms of absenteeism from work and lack of productivity.

Question 4: What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

- 4.1 We recognise that there is uncertainty in relation to how travel preferences and behaviour may change over time. As the consultation document outlines, over the past 15 years people have been making fewer trips on average and we are yet to fully understand what is causing this trend. A decline in the rate at which young people, especially young men, obtain driving licences is an especially interesting trend with implications for investment decisions.
- 4.2 One important response to uncertainty is leadership. It is critical that there is, at a national level, leadership to promote investment and policies based on the evidence and knowledge we already have – to encourage and shape behaviour in a proactive way (rather than waiting to see where trends go). For example, given the number of young people obtaining driving licences is falling there must be a step-change investment in alternative and sustainable transport provision.
- 4.3 Therefore, even in times of uncertainty, there are opportunities for win-win approaches that view economic growth, environmental sustainability and economic success as complimentary and interconnected, rather than competing or contradictory goals. For instance, the Mayor of London transport strategy aims to achieve economic benefit of nearly £2.2billion through the promotion of active travel⁷.

Question 6: What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

- 6.1 We recognise the importance of the proposed research and creation of a commonly agreed framework to help people build knowledge about how local economies work and consider the impacts of transport investment on those economies.
- 6.2 However, we would like to see an equally curious approach to recognising and further exploring how new housing developments can design-in and promote sustainable transport solutions to achieve health and wellbeing benefits for not just that community but, through the sharing of that good practice, for other new and existing communities.
- 6.3 We need to see a genuine commitment to green infrastructure and new housing developments which encourage walking and cycling. We would like approaches to transport modelling and appraisals that recognise walking and cycling through well-designed infrastructure and creating

networks that enable people to get safely and easily to key points like schools, shops, and healthcare facilities.

**Association of Directors of Public Health
September 2018**

¹ Association of Directors of Public Health, ADPH Policy Survey 2016: Results Report (2016)

<http://www.adph.org.uk/2016/11/adph-policy-survey-2016-results-report/>

² Public Health England, Clean Air Day – taking steps to reduce air pollution, [https://publichealthmatters.blog.gov.uk/2017/06/15/clean-air-day-taking-steps-to-reduce-air-pollution/] (accessed 13 September 2017)

³ World Health Organisation, Ambient air pollution: a global assessment of exposure and burden of disease (2016) <http://apps.who.int/iris/bitstream/handle/10665/250141/9789241511353eng.pdf;jsessionid=0AF61BA7E68B7112AC0B3B7578575D45?sequence=1>

⁴ Defra, Air Pollution in the UK (2015) https://uk-air.defra.gov.uk/assets/documents/annualreport/air_pollution_uk_2015_issue_1.pdf

⁵ A. Hansell et al, 'Historic air pollution exposure and long-term mortality risks in England and Wales: prospective longitudinal cohort study', Thorax, vol. 71, 330-338, 2016

⁶ London School of Economics. The British Cycling Economy. Gross Cycling Product Report. 2011

⁷ Mayor of London, Transport and Health in London (2014)

[file:///C:/Users/benwe/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/TFL%20Transport%20\(1\).pdf](file:///C:/Users/benwe/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/TFL%20Transport%20(1).pdf)

Transport appraisal and modelling strategy: informing future investment decisions – consultation response

This response is a joint response on behalf of Bournemouth Borough Council, Borough of Poole, Dorset County Council, and Dorset Local Enterprise Partnership.

Priorities

1. Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

We would agree that the identified themes reflect a more pressing set of priorities and welcome the inclusion of greater emphasis on travel uncertainty.

2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

In terms of priorities over the first 18-24 months we would strongly encourage a focus on addressing the usability and appropriateness of the tools to the user needs. Specifically, the current user experience is increasingly poor and cumbersome with numerous circular references alongside clunky tables that hinder effective and proportionate application.

People and Place: capturing the range of impacts relevant to transport policy today

3. What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

We would consider the following to be the priorities for improving the appraisal of people and place:

1. Public health and wellbeing,

The need to develop appraisal methods that capture better information on public health and wellbeing impacts of transport schemes is a critical area for any future version of WebTAG. Currently some benefits are included in WebTAG but given the age of the evidence base and the more recent tools developed since the previous update a focus on these pressing societal issues would demonstrate government commitment to providing monetary values in a standardised way that can be used comparatively. We would encourage the review to include best practice examples from across the globe and makes careful consideration to the relative weighting of factors.

2. active modes forecasting,

Current appraisal methods reflect historical policy trends with a strong emphasis on valuing road scheme benefits. Despite a more favourable policy environment for active travel the current WebTAG tools undervalue the wider and direct benefits and consequently encourage a more cautious decision making approach towards proven interventions in lieu of innovative or unconventional active travel measures.

3. person-centric business cases.

Current guidance is deliberately vague on the impact on transport user due to historical limitations of the data available. We would welcome inclusion of additional tools that can provide evidential inference on social and distributional impacts using in particular big data and other digital sources.

Reflecting uncertainty over the future of travel

4. What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

The use of confidence intervals would be a key priority to provide more certainty in treating uncertainty for key variables. We strongly welcome such an approach given the changing situation of key variables such as population forecasts in relation to the impact of Brexit, and the continual alterations made by MHCLG to the underlying methodology.

Given the changes in forecasting at the national level and the (re)emergence of scenario testing within the transport industry we would also strongly encourage this as another priority area. The need to test a variety of futures in place of the predict and provide approach previously favoured would harmonise the disconnect between policy intention and modelling theory. Specifically by being able to test more closely the potential impact of different policy interventions should allow a more robust approach but also enable users to model emerging technologies and innovative interventions.

5. What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?

The technical nature of much of the uncertainty modelling hinders its effective integration into Business Cases.

Modelling and appraising transformational investments and housing

6. What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

7. What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

Supporting the application of WebTAG and making it more user friendly

8. What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

The main barriers relate to the very poor user experience. Whilst the overall page count has been cut it remains far too large and so WebTAG is a lengthy and complicated document to navigate. There are numerous circular references and references to no longer supported documents within it due to its size and infrequent management. The duplication of content with marginally different content for different audiences does not add much value. The lack of clarity over the intended audience for particular sections is another weakness. A root and branch review of the relevance of the documentation, the manner of its presentation and coverage is necessary to overcome this.

9. What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

The biggest fundamental issue with the flexibility is the inconsistent application of the WebTAG criteria by DfT when assessing schemes. In order to risk manage scheme promoters are pushed into fully complying with all WebTAG processes and practices to reduce the possibility of an unsuccessful bid. More transparency in decision making by the DfT should enable a more proportionate application of WebTAG if it is clearer as to which elements are sought and assessed.

10. How can we improve the way in which WebTAG is presented? Why?
We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

Work undertaken by MHCLG to simplify the over 1300 pages of planning guidance across at least 25 documents into a single 65 page document could be a starting point. The accompanying National Planning Practice Guidance online resource is an accessible resource that WebTAG would be well advised to emulate in its simplicity, user friendliness and clarity.

Developing modelling and appraisal tools that meet user needs

11. What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

Accident analysis – we are modelling schemes that improve facilities for walking and cyclists but the COBALT junction types available do not seem to reflect modern junctions (for example) with cycle advances or turbo roundabouts.

Microsimulation modelling – We use Paramics and PEARS for economic analysis, but our promoters try to insist on TUBA. It would be useful to give our promoters confidence in the TAG suitability of microsimulation modelling.

12. How can we best encourage innovation whilst maintaining a consistent and robust approach?

It is not possible to encourage innovation whilst maintaining a consistent and robust approach as scheme promoters will need to deviate from WebTAG in order to explore innovative approaches. The use of a core requirement from WebTAG may be sufficient to alleviate this tension but a trade-off is required between consistency and robustness if more innovation is to be encouraged. A clear stated acceptance that not all elements of innovation can be modelled or monetised will also be required.

13. What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

Officer Response on behalf of Brighton & Hove City Council to DfT Appraisal and Modelling Strategy

Priorities

1 Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

The themes proposed will assist in making the whole process more widely understood, interpreted and valued, **particularly the priority to make WebTAG and appraisal / modelling tools more user friendly.**

2 What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

Consideration of approaches to ensure **regional growth imbalances** are fully reflected as soon as possible, and that different approaches could be taken, for example across different Sub-national Transport Bodies (STBs).

People and Place: capturing the range of impacts relevant to transport policy today

3 What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

- **Health impacts**, including both positive impacts for *new* and *more* walking and cycling due to a scheme, as well as capturing the *negative* health impacts for private motorised travel. The wellbeing of future generations must be built sufficiently into scheme appraisal and health generally should carry further weight than other criteria. Air quality is also an important determinant of health and it should be easier to capture this in appraisal.
- **Value of urban realm** and place-making improvements, including appropriate tools based on evidence from previous schemes and their impacts.
- **Measuring 'journey experience'** will need to change in future, in the context of new and emerging technologies, for example improvements to public transport information, Mobility as a Service, etc, with the potential to make non-car journeys easier and simpler, putting them more on a par with the convenience of travelling by car. Appraisal processes need to ensure future flexibility to account for these changes as these indicators emerge.

Reflecting uncertainty over the future of travel

4 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

- An **evidence-based approach** to fully understanding *future travel needs and provision* is needed in order to accurately reflect this in modelling and appraisal. For example, assumptions that traffic will grow; assumptions on the number of Electric Vehicles (EVs) / Connected and Autonomous Vehicles

(CAVs) within traffic flows, and evidence from cycling and walking schemes to reflect behavioural drivers. New scheme data, once built, should also be reviewed and fed in to future scheme forecasting where appropriate, and case studies, which would then give further confidence in future forecasting work and the appraisal system generally.

- **Impact of reduced driver behaviour** on roads / at junctions due to Connected and Autonomous Vehicles (CAVs) – and the impact of this on traffic flow.
- **Impact of changing demographics** and travel behaviour / influencers.

5 What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?

Challenges and solutions include:

- Ensuring a **robust evidence base** that is regularly updated
- Reflecting the **wider value of sustainable travel schemes** in modelling and appraisal – e.g. full acknowledgement of the impacts of ‘policy-type’ changes both at the local and national level, such as parking restraint, introduction of car clubs, or national policy changes (transport-related or wider policies which impact on travel)
- Challenging the **assumptions of traffic growth**

Modelling and appraising transformational investments and housing

6 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

- Ensure more weight and attention is given to the **strategic case** in these instances.
- Ensure that **cumulative impact can be taken into account** in appraisal (e.g. on a programme basis) rather than just project-specific benefits (as WebTAG is currently structured).

7 What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

Impacts on property prices from a scheme are currently hard to attribute – a way of assessing this alongside wider factors would be useful, particularly in terms of the future **potential for capturing land value uplift from schemes** (a national issue which needs to be suitably addressed).

Supporting the application of WebTAG and making it more user friendly

8 What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

It is imperative to ensure WebTAG is both fit for purpose & robust as well as user friendly. There is a balance to be had here.

Barriers and challenges:

- **Resource** – the current complexity and detail of WebTAG means that, like many other Local Authorities, BHCC require resource from consultants to fully provide support with business case development at all stages. This has a time, resource and monetary cost.
- **Understanding amongst decision-makers** of the appraisal process, in particular WebTAG.

How to overcome:

- Additional training and support from DfT for Local Authority officers on **understanding, interpreting and applying** WebTAG.
- **Simplified guidance** to be produced as an additional document, for different users types and different levels of understanding, as well as video guides for how to utilise WebTAG for example schemes.
- Ensure that decision-makers understand **the need for assessing not just BCR but the wider cases?**
- **Additional resource at sub-national level** to strategically assess schemes and provide expert knowledge in WebTAG.
- The idea mentioned of **summary leaflets** would be welcomed.
- **Case studies** of schemes would be welcomed, showing real scheme application of the tools and guidance.

9 What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

Less reliance on BCR, ensure it is clear that the BCR is not the sole output from the appraisal and that other elements of the wider cases are just as important. Focus on how to interpret and apply the results, with **suitable guidance and tools for a range of knowledge / experience levels**.

10 How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

- Clearly set out the **stages of the process**, actions and responsibilities for different types of user; using **easy to understand methods** such as flow charts.

- **Case studies** and examples of results and their application. **Video guides** on usage of data and tools, with **practical examples** of how and when to apply tools in a given context.
- **Review of existing guidance** and its content / layout – **summary leaflets** welcomed.

Developing modelling and appraisal tools that meet user needs

11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

- Ensure future applicability of these with future data changes e.g. **implications of Big Data**.
- Ensure ease of use for Local Authorities and that while being technically sound the process, inputs and outputs are **understandable to wider stakeholders**.
- Ensure **proportionality** and applicability to **different scales of project**.

12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

See above re proportionality and big data application.

Suggestion that DfT undertake an exercise to **understand the level and type of strategic transport models in place at local level** – e.g. ask the following questions of Local Authorities:

- What model/s are available locally?
- For what purpose were they developed?
- What data sets are feeding into the model/s? and
- When was the model last updated?

This would help to understand, both locally and nationally, different approaches to strategic transport planning, particularly for different purposes / geographical contexts.

13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

- The **use of and implications of Big Data** – great potential for collecting data without causing traffic in itself (e.g. mobile network data as opposed to roadside surveys).
- The **need for more robust data** generally and more Origin-Destination data.
- Consideration of **how to capture transient populations and visitor economies** in the modelling / appraisal process? This would help to understand particular local issues in more detail.

DfT consultation on transport appraisal and modelling strategy ~ submission from Campaign for Better Transport

October 2018

Campaign for Better Transport is a leading charity and environmental campaign group that promotes sustainable transport policies. Our vision is a country where communities have affordable transport that improves quality of life and protects the environment.

We welcome the opportunity to respond to this consultation on transport appraisal and modelling strategy.

Summary

We welcome the review of transport appraisal and modelling strategy. While acknowledging that the WebTAG tool is widely regarded as a world leader, we nevertheless welcome the potential to improve it further. It is reasonable to judge the value of an appraisal tool not only on its internal logic and theoretical robustness but also on what kind of infrastructure it delivers on the ground. Current appraisal is failing to deliver the integrated local transport that is needed for sustainable growth and a secure low carbon future.

We are concerned that the current over emphasis on the economic case for schemes, underlined by assumptions on demand and value that reinforce traditional assumptions rather than evolving needs, risks undermining schemes for which the strategic case, and the ability to deliver key policy priorities, is strong.

By ensuring that the widest range of impacts and opportunities from transport investment are taken into account, redressing the historic imbalance in valuing road transport over other modes, properly costing the environmental impacts of climate change, and supporting positive trends in the way people live, work and travel, a reformed WebTAG will enable better transport investment and better travel choices in future.

Our approach

We welcome the review of transport appraisal and modelling strategy. While acknowledging that the WebTAG tool is widely regarded as a world leader, we nevertheless welcome the potential to improve it further. It is reasonable to judge the value of an appraisal tool not only on its internal logic and theoretical robustness but also on what kind of infrastructure it delivers on the ground.

A level playing field for sustainable transport

We are concerned that the current over emphasis on the economic case for schemes, underlined by assumptions on demand and value that reinforce traditional assumptions rather than evolving needs, risks undermining schemes for which the strategic case, and the ability to deliver key policy priorities, is strong.

This is particularly seen in assessing new rail links which are generally undervalued, while new roads are overvalued. We are concerned that this inhibits the ability of decision makers to live up to the aspirations set in the Government's policies to cut transport emissions, locate homes near transport hubs, promote rail freight, and boost walking and cycling. If health objectives were valued in appraisal, we would see much greater weighting for active travel and far less on car-based transport.

Traditional transport appraisal has consistently underestimated the economic benefits of bus services, walking and cycling provision and overstated the value of small scale savings in road travel time, leading to an imbalance in favour of unsustainable road building. Yet the DfT's own figures show that spending on cycling offers far better benefit-to-cost ratios than road building schemes and the review of the Local Sustainable Transport Fund found that packages of small local schemes focused on sustainable transport delivered excellent BCR of 5:1. This echoes the findings of research published by Campaign for Better

Transport on the effectiveness of the LSTF projects in connecting people to work and boosting the local economy.

The experience of the Local Sustainable Transport Fund (DfT: Impact of the Local Sustainable Transport Fund, summary report 2017) is that by funding good quality local transport, promoting modal shift and actively engaging in travel demand management programmes, it is possible to change travel behaviour so as to cut traffic, tackle congestion, and maximise efficient use of the network. Projects reduced car use and successfully promoted bus use, cycling and walking, and demonstrated excellent value for money. We would like to see much greater value given to such proven scheme types in future appraisal.

Highways England's report on long-term planning sees greater use of buses and public transport only as part of a 'diminished prosperity' scenario. This is both offensive and misguided. Modern buses are an integral part of vibrant, prosperous cities that achieve sustainable growth while managing congestion.

Traditional appraisal also undervalues investment in rail freight over road freight, despite the great potential for rail freight to deliver benefits in terms of reducing congestion, pollution and wear and tear on the road network. Research for CBT previously shared with the DfT found that HGVs only pay around a third of their congestion and external costs. There is a need to calculate and consider all the external cost of HGV use, as demonstrated by the DfT mode shift benefit table, and to review the current passenger car value (pcu) given which is too low for HGVs in many circumstances.

Appraisal models should better reflect the strong benefit-cost ratios for freight enhancements, typically in the range of 4:1 to 8:1, as highlighted in the latest Network Rail Route Strategic Plan. Targeted rail freight upgrades work; for example, the gauge upgrades out of Southampton Port increased rail's market share from 29 to 36 per cent within a year and had a benefit-cost ratio of five to one. This should be factored into investment planning.

Better understanding of environmental impacts and benefits

POPE studies show that schemes that increase road capacity have increased traffic, adding to environmental degradation of the countryside and increased pollution in the urban areas which already have the most congestion, and bring little or no economic benefit. An appraisal tool that can justify new roads undermining the protected status of National Parks for the sake of a few minutes of motorist time saving is clearly flawed.

Transport is the one sector of the UK economy where CO2 emissions continue to grow. In light of the critical threat of climate change, any appraisal of infrastructure must seek to contribute to reducing greenhouse gas emissions. The current appraisal methods are failing to deliver the integrated local transport that is needed for sustainable growth and a secure low carbon future.

We are concerned that the real costs of climate change are not sufficiently reflected in current appraisal, and believe strategies such as the NPPF and the RIS should be subject to Strategic Environmental Assessment. This approach should also inform the appraisal of individual schemes.

Our report Roads and the Environment (2018), produced with support from the Rees Jeffreys Road Fund, addressed concerns that traditional scheme appraisal values the minimising of adverse environmental impacts but does not sufficiently look at the positive value of green infrastructure. It looked at the potential for mechanisms such as whole life costing, natural capital accounting and resource rental to better capture the value of green infrastructure in scheme appraisal and so enhance the roads environment for the benefit of users and for the wider community.

Reflecting and shaping changes in travel demand and behaviour

We recognise the uncertainty around future trends, reflected in the wide range of traffic growth forecast scenarios recently published by DfT, but also that there is an opportunity to harness the positive trends and focus investment to support them. Planning for future transport infrastructure should not only reflect demand – "predict and provide" – but also seek to deliver the best scenarios for a sustainable future, by shaping demand – "decide and provide".

A key trend is identified in the work of the Commission on Travel Demand, which shows that travel demand is changing hugely, with fewer shopping and commuting trips, and lower car use by younger people.

Technology is changing not only how people access travel but the use made of travel time. This should change the current dependence on travel time savings as a primary tool in appraisal and allow appraisal to focus on the quality of the journey and its wider costs and benefits for society instead.

Using data to map the impacts of such behaviour change on transport infrastructure demand would lead in turn to much more appropriate and less costly investment. Two case studies commissioned during the RIS2 evidence phase (and shared with the DfT in our RIS2 evidence submission) demonstrate the benefits of this approach:

- 1) Research by consultants MTRU, commissioned by Campaign for Better Transport and sponsored by the Department, has explored the potential for using rail freight to reduce road congestion. It found that upgrading strategic rail corridors parallel to the SRN could significantly reduce HGV volumes on the A14, A34 and M6 corridors. Upgrading existing rail lines, which run parallel to the motorway routes and are currently nearing full capacity, would allow large numbers of loads to be transferred to rail. Transferring 2000 lorry loads a day to rail would be the equivalent of taking 8000 cars off the road and would bring serious additional benefits including improved road safety and reduced air pollution and carbon emissions. The DfT welcomed the study, noting that “rail freight offers real benefits for the environment and helps keep bulky loads off of the road network, helping to ease congestion for other motorists.”
- 2) Researchers at the University of Northampton pooled anonymised postcode data and travel survey responses from public sector employees to identify which routes have the greatest volume of single occupancy car commuting. Their study focused on mapping journeys on the A45 trunk road through Northamptonshire. Having excluded HGVs, LGVs, bus and coaches, the team identified flows of 102,000 cars a day on this road, and have postcode data on origin and destinations of 39 per cent of these journeys of which around 80per cent were single occupancy trips. Car sharing could remove 14,500 of these vehicles, and there are opportunities to use the data to enhance bus provision on key routes. Around 4 per cent of the overall commuting demographic is making journeys under 2 miles: switching 80 per cent of these to bike would remove another 4300 vehicles. A modest investment in these other travel options could remove around 20per cent of the traffic currently on the trunk road, with benefits not only for congestion but also for the environment, with reduced carbon emissions.

We would like to see the benefits in traffic reduction from modal shift of both passenger and freight traffic away from road transport given greater weight in future transport appraisal.

Joining up transport and land use planning

We welcome the work done to better reflect the added value that transport investment brings to places, both in terms of land value capture and of understanding the wider regeneration benefits. Increasingly, transport investments are not standalone projects but are designed to open up sites for new homes and jobs.

Transport appraisal should reflect the priorities of national and local planning policies that seek to locate these homes and jobs close to transport hubs and should support policies that direct development to appropriate locations.

Such an approach would give less value to building new homes close to motorways, or high-speed dual carriageway roads and place greater value on development on sites within walking distance of major public transport links, and adjacent to or within urban centres. This would follow the best practice set out in our publication, the Master-planning Checklist for Sustainable Transport in New Developments.

We would also commend allowing greater flexibility to meet different local area needs, particularly in the many areas seeking to accommodate rapid population growth, and around highly congested corridors between sensitive sites or in dense urban areas. A more open approach to option development and appraisal would keep new road building as a last resort, while allowing constructive engagement with stakeholders to seek more sustainable alternatives. For example, it should not be acceptable to say that because no bus or rail improvements are planned at present, therefore a new road is the only solution.

We would like to see a positive value in appraisal for developments that follow the sustainable transport hierarchy: reduce demand, widen travel choice, maximise efficiency, and make new capacity a last resort.

A methodology that reflects real world needs

We are encouraged by the range of factors that are being taken into account in WebTAG revisions and the modelling for RIS2, including demographic change, the reduction in number of trips, and the impact of spatial planning decisions on travel demand, and by the development of multi-modal regional traffic models.

We commend to DfT the survey research into how practitioners find the transport business case process carried out with our support by Paul Beckford under Prof Peter Jones and Dr Tom Cohen at UCL. (The findings have been presented to the DfT TASM team). This found that while the intellectual robustness of WebTAG was respected, it was not always sufficiently flexible to accommodate the needs and priorities of transport planners, operators and the communities they serve.

Responses showed that increasingly, transport projects are trying to solve multiple policy problems simultaneously such as boosting economic growth, reducing environmental impact, reducing congestion, improving network capacity, reducing journey times and opening up land for development for housing. Consequently, there is a significant need for greater cohesion amongst different policy areas, particularly between transport, planning, land-use and housing.

The Beckford study also found that whilst respondents were broadly satisfied with the five-case approach in theory, there was consistent criticism that in practice, the WebTAG model seems to focus too heavily on economics (especially value for money) and the transport impacts of schemes. A particular frustration of many respondents was the dominance of the time-savings metric within WebTAG, which inevitably favours long-distance schemes over shorter ones. We urge that this should be rebalanced to ensure that all schemes are competing on a level playing field.

By ensuring that the widest range of impacts and opportunities from transport investment are taken into account, redressing the historic imbalance in valuing road transport over other modes, properly costing the environmental impacts of climate change, and supporting positive trends in the way people live, work and travel, a reformed WebTAG will enable better transport investment and better travel choices in future.

This approach frames our response to the specific consultation questions set out below.

Priorities	
1) Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?	We agree that these are the priority themes.
2) What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?	<p>We would like to see the People and Place theme properly assess the critical impact of CO2 emissions, the health impacts of different travel choices, and also look at valuing natural capital.</p> <p>The work on uncertainty should embrace new and different certainties from falling travel demand, potential for technology to deliver behaviour change and the impacts of the significant changes required to cut CO2. Technology is changing not only how people access travel but the use made of travel time. This should change the current dependence on travel time savings as a primary tool in appraisal.</p> <p>The work on transformational developments should look at reflecting the value delivered by centring development around transport links, and the benefits of agglomeration in existing urban centres.</p>

People and Place: capturing the range of impacts relevant to transport policy today

3) What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.	<ul style="list-style-type: none"> Costing CO2 impacts and the ability of transport investments to meet CO2 reduction targets Costing air pollution and health impacts and the ability of different transport investments to help meet Government targets in these areas Better valuing the natural environment both in terms of protected landscapes and the potential for green infrastructure
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Reflecting uncertainty over the future of travel

4) What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.	<ul style="list-style-type: none"> Apply forecast scenarios sensibly to deliver a 'best guess' approach based on actual travel behaviour Use data to value investments that reflect changes in travel demand towards more sustainable modes Value investments that deliver critical targets on CO2 reduction, where there is great certainty of the need for change
5) What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?	<ul style="list-style-type: none"> We should not be passive in the face of uncertainty but understand that infrastructure decisions not only reflect but shape demand A clear policy framework combined with a 'best guess' scenario-based approach will enable sensible choices despite some inevitable uncertainty We also have some hard certainties, especially around CO2 emissions, which should set this framework.

Modelling and appraising transformational investments and housing

6) What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.	<ul style="list-style-type: none"> Capturing the added value delivered by centring development around existing transport links Better understanding of the benefits of agglomeration in existing urban centres Valuing quality of development as well as location in terms of the transport choices supported by new housing developments
7) What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?	<p>Campaign for Better Transport is not a user of WebTAG although we observe its impacts.</p> <p>Currently transport appraisal for new developments appears to be driven by quantity of homes and jobs unlocked rather than the quality of place created.</p> <p>Incorporating the sustainable transport hierarchy into appraisal of transformational schemes could assist in capturing the value of quality as well as quantity of development.</p>

Supporting the application of WebTAG and making it more user friendly

8) What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?	<p>We commend to DfT the survey research into how practitioners find the transport business case process carried out with our support by Paul Beckford under Prof Peter Jones and Dr Tom Cohen at UCL. The findings have</p>
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	been presented to the DfT TASM team). This found that the WebTAG model seems to focus too heavily on economics (especially value for money) and the transport impacts of schemes. A particular frustration of many respondents was the dominance of the time-savings metric within WebTAG, which inevitably favours long-distance schemes over shorter ones. We urge that this should be rebalanced to ensure that all schemes are competing on a level playing field.
9) What more could be done to articulate the flexibilities in WebTAG and support scheme promoters to apply the guidance?	WebTAG should reflect and accommodate devolution of both overall strategy and individual scheme development to local authorities who know best what suits their areas.
10) How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.	We echo the views of LG TAG that making necessary changes to WebTAG should not result in making it more complex.
Developing modelling and appraisal tools that meet user needs	
11) What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.	Our primary concern is that whatever method is used has the best real world impacts, in particular in giving appropriate value to low carbon, local and sustainable transport investment.
12) How can we best encourage innovation whilst maintaining a consistent and robust approach?	Allowing more flexibility on a devolved basis, perhaps with a pilot scheme or pathfinder approach, could allow different areas to demonstrate innovation within a high level strategic framework.
13) What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?	We commend the approach set out in our report Roads and the Environment (2018) produced with support from the Rees Jeffreys Road Fund: this looked at the potential for mechanisms such as whole life costing, natural capital accounting and resource rental to better capture the value of green infrastructure in scheme appraisal and so enhance the roads environment for the benefit of users and for the wider community.

October 2018
Bridget Fox
Campaign for Better Transport

Campaign for Better Transport's vision is a country where communities have affordable transport that improves quality of life and protects the environment. Achieving our vision requires substantial changes to UK transport policy which we aim to achieve by providing well-researched, practical solutions that gain support from both decision-makers and the public.

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Submission by the Chartered Institute of Logistics and Transport (CILT)

to the Department for Transport Consultation:

Transport appraisal and modelling strategy: informing future investment decisions

Questions 1 and 2 - Priorities for the next 18-24 months

The themes set out in the Department's Consultation Paper are all relevant and of importance in ensuring the quality and appropriateness of the Department's appraisal methods. The Strategy is more focused on methods than on the practice of appraisal, where more consideration might usefully be given to the process of option generation. In the past the range of options considered for a scheme has tended to be restricted to options which are designed to generate the same level of output, in terms of traffic or passenger flows. There is a case for including in the list of options considered alternatives which differ in their specification to reflect better the uncertainty about future flows and the set of options which perform best under a wide range of possible futures.

The considerations that should inform the scope and priorities for the Strategy are twofold – priorities should be those themes which are most relevant to government policy objectives and those research areas which are likely to have a reasonable chance of success. A further consideration is the role of other government departments, where research projects which are shared with OGDs may well deliver cost effective returns.

Question 3 - People and Place

The Department has recently issued updated advice on valuing improvements in reliability for road and rail users. However, evidence on the supply side, detailing how investment in better management of infrastructure and increased capacity has the potential to reduce the variability in day to day journey times, is still limited to variability caused by incidents¹. As many CILT members are aware, incidents are not the only cause of unreliability. A better understanding of the factors that cause variations in door to door journey times and of the policies that would reduce such variations is likely to bring significant benefits to transport users.

The research commissioned by the Department into valuing time savings and changes in reliability did not extend to assessing the benefits to the freight and distribution sector of such improvements. The CILT believes that the cost savings approach to valuing time

savings to business and industry, which has now, in the case of briefcase travellers, been superseded with a behavioural based value, should also be reviewed in the case of freight operations. Although this is a complex and difficult topic, the CILT is of the view that better evidence on the benefits to the freight and logistics sector of investment in infrastructure and in traffic management would help to strengthen the business case for such investment. The CILT proposes that the Department should commission a scoping study to establish the feasibility of conducting a more extensive assessment of benefits to freight and logistics operations of improvements in journey times and reliability¹.

Valuing changes in urban realm is important because policies to increase the attractiveness of cities support objectives for sustainable living and managing the growth in the number of households. While, as the consultation suggests, LUTI models might be one way of putting a value on changes in accessibility and the related environmental and other quality changes to a neighbourhood, alternative approaches based on stated and revealed preference methods might also be appropriate. The Department should work with MHCLG and other government departments in taking forward this research.

There is a good case for research into valuing the time spent in driving in congested conditions. In rail appraisal time savings when investment in capacity allows people to travel in less crowded conditions are valued at a premium on uncrowded time savings and hence strengthen the business case. Similar considerations should apply to road travellers and investment decisions on highway schemes. However, the research would need to note that the values of time currently used are for savings on a typical journey and so will generally include some element of congestion.

Questions 4 and 5 - Reflecting uncertainty over the future of travel

Recent DfT research has helped to identify a number of causes of changes in travel demand, such as the change in the behaviour of young men², demonstrating that the past has not invariably been a good guide to the future. The Consultation notes a number of approaches to uncertainty being taken forward to assist decision makers. As noted above in the response to questions 1 and 2, there is less discussion in the Strategy about the role of uncertainty in the choice of options and the allocation of a given budget. At present the assessment of uncertainty is largely used to demonstrate whether a project is likely to deliver acceptable value for money under a range of future scenarios. There is no attempt to establish whether a different programme, perhaps with a greater number of smaller schemes, might not be a preferred choice set if growth was to be lower than the central assumption, and whether catering for down side risk might not be a more prudent outcome than taking the central estimate as the yardstick for the business case. And the question

¹ Please note that CILT's Freight and Logistics Policy Group has launched a study addressing the value of freight and is also assisting the National Infrastructure Commission with its work in this area.

about whether the uncertainty about future policy options, including scenarios for land use planning and the pricing of transport services, is not addressed.

Revised guidance on optimism bias and learning from the experience of cost overruns are both welcome initiatives. However, it is not clear that the Department puts sufficient resources into challenging project costs by applying comparable investigation techniques as are applied to the appraisal and modelling of the scheme through the DfT's analytical assurance framework. While analysts and modellers lack the expertise to challenge cost estimates, there is a strong case for ensuring within the design and engineering team a comparable challenge function and demonstrating the effectiveness of such an initiative.

Questions 6 and 7 - Modelling and appraising transformational schemes

Several different supplementary models have been used to estimate the level 3 wider economic impacts of a range of transformational projects over the past few years and the contribution of such schemes to GDP. Each of these varies in the theoretical framework on which the model is based, on the responses to transport cost changes included in the model, in the strength of those responses and on the evidence to support the model. Because these models are all owned by the consultants who have developed them, there is some lack of transparency about the strengths and weaknesses of each model. While these models are set up to inform spatial policies, there is little to suggest that other government departments responsible for spatial policy have made use of such models despite their responsibility for providing much of the data that underpins these supplementary economic models. There is a strong case for greater cooperation between government departments and between government, academics and the consultants who have developed these models. The aim would be to provide a better and shared understanding of the strengths and weaknesses of spatial economic models and of their data requirements with the objective of providing analysts with an appreciation how such models might help to inform policy decisions, such as those concerned with the role of transport in rebalancing the economy between regions. The Department's proposal, set out in section 8.13 of the Consultation Document, should be a useful first step in this direction.

There is a strong case for research into improving the evidence base on valuing the impact of new housing or of more intensive housing developments as a direct consequence of investing in increased transport capacity. Such research might take account of the second round impacts of the relocation of households on publicly provided facilities such as schools and health services in both the exporting and importing locations.

The Consultation proposes further research into the productivity benefits of transport investment, in particular the impacts of inter-urban schemes which tend to lead to decentralisation of economic activity in some circumstances. Any research proposal will need to be based on a robust behavioural foundation, following the approach set by the theoretical underpinnings for the modelling of positive economic externalities from

agglomeration which resulted in the Department's guidance on Wider Economic Impacts and Productivity.

Questions 8-10 - Supporting the application of WebTAG and making it more user friendly

The Department's initiative in holding stakeholder events at which practitioners and other experts have the opportunity to interact with the WebTAG team is to be welcomed and the decision to hold events outside London demonstrates the importance the Department attaches to this commitment. The Department might consider whether there is a demand for such events to be held on a regular basis so as build on the relationship with WebTAG users established during the consultation period. The proposal in the Consultation to provide as part of WebTAG case studies and worked example will help users in developing business cases. The Department should avoid the temptation of providing as examples only those which result in demonstrating the achievement of 'high' value for money.

Questions 11-13 - Developing modelling and appraisal tools that meet user needs

A more holistic recognition of uncertainty, both in the generation of options within a package as well as in establishing the robustness of the business case for a specific option, is a key priority for modelling and appraisal methods. Such an approach might help to answer those who have criticised the direction of investment policy on the grounds that the future is unlikely to be a continuation of the past because future changes in technology will have a different impact from past changes and because of changes in behaviour following a long period of stability. As noted above, one approach to recognising uncertainty would be to assess its impact at a programme level.

The Department's commitment to learning from well conducted evaluations of transport schemes, as set out in the report 'Strengthening the Links Between Appraisal and Evaluation'³ is to be welcomed. The extension of the evaluation methods from a simple comparison of forecast and outturn traffic flows and other impacts to an understanding of the causes of differences or similarities as recommended in that research report has the potential to provide a more comprehensive validation of the transport models which form the foundations of the business case.

Submitted by:
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October 2018

¹ <https://www.gov.uk/government/publications/cobalt-software-and-user-manuals>

² <https://www.gov.uk/government/publications/young-peoples-travel-whats-changed-and-why>

³ <https://www.gov.uk/government/publications/strengthening-the-links-between-appraisal-and-evaluation>

**Appraisal and Modelling Strategy
Consultation 2018
Individual Submission – Christopher Gillham
Winchester SO23**

1. General

- 1.1. Yet another meaningless consultation designed to get spurious authority for what you do already. The Department for Transport is the major anti-environmental force in this country and will be the primary driver of our failure to meet climate change commitments. Our landscapes are ruined by the DfT, our air is poisoned by it, our economy is diverted into unsustainable practice and our health and wellbeing is compromised by the lifestyles it has promoted. The lack of alternatives (e.g. the government assault on rural bus services and increasingly on the railway system) and the movement of economic activity away from town and village centres to car-dependent locations has socially excluded those who through poverty, age or disability cannot access even basic facilities.
- 1.2. I have made submissions on transport appraisal on several occasions, all with the usual result – that the DfT ignores everything I say. If the points I have made were contestable then the proper response of the DfT would be to contest them. It has never done this, presumably because it has no answers to my points or that what I say is somehow outside the comprehension of those who have built an elaborate appraisal structure on assumptions that they cannot bring themselves to question.
- 1.3. There is no point in attempting to rephrase the arguments for minds that are closed to fundamental questioning. In the unlikely event that there is someone at the end of this consultation process who is prepared to think about fundamentals, I attach both my submission to the Transport Select Committee in 2013 and my response to the Major Road Network consultation earlier this year. The latter details my vain attempts to get answers from the DfT via my local MP.
- 1.4. Essentially road transport appraisal in the UK is built on a grotesque circularity of argument. It starts with the **unproven** assumption that road transport must be beneficial to the overall economy at any level and on the principle that saving costs for the activity must make it more beneficial, it proceeds to build up supposed cost savings into a sum that it regards as a proof that road transport must be beneficial to the overall economy. Within this absurd circularity it posits a principle of '*Willingness to Pay*' as the Adam Smithian '*Invisible Hand*' that drives the economic mechanism.
- 1.5. Yet '*Willingness to Pay*' supposes that the user of road transport is the one that pays the price. Yet all the evidence is that the road user is highly subsidised. Even within this consultation there is a grudging admission that there are externalities. But the extent of them is of course ignored. The Blueprint 5 analysis of true costs some 22 years ago computed the true costs of road transport at three times the total tax and duty paid by the user¹. Since then the true costs of just air pollution have proved comparable to the difference between road taxation and road expenditure. All other externalities thus signify massive subsidy to motorists and road freight operators. And the climate costs of road transport hardly figured in Blueprint at all; yet now we would regard them as gigantic.

2. Questions

- 2.1. **Questions 1/2: Themes and Scope.** The wording of these themes has some recognition that previous thinking might not apply to the real future, but there is very little in them to suggest that DfT is capable of real analysis of transport needs in a future that should be informed by concerns for climate stability, environmental sustainability or even the emerging modern economics. The primary theme should be to review the whole basis of the previous appraisal 'methodology' in terms of fundamentals. DfT should (FOR THE VERY FIRST TIME) do some research on true costs of road (and air) transport and whether or not the *Great Car Economy* is a complete and

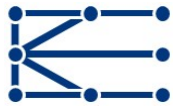
¹ The DfT have never countered this analysis.

dangerous illusion. It would be nice to think that DfT were really going to investigate the relationship between housing planning and transport. There has certainly been a woeful tendency to plan communities around assumptions of ever-growing car transport, rather than around integrated transport thinking.

- 2.2. The reference to *'Recent guidance has taken big steps forward in capturing many of these impacts but we need to build on this to support the ambitions of DfT's Transport Investment Strategy, for example, understanding transport's impact on housing growth along a corridor and a consideration of productivity benefits beyond those generated by agglomeration effects'* suggest that the DfT is in its same old same old frame of mind. Having never demonstrated that its *'Investment Strategy'* produces *'productivity benefits'* its attempt to claim they are even greater than its already absurd agglomeration assumptions, is just another sinister step in the great confidence trick it continues to play.
- 2.3. The last two themes are merely a statement that the DfT is going to carry on with its whole pseudo-economic framework of appraisal.
- 2.4. **Question 3:** The People and Place discussion seems to make valid comments on the externalities of transport – on pollution, health etc., but then creeps back into the usual guff about value of travel time, as if David Metz had not shown this nonsense up for what it was years ago. And now talk of valuing the *customer's* experience.
- 2.5. What matters here is what the burdens are that DfT road-building obsession has placed on the health and well-being of people, their living spaces and their environment. If DfT just once started to look with a self-critical eye at what it has been doing for the last 50 years then there might be some chance of progress towards a civilised transport policy. A triumph of hope over experience I fear.
- 2.6. **Question 4. Futures.** It is good to see amongst the fantasy stuff on autonomous vehicles, some notice being taken of the change of transport habits in the country – with younger people not subscribing to the Jeremy Clarkson model that the DfT has of the ordinary 'rational' person. It is of course noteworthy that the DfT's traffic forecasting takes no real notice of this trend as it adds the latest spine to the famous porcupine graph – forever predicting massive growth of traffic and building the roads to encourage it to happen
- 2.7. **Why not try and imagine a future where transport is taken as something that should be shared and efficient?** Why not think about how the country could function with efficient public transport that all could benefit from instead of the subsidised motoring public? Why not think about healthy, slower alternatives, where quality of life mattered more than imagined time savings?
- 2.8. **All Other Questions: Uncertainties and Modelling.** Here the DfT goes again. Magical pseudo-science (Monte Carlo calculations for Heavens sake! – such gobbledygook probably fools the politicians but cannot make sense to reasonable people) apparently will deal with uncertainty.
- 2.9. DfT economic modelling has been baseless from its beginning. Complexity is no measure of soundness. To just piggy back one piece of complexity after another onto no real foundation and believe that what you've got has meaning is self-delusion. Until you throw away all the Webtag nonsense and look at the fundamentals, this sort of thing is merely piling Ossa of obstinacy on Pelion of stupidity.

Yours faithfully

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Connected Economics

competitiveness, spatial economics, development, infrastructure

Appraisal and modelling strategy: Informing future Investment Decisions

Joint Consultation Response

Cebr and Connected Economics Ltd

15th October 2018

Cebr

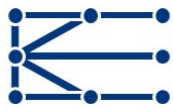


Table 1: Revision history


Version	Date	Prepared by	
		Initials	Signature
1.01	24/08/2018	DAW	
2.01	09/10/2018	IEJB	
3.01	11/10/2018	IEJB	
4.01	15/10/2018	DAW	

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1. Preamble

Connected Economics and the Centre for Economics and Business Research (Cebr) welcome the opportunity to contribute to this consultation. DfT has a long record of developing and expanding the evidence base that underpins WebTAG. This has enabled UK transport appraisal practice to co-evolve with the state of knowledge and understanding of the impacts of transport investment and its interaction with other policy areas. This consultation represents the latest stage in this process; we expect it to play an important role in further improving the quality and coverage of WebTAG, which continues to be regarded as the leading model of open documentation transport appraisal guidance in the world.

Transport investment is increasingly seen as a means of addressing policy objectives related to the UK's productivity and competitiveness challenges. Conventional methods for appraising transport schemes (in which user benefits are taken as a reasonable proxy for the overall economic impacts) were designed with more limited purposes in mind and are not well suited to this broader task. In particular, they treat as fixed the very patterns of economic activity that such policies are seeking to influence.

The update and restructuring of WebTAG's Wider Impacts guidance in 2014 represented a major step forward in addressing this challenge. Scheme promoters are now expected to conduct context specific appraisal that responds to the anticipated impacts of the proposed investment. This has enabled the DfT to open the door to consideration of a more dynamic set of impacts in certain circumstances. These impacts are more remote from the scheme's direct beneficiaries than those captured in conventional appraisal and considerable challenges remain in relation to understanding their full range and extent, the complementary factors that are necessary to unlock them and how to model them robustly.

Furthermore we have entered a period of significant change in many of the fundamental relationships that influence the role of transport in society and the economy and our understanding of these is still developing. For example, many of the radical changes in communications, globalisation, business structure and returns to skills are not yet well understood. Appraisal tends to rely on easy to measure metrics, such as those based on historic journey patterns, and pay comparatively little attention to less easy to measure factors that may nevertheless be important, such as how a combination of future changes in transport technology and lifestyles may change transport behaviour.

At the same time, changes in institutions and policy have altered the role of the DfT. Alongside growing interest in the wider consequences of transport interventions, DfT is more often operating as a partner to other agencies or departments, such as LEPs or MHCLG, for example through the Housing Infrastructure Fund, Growing Places Fund, or through City Deals. This kind of cooperation is to be welcomed, but it lays bare tensions between appraisal methodologies in different policy areas. It also highlights a need for strategic leadership and coordination between policy areas and at different levels of government to ensure high quality, good value schemes and programmes of appropriate ambition and scope are brought forward.

In responding to this consultation, we have tried to look ahead at the needs of appraisal in years to come. We have not been afraid to raise issues which lie somewhat on the fringes of this consultation, but which will have an important bearing on how we develop, model and appraise the transport and other interventions of the future.

We focus in our response on:

- Whether the themes reflect the most pressing problems;
- People and Place;
- Dealing with uncertainty; and
- Transformational investments.

2. Themes

Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

In our view the themes set out do generally represent the most pressing priorities for the development of appraisal and modelling guidance. However, there are three issues that we consider are not adequately covered in the themes set out in this consultation.

- ➔ Integration with appraisal in other agencies;
- ➔ Fiscal feedbacks from investments; and
- ➔ Visioning and strategic promotion of transport projects;

Integration with appraisal in other agencies

The aims of transport policy are widening and DfT is increasingly being called on to examine impacts in spheres that have typically been the preserve of other government departments or of local areas, such as housing, health, regional development and regeneration. While this is described in the 'changing appraisal environment' part of the consultation document, some aspects of this merit their consideration of their own.

First, Transport has a wide range of impacts and influences. In many cases, it is an enabling factor in a wider policy mix. A key question is whether DfT should be attempting to develop guidance in other areas or whether it should be looking to other departments to do this.

In our work, we find that there are important differences in the way that appraisal is undertaken in other departments. One critical difference is in the treatment of additionality and displacement between WebTAG Wider Impacts and in MHCLG guidance. The default assumption in WebTAG is that no Wider Impacts related to development or employment are additional at a national level. MHCLG Guidance, by contrast, uses different levels of additionality from "low" (25% or less) to "medium to high" (50% to 100%). To some extent, MHCLG guidance is dealing with directly correcting imperfections in the property development market where additionality would not be expected to be zero. However, it also recognises demand side factors by presenting the level of additionality as contingent on the economic cycle. We therefore believe there is some mutual incompatibility between the two approaches to be resolved.

Another key difference is in the valuation of equity impacts in WebTAG and in MHCLG guidance. MHCLG guidance¹ specifically adjusts willingness to pay to take account of the marginal utility of income for different groups using welfare weights. By contrast, WebTAG uses a policy value of time which is intended to avoid different values of time for different income groups. However, where projects generate significant impacts on the welfare of third parties (which are not captured in values of time), these impacts are not subject to any welfare weighting. This creates an inconsistency within

¹ See Annex G of the DCLG Appraisal Guide

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/576427/161129_Appraisal_Guidance.pdf

WebTAG for such ‘joint’ transport and economic development projects and an inconsistency with projects appraised using DCLG appraisal guidance. As the WebTAG approach modifies the ‘true’ valuation people place on time savings it will provide a less reliable guide to the uplift in property values that a transport scheme may generate when considering funding options, e.g. land value capture mechanisms. This also highlights the fact that the final distributional impacts of schemes may be very different from that which the initial incidence of benefits suggests with property owners capturing a significant proportion of the benefits.

In the context of increasing multi-disciplinary appraisal, we consider it important that DfT works with other agencies to identify these kinds of differences in assumptions and resolve them as far as possible. A key question will be whose budget is (and should be) being considered in cross departmental appraisal.

Fiscal feedbacks from investment

The outcomes of government interventions can broadly be thought of in three types:

- ➔ Productivity impacts that affect business’ bottom line;
- ➔ Welfare effects that may not affect productivity such as leisure time savings or changes in the amenity value of the built environment; and
- ➔ Distributional effects such as social security expenditures.

Transport investment, more than most other forms of government activity, deliver the former. If transport is truly to be considered as an ‘investment’, then it should be considered in terms of how it returns value over time. To the extent that it unlocks economic growth, the tax consequences should be considered a legitimate aspect of additional benefit for appraisal purposes. (Clearly they are dependent on the extent of additionality).

Some other agencies and local governments have been thinking in these terms. In the development of City Deals, for example, some local areas have made a local contribution to infrastructure and are aiming to deliver economic growth which will, in turn, grow their business tax base. In the context of localised business rates, this provides a financial mechanism for local areas to make a return on their transport investments.

Visioning and strategic promotion of transport projects

We think that further consideration could usefully be given to the broader process for translating diverse policy objectives into schemes – and whether more explicit recognition is needed of the importance of *strategic vision* in the overall process. After all, there is little practical purpose in the UK having world leading transport appraisal and modelling capability if there are failings in the broader approach within which it is applied that prevent the UK developing a world leading transport *system*, i.e. one that enables its economic and social potential to be fully realised in a sustainable way.

In this regard we welcome the emergence of an independent strategic body for setting the direction of UK infrastructure decision making, in the form of the National Infrastructure Commission. We are nevertheless concerned that there appears to be a gap at the strategic scheme / programme sponsorship level, i.e. there is an absence of institutional responsibility for coordinating differing policy requirements and ensuring they are translated into decision making about the scope and ambition of

major projects and investment programmes. We set out below some examples of what we regard as significant missed opportunities with major schemes currently in development:

- ➔ An opportunity to design the Crossrail 2 station at Euston St Pancras in a way that provides a high quality interchange between Euston and King's Cross / St Pancras main line stations has been missed. This would enable high quality interchange between HS1 and HS2 and also between Euston and Thameslink. Since, however, the detailed scheme design is being undertaken by TfL on behalf of the Mayor (with DfT interpreting its strategic sponsorship role in a way that precludes an active role in scheme design) there is no mechanism for incorporating supplementary objectives that reflect the interests of stakeholders outside London, e.g. regional cities interested in improved rail links to the Continent, locations in S.E and East of England on Thameslink that would benefit from improved access to HS2 etc;
- ➔ One of the stated objectives of Crossrail 2 is to provide sufficient capacity on London's transport system to support the additional passengers expected at Euston, following the completion of HS2 Phase 2b in 2033. A major strategic benefit of HS2 is that it unlocks capacity on the network for improved commuter services on the lines into Euston, King's Cross and St Pancras, opening up housing options for London workers to the north. It can therefore play an important role in relieving the housing affordability constraint that threatens the future growth of London's economy and in particular its global city function. As currently planned however, the Crossrail 2 route north of Euston St Pancras is primarily focussed on unlocking housing in its own corridor (mainly in the Upper Lea Valley). The line only links HS2 to London's major employment centres in one direction, i.e. southwards to the West End; by taking a more southerly route to the east of Euston and serving a station at Old Street rather than Angel, it could further leverage the benefits of HS2. Again, however, there has been a lack of the deep collaboration between Crossrail 2 and HS2 that could have enabled such potential improvements to be properly explored;
- ➔ In general Crossrail has been planned in a way that enables its benefits to be transmitted through much of London's transport system, particularly in central and East London, where there are high quality interchanges at many stations. This reflects the alignment of interests brought together under the Mayor's integrated transport and planning aegis. In west London, significant benefits have not however been realised in the planning of the Old Oak interchange, where Crossrail intersects with HS2. In particular, an opportunity to provide a high quality interchange between Crossrail / HS2 and London Overground was not pursued on grounds of cost. It is not clear however that this was weighed against a proper view of the potential strategic benefits. Such an interchange would have provided very significant benefits for passengers travelling between Heathrow Airport and a wide range of inner London locations such as West Hampstead, Clapham Junction, Shepherd's Bush. Emissions from surface access trips are a major issue in Heathrow Airport's expansion plans but there was no mechanism for this consideration to be incorporated in TfL's decision making process in relation to the capability of the Old Oak interchange;
- ➔ No dedicated high speed link to Liverpool is planned as part of HS2 phase 2b which means the city region will be put at a competitive disadvantage until an east – west link is provided as part of NPR. The cost of providing a dedicated high speed rail station in Liverpool city centre

is one of the factors that has determined this decision. It should however be possible to avoid this cost through a solution in which HS2 and NPR provision is coordinated with one of the key schemes set out in the LCR Long Term Rail Strategy to improve the city region's urban transport system (and which would complement HS2 and NPR). HS2 trains would be divided at a Crewe hub before returning to HS2 for the final leg into Liverpool. HS2 / NPR services could then be accommodated at Liverpool Lime Street using freed up capacity created by diverting local services from Lime Street into Liverpool Central via a disused tunnel under the city centre (i.e. integrating them into the Merseyrail Northern Line). An interchange between local and long distance services would be provided at Edge Hill and this would bring forward the need for capacity expansion at Liverpool Central, also planned in the LCR Long Tem Rail Strategy. This represents a tailored, cost effective solution for the Liverpool City Region, giving it a much improved urban transport system as well as the full connectivity benefits of HS2, without having to provide expensive and unnecessary station capacity for full length HS2 trains. It is however clear that no national level organisation currently takes responsibility for in depth analysis of opportunities arising from coordination of strategic planning at different levels and for sponsoring any improved scheme options that arise from it.

We think there is a useful role in appraisal in addressing this issue. The Strategic Case requires evidence on alignment with wider government objectives, although the examples given above suggest this process is haphazard. We believe consideration should therefore be given to requiring scheme promoters to demonstrate that genuine and broad ranging consideration has been given to identifying supplementary benefits. The Australian State of Victoria's framework for creating and capturing value merits investigation as a possible model for the UK.

<https://www.parliament.vic.gov.au/images/stories/committees/paec/2017-18 Budget Estimates/presentations/MP - Victorias Value Creation and Capture Framework.pdf>

3. People and place

What should be our priorities for the appraisal of people and place and why? Please select up to three areas.

Valuing place attractiveness

In conventional cost – benefit appraisal, transport is treated as a derived demand that is dependent on the activities engaged in at the destination. As such, it depends on the attractiveness of the destination and the cost of travelling to it. Place specific factors such as environmental conditions, the quality of urban realm, and the availability and quality of employment, leisure, and retail opportunities will influence ‘place attractiveness’. It is usually assumed however that the attractiveness of the destination is independent of the transport scheme under consideration, and therefore that the aggregate change in the generalised cost of travel associated with the scheme represents a good approximation of its total benefit.

In more recent years it has been recognised that, while this approach works for many smaller schemes, it is sometimes an incomplete view and that in certain circumstances a transport scheme can in fact influence the attractiveness of the destination. In current guidance, changes in the attractiveness of a place are either captured through amenity values ascribed to the quality of the environment, or to productivity effects through agglomeration, i.e. external benefits derived from the observation that the productivity of employment is correlated with city size and that transport improvements increase access to economic mass and therefore effective city size. There is also a dynamic effect whereby location decisions by individuals and firms will respond to changes in the attractiveness of places, which means the attractiveness of both origins and destinations is relevant to transport demand, at least in the longer run.

In recent decades, most of the UK’s major cities have seen an urban renaissance. The causes of this are debated but are likely to include a shift towards knowledge based and service sector activities² which favour dense environments, growth in cultural output from cities, and increasing wealth leading people to desire more variety, which is available in cities.

The agglomeration effect captured in guidance, however, only affects businesses through improved access to other businesses. This misses an important part of the “buzz” that surrounds dense urban environments. Transport plays a key role in connecting people to varied cultural and consumption opportunities.

There is some research evidence³ to support the notion that people place increasing value on access to a wide range of services. However, understanding of the impacts of density on individual or household utility functions, for example through the role played by access to greater consumer choice, or greater leisure and cultural opportunities is currently poor.

² See “The Flat White Economy: How the Digital Economy is Transforming London and Other Cities of the Future”, Douglas McWilliams, 2015.

³ For example, Glaeser, E., & Gottlieb, J. (2006). Urban Resurgence and the Consumer City. *Urban Studies*, 43(8), 1275-1299

For example, as the number of residents in a place grows, opportunities for sharing the cost of certain services with high fixed costs – both public and private – increase, so the quality of such services can be expected to increase with location size. An analogue of this is that it is easier to cater to a wider range of preferences and tastes in larger places, leading to a greater range and diversity of leisure and cultural opportunities. In terms of public services, it is clear that denser, more populous locations can support better public transport provision and infrastructure for active travel.

Given the nature of the factors that are important in determining the attractiveness of different locations, it is clear that there are likely to be significant market failures. This implies that an appraisal approach that fails to incorporate adequately the benefits of transport induced land use change is unlikely to be a reliable guide to the deployment of resources if we are interested in maximising the *economic potential* of places. This is relevant to questions such as the relative benefits of reusing brownfield land in cities for compact development versus extensive, low density development on green field land but also to the regional rebalancing agenda.

More broadly, in our view a lack of deep collaboration between actors in different policy areas can result in sub-optimal outcomes. There are also likely to be feedback mechanisms between place and people effects. For example, housing development in most parts of the country has for many decades created car dependent, low density neighbourhoods with few local services, and built with cheap materials and to poor design standards. This in turn has worked to create particular habits and expectations about lifestyles. The reasons are unclear and may be due to the complex interactions between the structure of the development industry, and various aspects of the planning process.

In our view, significantly better outcomes could be realised by more integrated planning – supported by a more complete approach to the appraisal of the impacts. Key to this is a recognition that planning the transport system should be coordinated with other interventions aimed at improving the attractiveness of places – and interventions to help people to respond to new economic opportunities.

There is a role for DfT to make a contribution in this area by examining whether a concept of “residential agglomeration economies” could be operationalised within transport appraisal. This could go a long way to capturing the impacts of transport on places using robust valuation techniques.

Regional rebalancing

There is an increasing focus on regional policy with the aim of closing a long standing productivity gap between London and the south east and other regions of the UK. In one view this is a redistribution question that arises from a political / moral imperative to make society fairer. It may also be helpful to see this as an appraisal challenge that demands a more dynamic view to be taken in identifying how various types of interventions can work in combination to unlock latent economic potential. The task is then to identify and correct market failures that are responsible for certain regions not fully adjusting to historic structural shifts in the UK’s international competitiveness. This is predicated on the existence of significant opportunities that can only be realised through planning and coordinating major, long term investment to address key themes and a realignment in economic geography.

For example, the Northern Powerhouse Independent Economic Review has identified a need to address both relatively low economic participation rates and low worker productivity, which contribute roughly equally to the overall gap in output per capita. It set out a number of ‘people’ and

‘place’ related reasons for the existence of this gap and recognises the interaction over time between these people and place factors. A particular issue facing many former industrial areas is a legacy of land uses focused on achieving strong single industry localisation economies. This means that many areas, often containing sizeable settlements, have historically had poor connectivity, and are therefore less economically integrated with neighbouring areas than would be expected on the basis of their geographic proximity. This has limited access to employment opportunities for residents and the resulting chronic economic dislocation has led to a wide variety of social challenges that represent considerable challenges in themselves.

It is recognised that investment in skills and infrastructure – including improved transport capacity and connectivity - within a framework of integrated spatial and economic policy making is needed to address these issues, and should lead to a more consistently competitive and inclusive economy in the North. It is not however clear that a sufficiently full understanding of the factors influencing place attractiveness (and the investment coordination failures that they are subject to) is available to inform the design of these investment programmes, together with their appraisal. For example, there are significant challenges in relation to housing quality that may limit the ability of some places to respond in the absence of radical regeneration and redevelopment programmes. At the same time, locations with rich industrial heritage are often well placed to attract economic activity, particularly in newer industrial sectors. Many of these are associated with an urban lifestyle in which the quality of experience is important in attracting high skilled workers. This phenomenon has been described in ‘the Flat White Economy’.⁴ See also the box below on London’s experience over the past 30 years, which shows how various inherent ‘place’ factors can generate economic potential that requires coordinated investment to unlock it. Greater latent economic potential may exist in cities such as Liverpool with strong heritage and cultural sectors, as well as relatively plentiful affordable housing (an important factor in the emergence of the ‘Flat White Economy’) than current analytical approaches are able to demonstrate.

The implication is that there is a danger that an appraisal system that values a certain kind of analytical robustness over completeness results in an insufficiently dynamic view of the economic potential of people and places and may therefore act to limit the flow of resources that could otherwise be valuably deployed to unlock latent economic potential. In other words, there is a need for the system to support a more visionary approach to long term investment in order to transform economic outcomes in places suffering from the effects of severe and chronic market failure.

⁴ See “The Flat White Economy: How the Digital Economy is Transforming London and Other Cities of the Future”, Douglas McWilliams, 2015

Focus on place attractiveness factors in London's changing economic geography

A series of large, comprehensively planned mixed use developments have been built in London over the past 25 years, forming a necklace of new business and residential nodes around the edge of the central area. These developments have been characterised by integrated, carefully phased investment with a strong focus on 'place making', backed up by deep partnership working between the public and private sectors. This approach has succeeded in establishing high quality, attractive new city quarters in locations that had been previously regarded as highly peripheral, both to commercial and residential property markets. According to the GLA's London Office Policy Review 2017 these 'mega' schemes...

"...have allowed the physical capacity of London's economy to grow rapidly and help maintain the capital's critically important Global City role. At the same time they have changed the spatial structure of business: the historic duality of the tightly defined City and West End markets has broken down and companies are far more footloose than they ever were."

The notion that companies involved in activities that define London's Global City role are now far more footloose needs to be carefully qualified. It is certainly the case that they are willing to consider locating in areas beyond the traditional 'prestige' office market locations of the West End and the City but this does not mean locational factors are no longer important to them – rather the factors they consider important have evolved.

Shifting locational preferences are partly a reflection of changes in the nature of commercial floor space requirements. The early 'mega schemes', notably Canary Wharf, were built to meet increasing demand for space in large floor plate buildings resulting from the globalisation of the high value traded service activities that London traditionally specialised in. Restrictive planning policies meant few opportunities existed for these types of buildings in the heart of the West End and City. In contrast, a few miles to the east lay an area with few such restrictions and hundreds of acres of developable land resulting from the demise of London's docks in the 1960s and 1970s. During the 1980s the London Docklands Development Corporation thus spearheaded a new approach to urban development involving the 'recycling' of spare land resulting from earlier structural economic changes and putting it to new, high value uses capable of meeting the emerging demands of London's renewed global economic role.

More recently the central London economy has diversified. Financial services have become less prominent since the 2008 crisis while professional services have grown strongly along with clusters in the creative, technology and life sciences sectors. This has been accompanied by an evolution towards more 'lifestyle' oriented locations which are able to offer workers the more exciting and vibrant urban environments they seek. These combine a richer mixture of land uses and offer diverse spaces for residential, leisure, cultural and educational uses as well as offices and other commercial activities. The epitome of this phenomenon is the new urban quarter emerging on the former railway lands behind King's Cross station which has been 'curated' to provide a carefully balanced diversity and mix of uses. It unlocks value through exploiting the heritage value of the stations – which was unavailable while railway stations were perceived to be dirty, noisy and unpleasant locations.

4. Reflecting uncertainty

What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why?

Uncertainty arises from many sources, including:

- a. The assumptions made about what a model will capture;
- b. Our exogenous view of the world in the future;
- c. Changes in behaviour in the future which would change these parameters;
- d. Statistical uncertainty over behavioural parameters and uncertainty over their transferability and how they are implemented;
- e. Uncertainty over valuation methods.

In our view, current appraisal substantially underestimates the uncertainties associated with (a) to (c) above. Appraisal practitioners tend to focus uncertainty analysis on (d) and (e), once a model has been created. This is a mistake and causes substantial uncertainty to be overlooked. We therefore recommend that the understanding and treatment of uncertainty in appraisal should focus more on areas (a) to (c).

In a fast changing economic and social environment, some critical factors are lifestyle changes associated with technology and urbanisation – driven by long term technology changes and increases in the returns from service sector jobs.

We need a better understanding of the behaviour of different groups and cohorts in society and the trends of the future. We also need a better understanding of how different factors (e.g. economic growth, social change, behavioural change, etc.) have led to incorrect forecasts in the past. This harks back to a theme of Understanding and Valuing the Impacts of Transport Investment – the link between appraisal and evaluation. This has made some progress but evaluation evidence could provide so much more, particularly in understanding sources of risks to forecasts. There is an interesting contrast between the approach taken in the 2018 National Road Traffic Forecasts, which are based around a range of scenarios, and the reluctance to use scenario planning as part of the scheme appraisal process (except in the case of HS2, where sensitivities to the main input variables were tested).

The single most important thing that DfT could do would be to change its guidance around TEMPRO. By providing a single set of economic forecasts through TEMPRO, DfT sets a poor example for capturing uncertainty and this affects behaviour throughout the industry. In our view DfT should take the lead in creating a range of forecasts for use in scenario planning. Interventions should be appraised to be robust to a wide range of states of the world.

Recent debates about ‘peak car’ and changing patterns of trip making demonstrate the paucity of a single forecast approach to growth, social and behavioural change. While enabling a simple comparison between projects, TEMPRO’s insistence on a single view of the future allows no room for these debates. The history of road traffic forecasts in particular has been poor, and a scenario based approach will go a long way to overcoming these perceived weaknesses in appraisal practice.

The second most significant improvement that could be made in this area is to recognise that transport interventions are not ‘one shot’ decisions. Rather, they can be managed in future depending on how the state of the world develops. DfT’s single forecast approach does not value options which cater for subsequent expansion or for managed reductions in levels of service if demand does not materialise. For example, if demand for a multi-storey car park is uncertain, current appraisal practice will not recognise the value of building strong foundations which would enable it to be expanded in future with extra levels, or of building it so that parts could easily be repurposed if demand was lower than anticipated. Appraisal under different assumptions about the future would enable the value of these future flexibilities to be captured.

Third, DfT could support quantitative assessment of historic projects to see where the forecasts were wrong and how this was related to the different levels of uncertainty described above.

5. Modelling and appraising transformational investments and housing

We consider the theme of “Modelling and appraising transformational investments and housing” to be unhelpfully characterised. First, it is not at all clear what is meant by ‘transformational impacts’. If these are impacts on the use of other resources (such as by promoting physical development), why should be concerned with ‘transformational’ impacts on these outcomes rather than ‘marginal’ impacts which may also affect the business case? Second, it privileges housing over other kinds of development, or mixed use development. While we understand the current policy sensitivity associated with the broken housing market, surely other impacts on resource use such as employment or placemaking to support quality of life are equally important? This theme would be better restated as something like ‘Modelling and appraising how transport investments can change how and where we use resources.’

What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

We highlight three priorities:

- ➔ Developing the microeconomic foundations of existing supplementary models;
- ➔ Validation of supplementary models; and
- ➔ Developing guidance on using scenarios to reflect linkages between transport and development.

Improved microeconomic foundations in existing modelling approaches

Through our work we have seen the coevolution of the economy, the transport system and the physical environment. This has delivered different sizes and kinds of workspace to support different kinds of economic activity. Work hubs and live-work spaces are now common.

In some of our northern cities, single industry ‘monoculture’ economies have been swept aside by structural changes. Some of these areas are already economically dense, but transport alone will not raise their economic performance, although it may be part of the policy mix. By contrast, other cities are booming, and not just in the South East. Where there is density and economic diversity, there is flexibility to make the most of new opportunities, to make use of the advantages of economic density and to benefit from economic growth. In these areas, transport is often a constraint simply through capacity constraints, but also in widening already large markets to build on their existing advantages.

Transport, as part of the policy mix, can have a significant effect on the spatial development of the UK and contribute to economic policy and regional policy. It is time for DfT to thoroughly explore robust approaches which expand transport models to capture, and appraise, spatial outcomes.

The most robust and sustainable way to do this is to ensure that models are adequately grounded in microeconomic theory. In practice this means that personal choices should stem from defined utility functions and business decisions should stem from defined production functions. The ‘marginal revolution’ in economics has seen improvements to the foundations of many areas of economics, but

models of transport interactions with the economy have fallen some way behind this aspiration. It would be a big leap from current practice, but to crack this challenge, we need a rethink of our spatial models. The key questions are:

- How can choice sets be expanded to adequately capture transport and spatial behaviour?
- How can production functions adequately capture different features such as internal economies of scale, agglomeration, skills and economic diversity and the interrelations between them?
- How can models be effectively parameterised?
- How can they be validated?
- How can the various sources of data be better exploited?

While ambitious, it is time for a fresh exploration of these approaches. Experience from recent projects, such as analysis of Highway's England's Second Road Investment Strategy, suggests that technical feasibility is best tested through small pilot studies with limited objectives rather than by adapting already large and complex models.

Validation of supplementary models

While we acknowledge progress through the DfT's efforts to strengthen the links between appraisal and evaluation, supplementary economic modelling approaches need a programme of validation. Many existing models are widely used and have seen many years of painstaking work to include in them representations of additional sectors, groups, or economic processes. However, few have any real validation efforts including, for example, David Simmonds' LUTI model, Steers' Urban Dynamic Model, and Spatially Computable General Equilibrium Models.

These models often have applications for many clients. The cost of a serious validation exercise would be substantial for an individual client, but the value across all clients would be considerable. Perhaps DfT could act as the champion of a multi-client studies in this regard?

Development of guidance on using scenarios to reflect linkages between transport and development

We welcome the new WebTAG Unit A2.2. However, it maintains the assumption that transport and development are planned separately and that the link is entirely about the capacity of the local network to fit new traffic from the development.

In our experience, transport interventions can be linked to or affect development in two main ways.

- *Uncoordinated:* A transport intervention can have widespread but diffuse impacts. These can change the attractiveness of different areas as places to live or to do business. They can also change the competitive dynamics between different areas in ways that are best captured through formal land use transport interaction models or similar.
- *Coordinated:* In some cases, a transport project is an integral part of a larger investment where there is significant coordination between transport scheme promoters and planners or property developers, for example through masterplanning. In this case, it is not appropriate to assume that either the transport or the property development would happen in isolation,

or to model these using a LUTI model which implicitly assumes that the different actors are responding in an uncoordinated ways to the actions of the others.

We recommend that guidance also considers the possibility of mutually linked transport and physical development, for example through contractual agreements or through a single land owner/developer/masterplanner. Through this kind of approach, transport and development would be considered as a single project (similar to the approaches now being taken for some HIF bids). This would be best undertaken jointly with MHCLG.

What transformational impacts do you currently find it difficult to represent in appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

In our view the concept of additionality is redundant when considering transformational change, partly because it inherently assumes that the economy is operating at some kind of efficient equilibrium but also because there is likely to be a very much greater degree of uncertainty to deal with.

The economy is not a set of simple rules, but a complex set of agents with different preferences and technologies seeking mutually advantageous exchanges in a changing environment. Some agents (e.g. businesses or land owners) can have very large impacts on local outcomes. This is why abstract macroeconomic modelling fails at small scales where the actions of single companies or developers can radically change outcomes. Instead, these issues need to be dealt with through bespoke analysis which reflect the individual actors and local circumstances. This implies that there is no clear or consistent set of factors that are prerequisites for transport to have a ‘transformative’ effect. It is highly context specific and searching for a generic formula is likely to prove fruitless. Equally a ‘commonly agreed framework to help build knowledge about how local economies work’ is likely to prove unproductive – at least at smaller spatial scales where many transport and physical development outcomes occur. That is not to say that building an evidence base will not help, but there will remain a large degree of uncertainty. With case studies, there is substantial opportunity for findings not to be generalizable.

In our view a more relevant approach is risk analysis. The purpose of this is to (a) identify as complete a set as possible of significant risks and (b) assess them. A big element of this is to assess where the future could be different from the past and how much needs to change for the future to pay back an investment. A sense of the scale of change, and the plausibility of the changes that are under consideration is valuable in assessing both feasibility and risk. We would welcome scope within appraisal to explore transformative changes through this lens instead of through simple forecasts and additionality assumptions.

Appraisal and Modelling Strategy Consultation

Response by Dr David Metz, honorary professor, Centre for Transport Studies, University College London.

Q3

There is a major gap in the evidence of the impact of road investments. Highways England's post-opening project evaluations monitor traffic volumes, flow rates and journey time reliability. However, there appears to be no study of how the travel behaviour of individuals change in respect of trip origins and destinations, journey purpose, distance and travel time. Such data could be collected using travel diary techniques on a representative panel. (For rail investments, ticket sales data go a long way to providing relevant data.)

The finding of the National Travel Survey that average travel time has hardly changed over 45 years implies that there are no travel time savings in the long run. Time savings that arise on the opening of an improvement are subsequently used to make longer trips, the user benefit being increased access to desired destinations, opportunities and choices, which lead to changes in land use and value. To understand the impacts of transport investments, we need evidence of actual outcomes, as opposed to the outputs of transport models in which land use is constrained to be unchanged.

Surveys and qualitative research indicate what most concerns people about traffic congestion is the unreliability of journey time, which is more important than reduced speed. Digital navigation devices, such as Waze and Google Maps, provide estimated journey times at the outset of a trip, taking account of likely congestion on the recommended route, thus reducing experienced unreliability. Another example bearing on reliability is real time information about when the bus is arriving, available at bus stops and on smartphone apps. We need to take account of the potential of digital technologies when considering public investment aimed at improving journey reliability.

Q4

When making forecasts, it would be helpful to make a clearer distinction between factors affecting individual travel behaviour (per capita effects) and the impact of population growth. There are many uncertainties about factors that could affect future travel behaviour – economic, behavioural and technological – many of which are open to policy influence. The National Travel Survey finds that average per capita travel behaviour by all modes (except international aviation) has remained fairly stable over the past 20 years, suggesting that the impact of future uncertainties may not be as great as is often supposed.

On the other hand, there is more uncertainty about population effects: births/deaths, migration and location of net increase. Importantly, the pattern of future transport demand will reflect the balance between house building on greenfield sites and new dwellings within existing urban area. The National Trip End Model needs to be made more transparent in order that the impact of population uncertainties can be explored.

Q6

Transformational impacts can occur at any scale. A proposed bypass around a small town could make land accessible for new housing that developers might wish to build and that planners might see as a means of meeting housing targets. Such a development could be on a scale that would be transformative for the locality, and for which transport and housing investments should be appraised for their combined impact.

The benefits of new housing made possible by a transport investment should be treated as an integral element of the economic benefits. It is not a question of improving confidence in estimates of land value uplift before incorporating into estimated of BCR. The need is to avoid double counting which can be achieved by an evidence-based approach – evidence of the actual behavioural response to an investment (see Q1 above) – since people can do only one thing at a time. If they take the benefit as time savings, they are not travelling further for access to more distant destinations, and vice-versa.

Government departments have different approaches to investment appraisal, all consistent with the Green Book. The estimated benefits of public investment should not depend on the methodology used for appraisal. A unified cross-departmental approach would be desirable.

An impediment to a unified approach arises from the simplifying assumption of the fixed trip matrix, made at the outset of development of transport economics as a distinct sub-discipline. Although this constraint was subsequently relaxed, the dominance of time savings as the user benefit remains, despite lack of empirical evidence. With hindsight, a better simplifying assumption would have been to hold average travel time constant, consistent with the NTS findings, so that user benefits would be improved access, and models would necessarily allow for changes in land use.

Given where we are, it would be desirable to consider how application of the distinct sub-discipline of spatial economics might illuminate the relationship between transport, land use and land value. The Department might usefully commission a scoping study from economists with relevant expertise.

Q8, 9

The Department is in effect the regulator of public investment in the transport system. Regulatory approaches vary along an axis from broad principles to

detailed requirements. WebTAG is at the extremity of detail, far more so, for instance, than the MHCLG appraisal guidance.

It would be worth the Department considering moving to a more principles based approach. This would reduce the present volume and complexity of WebTAG, and would allow users greater flexibility, but would require a means of oversight to ensure compliance. Possible oversight mechanisms include peer review, as for academic journal papers and competitive grant applications; and an independent regulator. The ORR is a regulator whose scope might be enlarged to cover publicly funded transport investments generally.

Q11

Given the ubiquity of traffic congestion, it would be desirable to develop models that allow possible interventions to be explored. The general situation is that congestion arises in or near areas of high population density and high car ownership. There are more car trips that might be made than are actually made, given the capacity of the road network. Potential trips are deterred by the prospect of unacceptable time delays and travellers make alternative choices – a different mode, time or destination, or not to travel at all. Congestion is therefore self-limiting, but for the same reason not easy to mitigate. Traffic models that incorporate such decisions by road users would help illuminate policy options and investments.

The Department's aviation model needs to be developed to generate a range of scenarios, as for the road traffic forecast. The question of market maturity needs more consideration.

Given the failure of existing rail forecasting models to anticipate the post-privatisation doubling of passenger numbers or to forecast the recent cessation of growth, and given also the substantial investment in railways underway and planned, reliance on the industry's proprietary model seems unsatisfactory. The Department might discuss with the ORR the development of a transparent model of rail demand. Rail operators could be required to provide data to calibrate a model as a condition of a franchise.

Q13

LUTI and SCGE modelling in principle can help understand the relationship between transport investment and land use change. However, such models are complex and opaque, being generally proprietary. The Department might consider making available some seed corn funds to see if there is appetite for the development of an open source model that takes advantage of crowd sourced digital data.

There is a need to address relative priorities for investment to support transformational change across a range of aspects – skills, place, property development, utilities, as well as transport, both inter- and intra-urban. A key question is how public investment can leverage private investment. High level

broad brush analysis that assessed relative cost-effectiveness would be desirable to support a strategic case and to help devolved authorities reach decisions about priorities and investment portfolios.

9 October 2018.

**Department for Transport consultation:
Appraisal and Modelling Strategy: Informing Future Investment Decisions**

DSC response to consultation

October 2018

version 2

1 INTRODUCTION

- 1.01 This note has been prepared by David Simmonds Consultancy (DSC) in response to the DfT consultation on *Appraisal and Modelling Strategy: Informing Future Investment Decisions* initiated in June 2018. It reflects thinking prompted by attendance at several of the DfT-organized workshops as well as experience from project work. It focusses on the issues that have been and are most important in DSC's work – and most important to the firm's clients - on modelling the interactions between transport, land-use and the economy and in appraising public sector interventions while taking account of these interactions.
- 1.02 The note is organised as follows. The following three sections summarise our views on how the Department should develop
- appraisal and the modelling to support that appraisal;
 - further research to support modelling and appraisal;
 - the use of modelling and appraisal methods.
- 1.03 Section 5 summarises key points from this discussion as responses to a number of the questions from Annex A of the consultation document.
- 1.04 We appreciate that as one of the small number of consultancy groups specialising in modelling land-use/transport/economy interactions, and one that has invested in the development of original methods for such analysis, we will rightly be seen as having an interest in encouraging further use of such methods. That is inevitable in the present situation. Naturally, some of the developments that we would commend relate to methods that we have developed. However, we have tried to avoid getting into any details that would amount to recommending our own methods over competitors'; and we believe that all of the methods and approaches we recommend are at least contestable markets if not already the subject of keen competition.
- 1.05 We are happy for this note to be published if the Department wishes to do so. We may publish it, in this or modified form, ourselves.

2 APPRAISAL AND ITS BASIS IN MODELLING

- 2.01 Modelling and appraisal should be developed and recommended in WebTAG and related work so as to help local authorities and others with methods to use in formulating plans and proposals. This would contrast with the present situation where the guidance tends to be very specific to the requirements for securing the Secretary of State's approval and/or funding, and hence tend to define a set of barriers to be overcome once local authorities and other parties have decided on their preferred interventions.
- 2.02 One of the problems to be addressed in this area is that preferred alternatives or designs are often developed on the basis of more limited analysis (partial Level 1 analysis in current WebTAG terminology), with the wider case or "transformational" effects only being properly considered later. This may well mean that the design (e.g. a railway route and station locations) adopted are not the best for wider economic and land-use effects which may in the end be more important. Rather than WebTAG providing guidance solely from the point of view of the Secretary of State's ultimate decision-making, more emphasis should be placed on the role of WebTAG has providing guidance for good appraisal practice in general, including more emphasis on how local authorities can use WebTAG methods to estimate the costs and benefits of a scheme or policy at local level (as argued in TIEP), as well as at national level.
- 2.03 Part of this wider basis for using WebTAG methods should be to improve the linkage between the strategic and economic cases. More attention should be given to ensuring that the objectives of the strategic case can be valued. A conspicuous case of inconsistency is where part of the strategic case is "rebalancing the economy", which often turns out to be at odds with the economic case assumptions around maximising welfare and more specifically with current assessments of wider economic impacts. Methods and valuations should be developed to measure, and if necessary to put "shadow prices" on, identifiable regeneration benefits. This should also address the risk that the "narrative" around the expected economic impacts may get into "cherry-picking", for example by ignoring regeneration disbenefits (reinforcing the prosperity of already prosperous areas) in cases where these do not help the case for the scheme being tested.
- 2.04 We have reservations about the term "transformational scheme". The consultation document itself rightly makes the point that "transport schemes alone are unlikely to have transformational impacts unless parts of a carefully targeted packaged of different policy interventions" [para 6.19]. "Transformational schemes" should be recognized as integrated land-use/transport planning, not just as transport schemes with particular kinds of consequences; and the appraisal should be in terms which can be related to both land-use and transport planning objectives. More specifically, appraisal should be in terms of who gains and loses how much from the package of policies, in what ways, after tracing through indirect consequences – so neither time savings nor land value increases are satisfactory measures. This is important for making appraisal meaningful to non-specialists - simply arguing that people **may** turn time savings into more and better housing is not satisfactory. For example, if the strategic objective is to supply housing, the appraisal should centre on the benefits to residents of the additional housing, not on proxy measures which

might under some conditions relate to housing. Appraisal in more meaningful terms will help, along with demonstrating the wider applicability of WebTAG methods (2.01 above), to make appraisal more relevant.

- 2.05 What follows from tracing indirect consequences is better consideration of unintended side effects particularly through externalities. This is a key feature of David Metz's long-standing criticisms of appraisal based on time-savings (if not the point he himself has laboured most: that if time savings from a road improvement are converted into longer journeys, the externalities (e.g. air pollution, noise, severance) might be quite different from if drivers just made the same journeys in less congested conditions; and they will be different again if some of the time savings are further converted into land-use changes.
- 2.06 As a component of this tracing of consequences, it should be recognized that the effects currently identified as "wider economic impacts" are models in themselves, and that treating them purely as effects that can be considered simply in post-modelling appraisal may miss potentially significant consequences. The same goes for other consequences of transport change e.g. improvement in the quality of the urban environment will have impacts on residential (and possibly business) location and cannot be assumed simply to accrue to "existing" residents.
- 2.07 The assumption that only very large schemes such as Crossrail2 or Northern Powerhouse Rail are "transformational" needs to be challenged. Smaller schemes may have locally "transformational" effects through interactions with land-use planning policies – there are for example numerous examples of bypasses built at a distance around the bypassed settlement whose alignment was decided so as to enclose an area for housing development which dramatically expanded the settlement in question. Such schemes would count as fairly small road schemes, and arguments for "proportionate appraisal" might be taken as implying that their wider impacts should not be considered. However, such schemes collectively add up to major schemes, and ways should be found to estimate "typical" economic impacts if it is impractical to model these impacts for the scheme itself. This would help to prevent policies with negative impacts from being (perhaps inadvertently) adopted piecemeal when more thorough analysis would make a case against them.

3 FURTHER RESEARCH AND OTHER EVIDENCE

Calibration

- 3.01 DfT should encourage and support more research using econometric methods to examine empirically the impact of transport change on land-use and economic activity/performance over time, at spatially detailed levels (local authority or below). Such research has to allow for the confounding effects of land-use policy change related to past transport change (integration of land-use and transport planning is highly desirable in decision-making but unhelpful to research). This research should further investigate the impacts of location-related variables on productivity; the present guidance about the productivity effects of "moves to more productive jobs", with the assumption of permanently fixed differentials between local authority areas, are unconvincing. This research should be pursued

- a) on a multi-modal basis, recognizing competition and complementarity between modes rather than treating them in isolation (e.g. analysis may focus on the impacts of road network changes, but should control for the impacts of public transport changes or justify not doing so)
 - b) in a way that can be used in modelling (e.g. analysis of agglomeration effects that cannot be used when land-use change has to be considered is of limited value).
- 3.02 Data should be collected to allow research into the impacts of major investments and other interventions, but it has to be recognized that
- land-use/economic effects are gradual (though some aspects may also occur in anticipation), and hence that
 - any assessment of land-use/economic impacts will necessarily rely on modelling what would have happened in the counter-factual case, i.e. if the scheme had not been built.
- 3.03 Before-and-after or impact studies therefore do not contribute as much to future model calibration (or validation) as might be hoped. In general, research which can contribute to understanding and quantifying the economic and other longer-term impacts of transport (and related) changes is likely to be produced by econometric techniques based on panel data (observations for individuals, households, firms or zones at a sequence of points in time). This also requires data that has to be obtained from transport models for different points in past time and that is usually very difficult to obtain at present.

Validation

- 3.04 There are regular and very reasonable requests that more should be done to provide formal validation of land-use/transport interaction models. Such validation requires not only observed data on past land-use change but also outputs from transport models representing past years on a consistent basis. More should be done to ensure that transport models are set up for past years – preferably going back at least to the last Census but one, and ideally using a process of back-casting to test whether they give good forecasts of transport demand when fed with observed land-use for those years. This will then provide the transport modelling capabilities (generalised costs on a consistent basis over a significant historical period) to support serious work on validating land-use/economic models. As matters stand, the emphasis on keeping the base year of transport models as up-to-date as possible, and the lack of historical continuity or any other modelling of earlier years, makes it difficult or impossible to put forward realistically-priced proposals for land-use/economic model validation.
- 3.05 Once the inputs to support such validation are available, it should be pursued so as to inform improvement of the models (e.g. by testing how well particular relationships have performed over time, controlling for other effects), not just to get overall measures of goodness-of-fit.

4 HOW METHODS ARE USED

- 4.01 Spatial land-use/economic modelling is not just an extension of transport modelling. Developing tools that suggest that transport modellers can do such modelling as a minor part of the appraisal process is likely to lead to misapplication.
- 4.02 The development of “scheme specific” supplementary economic models is too expensive and in any case does not readily fit with the use of models to test alternative interventions (including alternative land-use development plans or priorities). More emphasis should be put on investing in models which can be used for a variety of purposes across an area or region, perhaps with additional local detail being introduced when required.

5 CONCLUSION – CONSULTATION QUESTIONS

- 5.01 We summarise here key points from the preceding sections as replies to the most relevant of the questions posed in Annex A of the consultation document.
- 5.02 *[6] What should DfT’s priorities be for improving the modelling and appraisal of transformational investments and housing, and why?*
- 5.03 We would recommend as priorities:
- a move away from trying to identify “transformational” investments and a focus on those which are intended to be integrated with other related interventions or which will affect other policies, either individually or because they form part of a wider programme;
 - for such investments or other interventions, that the Department should work with other ministries to adopt a “multi-sector” approach to appraisal that considers all the component interventions on an equal footing (in particular, not treating development proposals as simply an add-on to transport investment);
 - that such appraisal should focus on benefits in the form that the package or policy is intended to achieve, i.e. if the most important part of the strategic case for the package is improving the supply of housing, the focus should be on measuring the benefits of improved housing supply to residents.
- 5.04 *[7] What transformational impacts do we currently find it difficult to represent?*
- 5.05 Given that we specialise in modelling land-use and economic impacts of transport, our response may be different from the typical transport planning/modelling response; but we would identify two of the issues most likely to cause difficulty in agreeing on assumptions as
- agreeing on assumptions about long-term planning policies, given that many of the “transformational” schemes currently being considered will only open near the horizon year of current land-use plans; and
 - the “move to more productive jobs” effect as identified in WebTAG – we can make justified forecasts of how jobs will relocate, but the assumptions behind the “move to more productive jobs” calculations and in particular the

assumption of fixed differentials in GVA/worker between local authorities seem highly questionable.

5.06 *[11] What should DfT's priorities be for improving the development of modelling and appraisal tools, and why?*

5.07 In this respect, our recommendation would be to look to ensuring and demonstrating that WebTAG methods are recognized as widely applicable to achieving sound decision-making across transport (and related fields) and are not just treated as an obstacle to be cleared in seeking ministerial approval or funding.

Contact details

For further clarification or discussion please contact either

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[end]

Devon County Council's response:

Full list of consultation questions

Priorities

- 1 Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

Agree broadly with the 5 themes presented as suitable priorities. Of these, we would suggest that three below are most pressing.

- 'people and place',
- 'reflecting uncertainty over the future of travel' and
- 'supporting the application of WebTAG and making it more user friendly'

The pace of change in the transport industry has been rapid and modelling guidance needs to reflect this to avoid being left behind. This seems particularly poignant with the future of travel.

- 2 What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

The three areas listed above of People and Place, uncertainty of future travel and supporting the application of WegTAG and making more user friendly'

The uncertainty of future travel urgently requires more research and guidance. Within this, greater weight should be given to the falling individual trip rates experienced over the last 23 years (NTS). These changes are happening, yet the statement in 5.7 ("yet to fully understand this trend") does little to reassure that this will be anything more than an outlying scenario.

The use of additional scenarios would help in starting to address this, including defined sensitivity tests to make business cases consistent. It is however noted that the additional work required would increase the modelling process even further and it may conflict with the aspiration to streamline WebTAG.

The aspiration to streamline and simplify the guidance to make it more user friendly is welcomed. There seems to be misunderstandings of what is and isn't required or acceptable, and case studies would be welcomed to illustrate these issues.

Recent case studies on appraising housing delivery have helped provide more information for that area, and therefore this area maybe less pressing than others.

People and Place: capturing the range of impacts relevant to transport policy today

- 3 What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

- 1.) Enhanced guidance/information for assessing public realm improvements. Current WebTAG approaches typically result in negative transport benefits, resulting in schemes that are hard to justify or if approved, decisions that undermine the suitability of WebTAG for appraisal.
- 2.) Further guidance/information on suppressed demand. This would provide a tool to assist in those public realm schemes which typically include traffic reduction. Noted that there is guidance on induced demand, and ongoing work on this area (1.10). Given the economic theory for suppressed demand would be similar, it would be sensible to address the gap in information on suppressed demand as part of this.

In the first instance this could be a collation of case studies from around the UK, that could be summarised into a guidance note with key studies and information on those case studies.

- 3.) Appraising journey time reliability should be given more weight. Improved reliability can be just as, if not more important, than journey time savings. This is particularly relevant for public transport where passengers need to make connections.

Reflecting uncertainty over the future of travel

- 4 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

The uncertainty of future travel urgently requires more research and guidance. It is expected that this would result in greater acknowledgement of changing trip levels. For example, the NTS shows that individual travel levels have been falling over the last 23 years. This change has occurred across various purposes including shopping (-25% from 1995 to 2014), commute (-16%), leisure (-17%) with education being the only main trip purpose to have remained unchanged.

Sensitivity and scenario testing are a good way to consider this uncertainty in the appraisal process. The use of variable traffic growth would enable a more flexible approach to this key area of forecasting., although we acknowledge that any requirement for further scenario testing should be proportionate to the size of the scheme. A 'no background growth' scenario for all schemes could be an appropriate test.

- 5 What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these??

Some people in the industry still see the core BCR as the final figure. Although the departments guidance has moved away from this in recent years, it will take time for some decision makers to shift to a more sophisticated approach.

Additional sensitivity scenarios could be a good way to address uncertainty but it needs to be clear how these would feed into the overall value for money. The idea of an 'uncertainty toolkit' to give a steer on proportionality of uncertainty is a good idea, in principal, but needs to be clear to understand.

There is also a need to ensure baseline interactions and trends between variables are based on reasonable assumptions to avoid all forecasting resulting from these being misleading or incorrect. A transparency around any uncertainty of assumptions needs to be articulated to avoid the presentation of these as 'facts'.

Optimism Bias is only currently included in the economic case, with only risk being included in the financial case. This can lead to underestimating the overall cost of the scheme in the financial case or underestimating the BCR of the scheme in the economic case. The costs across the cases should be consistent and with both either including or omitting optimism bias.

Modelling and appraising transformational investments and housing

- 6 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

No comments

- 7 What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

Dependent Development. Not including dependent development in the core scenario makes sense if this results in an unrealistic level of delay. However, this makes it hard to model the transport benefits of a new scheme that is being delivered to unlock a development scheme. For example, if a new junction is required to provide the only access to a new development site, all of the development is dependent. Therefore, the core scenario Do Something includes the scheme but no traffic loading onto the new junction. This can result in negative/no benefits which seems impractical.

Supporting the application of WebTAG and making it more user friendly

- 8 What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

It has become apparent that some of the guidance is being misinterpreted. For example, the application of TEMPRO growth to a model when historic data shows traffic levels have fallen in the area over the last 10-15 years in an area which has significant development. A light touch, 'how-to' guide, potentially including case studies, could help mitigate this issue.

- 9 What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

Clearer guidance such as worked examples or conferences could overcome this issue.

Again, a light touch, 'how-to' guide, potentially including case studies, could help mitigate this issue

- 10 How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

Currently the technical guidance is readily accessible and relatively easy for us to navigate around. There is a danger that simplifying the guidance would result in it losing meaning. However, light-touch 'how to' guides might be useful for those who do not apply WebTAG, but need to be aware of its application e.g. Project Managers and in educating key stakeholders.

Developing modelling and appraisal tools that meet user needs

- 11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

The idea of a national model is welcomed, if this could be made accessible to local authorities. It is unclear how this would interact with the Highways England Regional Traffic Models currently being developed. Clarity on this matter would be welcomed.

Agree that a priority should be advice on scenario analysis within the forecasting guidance and that demand forecasting is challenging. We would support a review on the use and interpretation of the NTEM forecasts and particularly the opportunity to generate bespoke local forecasts. This is a key concern with the current guidance and would be welcomed as an addition.

- 12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

It is pleasing to see reference (2.20) to scheme promoters being encouraged to contact DfT at an early stage to discuss appropriate techniques. The protocol and contacts for doing so should be readily accessible.

- 13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

Use of Scenario Planning is welcomed. Care needs to be given to appropriate scenarios, and perhaps a wider range (but not necessarily more) scenarios would assist with this. For example, a range of scenarios using the current road traffic forecast projections all fall within a similar range and as such may reduce the insight that a wider range of forecasts could provide. As above, would suggest a no growth scenario should be included in any scenario testing.

Appraisal & Modelling Strategy – Informing Future Investment Decisions

ESCC Officer Response - Jon Wheeler, Team Manager Strategic Economic Infrastructure, East Sussex County Council – jon.wheeler@eastsussex.gov.uk

Date – 15th October 2018

Priorities

- 1. Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?**

ESCC agree with the priorities included which reflect current policy steers, although there is concern that the focus of the document is heavily based towards cities. To ensure greater equity, this document needs to be re-balanced towards the differing national geographies such as urban/rural authorities such as East Sussex. This would ensure that the appraisal strategy is in alignment with one of the governments key national strategy documents 'The Industrial Strategy', which emphasises the need to re-balance the economy.

In the final draft of the document, prior to outlining the themes for the strategy, it would be helpful if the final draft of the document included a more comprehensive section outlining the context for the guidance as on page 7 (Introduction), i.e. outlining what re-balancing the economy means. This could be utilised by local authorities with key stakeholders, to demonstrate how the appraisal and modelling strategy sits within the wider policy context or future challenges and opportunities. This would strengthen the linkage between the policy context and the methodologies used in appraising transport infrastructure schemes.

ESCC comments in regards to each specific priority area are listed under the specific questions below.

- 2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?**

User Friendly – ESCC suggests that existing guidance which users will be required to continue to use for modelling and appraisal, is more streamlined, user friendly and accessible to non-modellers. This is in relation to supporting local authorities in commissioning modelling consultancy services. In addition this applies to supporting local authorities in managing local stakeholders and explaining complex information. The use of case studies would be a simple option, which could be utilised to demonstrate the methodologies used and the outcomes of these.

Enhancing methodologies for sustainable transport schemes – The current methods utilised in WebTAG to appraise sustainable transport schemes are limited, and particularly favour larger highway based transport infrastructure schemes. Given the prominence of the government's Cleaner Growth Strategy, the IPCC's recent report on Climate Change and the DfT's recent National Cycling & Walking Investment Plan, as well as the greater funding opportunities for sustainable transport schemes, the guidance

needs to be re-balanced and provide applicable tools to enable appropriate comparison between scheme types.

In particular low carbon and sustainable transport modes need to be given additional value compared to traditional fuel modes to account for their disbenefits on air quality. The Intergovernmental Panel on Climate Change report published last week seeks to limit the 1.5 degree increase in global mean surface temps has given added impetus to this. Transport, including aviation and shipping contributes approx. 26% of total greenhouse gas emissions with road transport alone accounting for 21 percent of these.

Appraising smart technology – With increasing emphasis on smart technology either integrated as part of transport infrastructure schemes or as standalone schemes, a lead from the DfT on best practice in the emerging appraisal of these types of schemes would be welcomed. The sharing of best practice could again be through the sharing of national or international case studies.

Consistency alongside innovation - ESCC welcomes a shift away from the need for appraisals to be 'DfT Compliant' and the greater opportunities for securing funding, through consideration of wider benefits or greater innovation in appraisal. There should still be consideration given to a level of consistency in how appraisals are undertaken, especially in relation to competitive bidding for funding. Any best practice should be shared by the DfT.

Cross policy appraisal & other methodologies – Given the increasing number of opportunities which local authorities have in relation to applying for funding which cross policy areas, the DfT should consider whether other methodologies used for appraisal across government, may be appropriate and less complex, including the use of multi criteria analysis, which could be used alongside cost benefit analysis. This would be particularly beneficial where there are opportunities to integrate and strengthen the development of proposals alongside decision making.

Information sharing – With the opportunities to move towards greater co-development of bids for DfT funding and more innovation in appraisal, information sharing will be fundamental. As outlined above, ESCC would welcome the opportunity for an increase in the availability of case studies. Current information sharing tends to be more technical based and have more of a focus on how the methodologies can be utilised, but ESCC would also welcome if information sharing could be balanced towards sharing information on how the outcomes of appraisal have been utilised or expressed to local stakeholders.

People and Place: capturing the range of impacts relevant to transport policy today

3. What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

4.5 Appraisal methods for the future - ESCC are proactively assessing the opportunities for the use of technology in transport, and have recently undertaken a scoping report into how Smart Cities approaches could be applied in a urban/rural county such as East Sussex. Therefore ESCC supports the availability of approaches which can be utilised, sooner rather than later, with the need to constantly assess the appropriateness of these as technology in transport evolves.

4.9 – Public health and wellbeing - Air Pollution – ESCC would welcome the access to tools which could measure the impact of high pollutant concentrations on health at a localised level, as ESCC has two AQMA's and areas which breach particulate levels. ESCC would like to stress the importance of any future guidance being promoted cross

departments i.e. DfT/DoH (Public Health), to support cross departmental working at a local authority level.

4.16 – Person centred business cases – ESCC would welcome an increase in opportunities to utilise existing or new methodologies to assess the impact of transport schemes on users. The current outputs in assessing social and distributional impacts do not generate great prominence in appraisals. A move towards demonstrating impact at the level of the transport user would be beneficial to assess impacts on more marginalised sectors of society and provide a more inclusive approach. This would align with the DfT's Inclusive Transport Strategy. This type of assessment may also become more useful and necessary when assessing smart technology based infrastructure, to provide a more detailed analysis on different user groups, as this type of infrastructure will be more person centred.

Additional Comment

As outlined in question 1, ESCC wish to highlight that the focus of this theme is very city and urban focussed. The opportunities for appraisal in relation to this theme are also very relevant for more rural/urban authorities such as East Sussex. Therefore consideration needs to be given to re-balancing this section to incorporate wider geographies, which reflect the national picture.

Reflecting uncertainty over the future of travel

4. What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

5.8 DfT Research – ESCC agree that ongoing research is fundamental to inform the changing travel habits of our populations. Uncertainty is already included in the various versions of TEMPRO, which is more than adequate for localised schemes. However, this can potentially become complex, particularly for local authorities, because the methods proposed are more applicable at a national level.

5. What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?

5.12 National Level Forecasting - ESCC welcome the suggestion around publishing confidence intervals around forecasts in national level forecasts of GDP, population and fuel costs, which can be utilised in business case development, sensitivity testing, scenario and Monte Carlo analysis, to provide greater understanding around uncertainty.

5.15 – 5.17 Approaches & a Toolkit – ESCC agree that an 'uncertainty toolkit' would be welcomed, but that it must be both applicable and scalable according to scheme size and be user friendly, to take into account the limited resources available to local authorities in undertaking this element of business case development.

Modelling and appraising transformational investments and housing

6. What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

6.6 Framework – ESCC agree that an evidenced based framework should be developed outlining a strong emphasis on how local economies operate, alongside considering the impacts of transport investment.

The appraisal of wider benefits have very recently enabled ESCC to successfully secure funding from the DfT for the Newhaven Port Access Road where it was not possible to demonstrate the key strategic benefits using traditional transport appraisal methodologies and instead we clearly demonstrated that wider economic benefits the scheme would generate as an economic infrastructure scheme. ESCC would be keen to work in partnership with the DfT to develop a case study to showcase this example, which can be shared with other local authorities.

ESCC welcomes this approach for future impending bids, as it is often more challenging for urban/rural authorities, like ourselves to demonstrate high BCR's for transport infrastructure projects, yet the strategic case is often very strong at supporting wider economic benefits. ESCC strongly agree that this approach will be helpful to strengthen the case for integrating the appraisal of housing growth alongside local economic development.

Supplementary economic modelling

6.9 Supplementary economic modelling - additionality, land use transport interaction - ESCC would welcome additional opportunities to quantifying transformational or wider impacts. We realise that this area is in development and would appreciate the DfT sharing best practice in relation to this. We understand that this type of modelling is often reliant on robust evaluation of schemes. Whilst evaluation is integral to business cases, the development and delivery of this is often subject to the availability of funding, which can be challenging for many local authorities. Therefore greater prominence of this should be placed in relation to competitive government funding schemes.

Housing & Productivity

6.17 Productivity Impacts – ESCC would welcome increased methods to measure productivity, as mentioned, i.e. how improvement in long distance travel links between geographic areas could enhance productivity. This would be particularly relevant for ESCC in terms of building its business cases for strategic transport improvements in the county such as improvements to the A27 corridor between Lewes and Polegate.

7. What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

Transport Interactions with other forms of investment

6.20 ESCC agree that greater research is required to appraise greater integrated packages. In relation to house building and transport infrastructure packages, greater weight needs to be given to benefits of sustainable transport schemes. Whilst it is difficult to demonstrate that it will unlock housing, it is integral in supporting access, but this is demonstrate to appraise.

In addition there are also opportunities for a strengthened relationship between WebTAG and the NPPF, in relation to the issues between transport access and land use planning. This could be supported through the use of case studies.

Supporting the application of WebTAG and making it more user friendly

8. What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

The main barriers when applying WebTAG are in relation to appraising sustainable transport schemes. The current active mode appraisal toolkit is limited to measuring cycling schemes and are based on cost versus length. It does not enable the case to be made for improved junctions, which could reduce severance or improve accessibility, which could also help achieve mode shift, unless there are cycling related collisions and injuries that a scheme would help to address. The opportunities to apply this to schemes which support walking are also limited, which means that the benefits of these schemes are often overlooked. Given the DfT's Cycling & Walking Investment Plan, it is important that this is addressed.

The other key issue is in relation to the use of WebTAG and the challenges that local authorities often face with available resources to invest in appraisal and modelling, therefore this should be integral in the development of this strategy and the development of future appraisal methodologies and the opportunities for this to be scalable to scheme size and pragmatic in terms of weighting up the cost/time of updating models relative to the benefits that would be accrued

9. What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

As outlined in previous questions the use of case studies would be a practical solution to demonstrate the flexibilities of WebTAG. In addition to this, particularly for scheme promoters, having the availability of guidance which is more user friendly and aimed for use with key stakeholders who are non-transport modellers.

10. How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

ESCC suggest having a two staged approach for the guidance, 1. Technical guidance – for those undertaking the appraisal and modelling 2. Non-Technical – simple guidance on methodologies and expected outputs, which local authorities can utilise with stakeholders.

Developing modelling and appraisal tools that meet user needs

11. What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

From an East Sussex perspective, our three priorities would be:

- Improving the accessibility of guidance – see comments in previous questions.
- Exploring wider techniques – ESCC agree with this approach especially in relation to greater opportunities to focus on land use and economic modelling.
- Strengthening links with evaluation - ESCC is in agreement with this, see comments in previous questions.

12. How can we best encourage innovation whilst maintaining a consistent and robust approach?

The DfT, whilst encouraging innovation, must provide one voice on best practice to ensure consistency of use of methodologies and enable comparison of schemes where competitive funding is being sought.

The other key element to ensure a robust and consistent approach is that WebTAG must be streamlined and succinct document. The constant additions to WebTAG have often made it challenging to use. Therefore to avoid this, greater reviews of the document may be required as guidance and methodologies are developed.

13. What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

As outlined previously with increasing emphasis on smart technology either integrated as part of transport infrastructure schemes or as standalone schemes, a lead from the DfT on best practice in the emerging appraisal of these types of schemes would be welcomed by ESCC.



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Sent by email: TASM@dft.gov.uk

15 October 2018

Dear Sir/Madam,

TRANSPORT APPRAISAL AND MODELLING STRATEGY: INFORMING FUTURE INVESTMENT DECISIONS

England's Economic Heartland established the Strategic Transport Forum in February 2016. Membership of the Forum covers the area from Swindon, through Oxfordshire, Milton Keynes and across to Cambridgeshire, and from Northamptonshire across to Luton and Hertfordshire.

The Strategic Transport Forum is the emerging Sub-national Transport Body for the Heartland region. It is the focus for a single conversation on strategic transport issues and maintains the overview of strategic investment priorities. The Forum works closely with the Department for Transport, Highways England and Network Rail, all of whom are members of the Forum.

Strategic Context

The National Infrastructure Commission's (NIC) has identified the economic potential of the Heartland area as being of national significance to the long term future of the UK economy. The Interim Report identified the potential to increase the value of the corridor's economy by between £85bn and £163bn over the next 30 years. The Commission identified improved connectivity as being one of two critical issues that needs to be addressed in order to realise that opportunity.

The Government's response to the NIC in the Budget (2017) endorsed the Commission's view of the national significance of realising the economic potential of the Heartland area.

England's Economic Heartland in its role as an emerging Sub-national Transport Body recognises that transport investment decisions need to be informed by a robust understanding of the range of benefits and impacts that proposals might generate.

The challenges presented by transformational growth, the resultant step changes in travel patterns, together with advancements in technology and environmental considerations continue to change the landscape of transport investment appraisal. In particular, technology enabled user centred services – such as those accessed via ‘apps’ – are fundamentally changing the way in which transport service providers are responding to user needs. It is essential that our approach to appraisal does not inadvertently encourage the continued promotion of solutions that reinforce current travel patterns and behaviours that are unsustainable.

It is essential that our decision making is supported by a flexible approach to appraisal, one that better recognises that the approach required for strategic decision making is different from that required when assessing the detailed options for a particular proposal.

Consideration of strategic options requires the need to take into account the wider economic and place shaping opportunities created by investment in infrastructure and services. However in so doing there is a need to review the approach to assessing the implications of transformational investment on the macro-economic situation.

For example, the underlying premise of the National Infrastructure Commission’s argument in support of the Heartland is our ability to improve economic competitiveness in global markets. In these circumstances, the increase in GVA sought by the investment should be viewed as being additional to the UK total, and not simply displacement from elsewhere.

England’s Economic Heartland’s work considers the wider strategic infrastructure requirements that are a consequence of planned and future growth. This approach ensures that our consideration of transport infrastructure needs takes into account the implications of investment in digital and other strategic infrastructure. It is essential that the approach to transport appraisal is better able to take into account these wider connections.

Our response focuses on future opportunities and constraints regarding WebTAG application within the five strategic themes set out in the consultation. Where possible, it will address the consultation questions posed by the DfT sequentially herein.

Overarching Comments

England’s Economic Heartland – together with our colleagues in the other Sub-national Transport Bodies – is putting in place the ‘regional evidence base’ that will underpin and inform the development of our overarching Transport Strategy.

For England’s Economic Heartland the ‘regional evidence base’ consists of three elements:

- The ‘database’ (available since February 2018) – this brings together information on planned growth (housing and economic), socio-economic data and transport information
- The ‘datahub’ (work underway) – in effect a ‘sandbox’ that supports the development of the eco-system across the Heartland that encourages innovation

- The 'Policy Scenario Model' (proof of concept now available, with full capability from spring 2019) – this will provide the Heartland with the capacity to explore the relative implications of different scenarios – this could be related to the scale and distribution of growth, it could also be related to different policy scenarios.

All elements of the Regional Evidence Base are/will be available to all local authorities across the Heartland for their own use, as well as being used by the EEH Business Unit to underpin the work of England's Economic Heartland Strategic Alliance.

The Policy Scenario Model has been developed specifically to enable the EEH Business Unit to assess the relative merits of alternative policy scenarios. The current approach to appraisal is hard to apply in support of genuinely long-term strategic transport planning. We strongly recommend that this is an issue that needs to be addressed as part of the review now underway. England's Economic Heartland would welcome the opportunity to work with the DfT in exploring this issue further.

Although not the subject of this consultation, a key component of the approach to appraisal is understanding the financial envelope within which investment decisions are to be taken. As an emerging Sub-national Transport Body, England's Economic Heartland continues to argue for the Government to set an indicative funding envelope within which investment priorities are then made.

The Government provided the National Infrastructure Commission with an indicative funding envelope when it was tasked with providing advice on national investment priorities for the longer-term. A similar approach at the regional level would provide the decision makers – the Sub-national Transport Bodies – with a clearer context within which to develop their investment priorities.

Priority Themes

England's Economic Heartland in principle agrees that the five strategic priorities reflect some of the most pressing priorities for development of its appraisal and modelling guidance. However this must be seen in the context of the point made above. The level of detail required to enable decision making at the strategic level is different from that required when considering the detailed options for a proposed scheme.

A fresh focus on capturing the needs of people, place and the environment is core to future appraisal considerations. Planning for uncertainty within WebTAG will be challenging but is absolutely essential, particularly when the appraisal period used is so long, and the likelihood is that societal and business needs will fundamentally evolve during that time period (encouraged by policy frameworks established by other Government departments). It is thus essential that our approach to appraisal is underpinned by a commitment to understanding and allowing for social and policy changes via scenario planning. DfT may want to consider previous literature in this area, including CIHT 'Futures' study, Highways England 'Planning for the long term' and the Commission on Travel Demand 'All Change' report.

We agree that appraisal of major infrastructure projects must better capture their broader objectives and benefits. A particular challenge that needs to be addressed is the need to

consider the potential benefit of co-ordinated smaller scale interventions – both capital and revenue – that are potentially better targeted in addressing the needs of users.

Efforts must be made to capture impacts of transformational investment that transcend conventional transport boundaries and benefits. England's Economic Heartland is keen to ensure such an approach informs the work taken forward on the Connectivity Study to understand how communities not on the Expressway itself can still benefit from it. We would offer this piece as a potential test bed for considering how our approach to appraisal might evolve to enable such flexibility.

Finally, those themes that focus on the WebTAG user are recognised by England's Economic Heartland as being core to new guidance. Improving the user experience and considering new sources of transport evidence will ensure that decision making is more responsive to changes in the expectations of users – both individuals and businesses.

People and Place

England's Economic Heartland argues that the existing WebTAG appraisal guidance must do more to capture cross-sector benefits. Town centre schemes may do more to shape place-making and revitalise the local economy, and the majority of benefits in sustainable travel schemes are often centred on health. The undue weight afforded to journey-time savings in WebTAG means appraisal of softer walking/cycling schemes are systematically undervalued, resulting in an inevitable bias towards road-based projects. Health benefits (air quality, noise, inactivity) are underestimated in WebTAG at the expense of journey-time savings but have a much higher value in reducing deaths and serious illnesses.

These journey time savings are often not realised in the long term. Analysis has shown that a reduction in journey times have translated in commuters opting to live further away, where the time saving is exchanged for increased journey lengths. In addition, individual's choices on location are often a consequence of multiple factors – including housing affordability, the location of work for parents, access to schools and other services. The guidance must review the limitations within the appraisal system that are the consequence of the limitations inherent to the ability of traffic models to predict short term changes in behaviour that has arisen as a result of capacity expansion, shifting dormant traffic onto the improved part of the network. Modellers should be cautious of changes in latent traffic demand, particularly when monetising journey time savings.

In summary, when considering options at the strategic planning level, non-monetised elements of the transport analysis must be given greater emphasis within the appraisal framework. Whilst consideration of the Benefit: Cost Ratio is important, it should not be the dominant driver in strategic planning.

Reflecting uncertainty over the future of travel

England's Economic Heartland believes that national policy can mitigate uncertainty by agreeing on a shared vision addressing what it wants to achieve long term, and policy scenario models should subsequently 'fine-tune' plausible future states as opposed to developing them from scratch.

In scenarios whereby the future is unclear, the strategic case should be afforded more weight in order to reduce the temptation to spend money on transport modelling that offers little insight into benefit realisation.

We believe a fundamental review of addressing future demand needs to be taken to ensure transport planners, scheme promoters, sponsors and decision makers are aiming for the same strategic vision and schemes can be aligned accordingly.

Modelling and appraising transformational investments and housing

In revising the WebTAG guidance there is an urgent need to consider how better to reflect the role of transport investment as an 'enabler' of economic connectivity. Currently, schemes tend to be appraised in isolation, despite the fact that infrastructure interacts with other projects as part of the wider place; the net result of the project is often much greater than its single value.

England's Economic Heartland believes there is a genuine case for greater devolution and autonomy in transport scheme appraisal to enable implementation of regionally led, cross-sector visions. The requirement to prioritise investment decisions within an indicative funding envelope will help reinforce the importance of decision makers making an informed choice based on the likely level of funding available.

In addition to this, appraisal methodology should consider the extent to which existing communities and demographics may create a behavioural change 'groundswell', particularly in the case of walking and cycling investment. Sustainable transport interventions can harness and accelerate new demand from associated growth effectively, particularly when interventions are delivered on a larger scale.

The needs of planning authorities and land based planning policy should be embedded into new appraisal guidance. The DfT's proposals for new measures to improve confidence in the estimations of land value uplift to monetise benefits need to be considered further in order to avoid placing unrealistic expectations on the planning system to secure financial contributions. The reality is that 'hope value' is 'locked-in' to land deals far in advance of land being identified through the relevant local plan. Moreover, viability assessments undertaken at the time a planning application is considered will not reflect the economic situation at the time a development is built out.

Alternative approaches to 'capturing' the added value have been put forward in the past – including the use of local 'roof taxes' and ring-fencing the increase in stamp duty for local communities for a time-limited period. Consideration of this issue requires a wider discussion across the public sector and with the private sector: it will not be resolved through a review of our approach to appraisal.

Supporting the application of WebTAG and making it more user friendly

Experience amongst transport planners suggests that WebTAG can be overly prescriptive. Notwithstanding assertions that the approach set out in WebTAG is guidance, the reality experienced by our partners is all too often that this is not the case. As a consequence, time

and resources are spent preparing a 'WebTAG compliant' analysis as the 'base-line' against which a proposal is then considered.

This view can be felt strongest on smaller schemes with lower value; often viewed as a set of rules to be followed to unlock funding. Perhaps a less descriptive, strategically determined approach would allow for greater innovation and better capture of wider benefits.

Generating benefits from the appraisal process should consider less prescriptive techniques where possible, which in turn are less labour and time intensive. Appraisal guidance should deter analysts from re-calculating inputs to get a desired output where possible.

Once again, the identification of an indicative funding envelope within which prioritisation of investment is undertaken will ensure that decision makers in the Sub-national Transport Bodies make an informed choice within the level of public funding available.

Freight

England's Economic Heartland agree that the modelling of freight requires a more concerted effort to more accurately assess and forecast freight flows on the network. A review of best practice for freight modelling and gaps in understanding would be hugely beneficial, given the vital role that freight plays on the SRN and emerging MRN.

England's Economic Heartland has commissioned work to plan for the regions' long term freight needs and is happy to engage with you on this piece of work, particularly where there may be synergies with your analysis.

Developing modelling and appraisal tools that meets users' needs

England's Economic Heartland recommends that new WebTAG guidance incorporates the 'reflexivity' of transport planning intervention to predict and shape what future demands of the future network will be. Forecasts of the future based on past trends do not always favour transformational changes, and so travel demand forecasts should be treated with caution.

As referred to previously in this letter, the principle of appraisal should be aimed at plausible futures, and shaping them, rather than trying to get exact precision on the most likely vision of the future. England's Economic Heartland is appraising the impact of future 'what if' scenarios stretching out to 2050 by the use of a ground breaking modelling tool. This will help us to make well-informed decisions in the Heartland, and we're happy to share our findings with the Department for Transport.

Yours faithfully,

Martin Tugwell

Programme Director
October 2018

Appraisal and Modelling Strategy - Informing Future Investment Decisions Consultation Response: First Rail Holdings

This consultation response represents the views of the organisation First Rail Holdings Limited (FRH). FRH is part of FirstGroup plc and the parent of the Train Operating Companies trading as Great Western Railway, TransPennine Express, South Western Railway and open access operator Hull Trains.

We are aware of, and have contributed to, the development of Rail Delivery Group's separate consultation response, and agree with the content of the drafts that we have seen of this. There are a few points that we are particularly looking to emphasise, to supplement the RDG response, in our own submission. Our response relates to the economic modelling of rail schemes within the overall WebTAG framework.

Priorities

- 1 Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

Yes.

- 2 What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?

The areas where we are providing a consultation response relate to the 2nd, 4th and 5th themes: reflecting uncertainty over the future of travel, supporting the application of WebTAG and making it user friendly, and developing and maintain modelling and appraisal tools to meet user needs. In summary:

- We see WebTAG evolving into an increasing complex framework that makes modelling of rail impacts technically difficult and resource intensive. We have concerns about the balance between precision and accuracy in some of the inevitable trade-offs that the economic framework has to make, particularly where we feel these trade-offs are being applied inconsistently. Overall, this can lead to unnecessary complexity in calculation, for uncertain/little/no improvement in the accuracy of the modelled results.
- There is an opportunity for the DfT to work more closely with RDG's Passenger Demand Forecasting Council, to coordinate these two groups' transport research activities more effectively, to all parties' benefit.

People and Place: capturing the range of impacts relevant to transport policy today

- 3 What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

Nil response.

Reflecting uncertainty over the future of travel

- 4 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.
1. Refine understanding of sources of uncertainty in the existing WebTAG framework.
2. Use this improved understanding to justify a simplification in the typical level of analytical detail required – particularly in relation to low-level geographical disaggregations driven by uncertain inputs.
3. Consider reinvesting a portion of the analytical effort saved in (2) above to introduce scenario-based quantifications or simple sensitivity analysis.
- 5 What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?

We believe that one major challenge to developing the treatment of uncertainty is that the levels of uncertainty in the existing WebTAG framework are not always well understood.

For example, there is uncertainty in all the forecasts that the WebTAG framework draws on, and to a degree there is also uncertainty in the historical data used for developing the parameters that WebTAG recommends, as well.

Forecasts of different growth drivers are typically not independent of each other. This is true even for some of the most fundamental national level forecast metrics such as inflation, GDP, population and employment. Nevertheless, the temptation is to compile data from multiple forecasters as well as other sources, with no certainty that their forecasting assumptions are consistent. This must impact forecast accuracy.

Geographical disaggregation adds further uncertainty, and typically the smaller the geographical areas being forecast the worse this effect gets. Disaggregation methodologies are often not transparent and different forecasters can develop significantly different forecasts for city-level growth, for example, even when their data can be aggregated up to similar national-level totals.

We believe that the difficulty in producing robust forecasts that are: (a) consistent between the different growth drivers the modelling requires, and (b) disaggregated to

the detailed level WebTAG currently recommends, is a significant constraint in modelling accuracy. As a result, we have concerns that the level of detailed modelling required tilts the balance too much in favour of calculation precision, rather than accuracy, and does not justify its complexity.

A more detailed investigation might be able to support or refute this hypothesis. Our intuition is that a simpler forecasting structure would prove more manageable, without sacrificing accuracy, and would enable more effort to be dedicated to scenario analysis or other value-adding activities.

Publishing confidence intervals around forecasts would be one possible approach to managing uncertainty, but in general we would expect different forecast drivers not to be independent of each other, so this would require a relatively sophisticated correlation-based approach in order to be meaningful. In practice, it would likely prove more workable to develop a range of scenarios for evaluation, each with a coherent set of drivers for that scenario, that could be developed to be internally consistent.

Overall, while supportive of the desire to capture uncertainty in transport appraisal, we are not in favour of increasing the complexity of the analytical framework overall, so would hope that this can be balanced by reducing modelling complexity elsewhere in the guidance. This would provide benefits by encouraging more general use of WebTAG-based forecasts, for example in rail franchises, by improving incentives on operators to use these tools in-life and keep them up to date.

Modelling and appraising transformational investments and housing

- 6 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.
- 7 What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

Nil response.

Supporting the application of WebTAG and making it more user friendly

- 8 What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

In our view, the main barrier is that the framework is too complex to manage on an informal or ad hoc basis and that over time the framework is increasingly “by consultants for consultants”.

It is also relatively difficult to make an evidenced case for deviating from the recommended or default approach, even where this suspected as not being the most effective.

9 What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

One mechanism to achieve this might be by providing better access to some of the key industry revenue and demand datasets to enable users to investigate the relevance of the guidance for their specific application, through back-testing. This would promote the use of the flexibilities in WebTAG by providing a mechanism through which alternative approaches could be easily developed and calibrated. We understand that there are stakeholder sensitivities with this in relation to data ownership and commercial risk. However, we also see MOIRA being used as a standard industry tool, containing the same or similar data and allowing access in a variety of well-defined and controlled ways. We suggest that it might be possible and desirable to extend this approach, either with the MOIRA replacement or through some other delivery channel. The ideal would be to enable users to calibrate their own statistical models against this dataset, or to re-run established models such as that of the Rail Demand Forecasting Estimation Study against updated datasets or different geographical areas.

It would also be helpful if DfT were able to provide access to a series of best practice example appraisal models, which could help to ensure that the guidance is applied in a consistent way across the industry and avoid unnecessarily “reinventing the wheel”.

10 How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

DfT could build on the success of its WebTAG data book, perhaps by compiling the rail exogenous driver elements together into one spreadsheet/location, or by further standardising the way the drivers are collated and presented. It might also consider providing reference implementations of WebTAG calculations in spreadsheet format, covering the common uses of the data within the rail forecasting framework, particularly with respect to exogenous growth drivers.

Developing modelling and appraisal tools that meet user needs

11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

In terms of the detailed prioritisation, as part of its work we suggest that DfT engage with PDFC to develop a joined-up approach. While it is for the DfT to determine how closely it might want to work and engage with PDFC, we believe it would be helpful if it could share with PDFC sufficient detail for both parties to be able to develop their plans in ways that complement each other, to avoid them overlapping or being in conflict. We believe that this is in the best interests of all parties involved.

12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

Nil response.

13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

Nil response.

This is the response of Freightliner Group, which is part of Genesee and Wyoming's UK/Europe Region companies, to the consultation on priorities for the Department for Transport's Appraisal and Modelling Strategy.

With constraints on infrastructure funding it is more important than ever that infrastructure investment delivers highest value for money. It is not always clear to us what is and what is not included in transport investment appraisals and therefore we welcome the opportunity to make some general observations in response to this consultation.

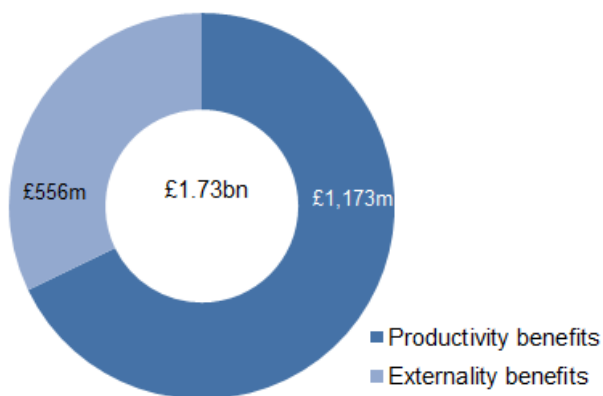
Freight benefits

The consultation acknowledges that although enhancements have been made to the modelling of transport users and passengers, the modelling of freight requires a more concerted effort to improve. Freightliner would welcome such a focus as we believe that the current appraisal methodology undervalues investments to support modal shift to rail.

The consultation focuses mainly on appraising the benefits of transport to individuals as users and not the benefits to businesses of improved connections, wider market opportunities and improvement in productivity. Therefore we would welcome an appraisal methodology that focusses on businesses as well as people – noting that if businesses are more productive and have greater opportunities to access more markets they will be more successful in turn will create more employment and generate more taxation.

The current appraisal methodology for freight schemes only considers the benefits of modal shift from road to rail and does not include any of the productivity benefits that accrue by reducing the cost of transporting goods for Britain's businesses. KPMG estimated that in 2016 rail freight delivered economic benefits totalling £1.73bn per year¹. This was split between congestion and environmental benefits totalling c£0.5bn and productivity benefits for UK businesses totalling c£1.2bn of productivity - see Chart 1.

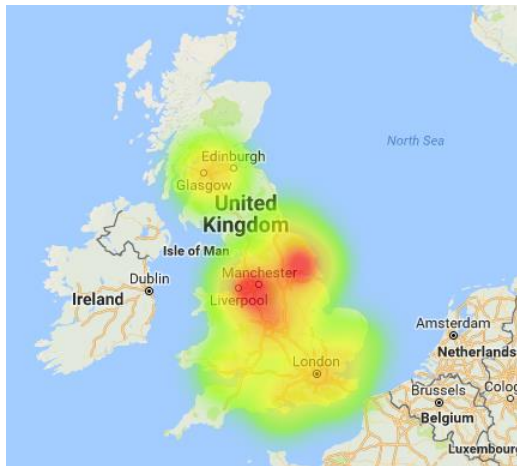
Chart 1: Economic benefits of rail freight



The KPMG analysis disaggregates the productivity and externality benefits to a regional level, to enable a better understanding of rail freight's role in supporting regional economies - see Chart 2.

¹ Rail freight in GB - productivity and other economic benefits, KPMG, 2018

Chart 2: Heat-map - Regional rail freight benefits



The heat-map illustrates rail freight's role in supporting businesses around the country with the majority of the benefits accruing in four regions - North West, Yorkshire and the Humber, Scotland and the West Midlands. Together these regions accounted for nearly 60% of the total national productivity and externality benefits delivered by rail freight in 2016².

Factoring in productivity benefits

Despite rail freight generating significant productivity benefits for UK plc, guidance from HM Treasury to Central Government in the Green Book currently only allows externality benefits generated by rail freight to be considered, when evaluating the benefits of projects that support rail freight. It is not clear to us whether this is just the congestion benefits or whether this also includes carbon benefits and improvements in air quality.

Nevertheless, without considering the productivity benefits generated by rail freight, alongside the externality benefits, the holistic economic benefits of rail freight will not be fully factored into appraisal and modelling. This is likely to significantly underplay the value of schemes to drive freight modal shift from road to rail. Given rail freight's role in supporting the productivity of Britain's businesses, a change in policy whereby productivity benefits are factored into the evaluation methodology, could drive more informed decision making.

Benefits of agglomeration

Including the productivity benefits within the appraisal models would still likely undervalue the benefits of rail freight because the underlying measurement is still a comparison of rail versus road. It would not measure the benefits directly generated by rail freight, for example the benefits of agglomeration because businesses are better connected with each other and with the markets that they serve.

We are not aware that the benefits to businesses of efficient, reliable and direct freight services are included in any appraisal models. Providing links for businesses to access markets that would not otherwise be easily accessible, e.g. for niche products like pot ash, is a key offering of rail freight.

The provision of efficient freight links also improves the competitiveness of businesses internationally and can act as a catalyst for wider investment. For instance the provision of good transport links will increase the attractiveness of markets relative to other markets with poorer connections. This in turn can stimulate wider benefits, by creating wider employment opportunities and supporting the development of skills hubs. The direct freight trains that connect areas of production such as the Midlands, North-East, North-West and Scotland directly to the major deep-sea ports in the south and east are a good example of

² Rail freight in GB - productivity and other economic benefits, KPMG, 2018

this. These direct rail services to ports connect manufacturing regions with overseas markets and the accruing economic benefits at a regional level are clear from the KPMG analysis above.

The provision of multiple services per day provides more connection opportunities and further multiplies the benefits. Good connections incentivise businesses to cluster around each other, for example a well-connected rail freight terminal will in turn create wider employment opportunities.

We do not believe that the increased agglomeration benefits are considered within the current appraisal methodology. Without including the benefits that arise from the spatial agglomeration enabled by rail freight, investment appraisals will likely underplay the benefits of investments in freight schemes.

Macro trends

The consultation correctly identifies a number of macro trends that could have significant implications on demand for passenger rail travel. We are already beginning to see a stagnation in passenger numbers on certain routes and the Office of Rail and Road reported that Q1 2018/19 was the eighth successive quarter when passenger journeys using season tickets declined³. There are clearly changes to the way people travel, no doubt as a result of rapid digitalisation that has allowed people to work more flexibly and often more productively. As a result there is considerable uncertainty about future passenger patterns of travel.

In contrast to the trends we are seeing with passenger travel, the movement of freight cannot be easily replaced by digitalisation, as it requires physical movement. With demand for passenger travel being impacted by technological advancement, and significant latent demand to grow freight volumes by rail, we would expect the macro trends to be considered and give rise to a high priority for freight in the appraisal of different programmes.

The consultation notes challenges in appraising and capturing the value of improvements to reliability of freight travel. Continued trends in the rise of 'just in time' delivery and the strong scheduling constraints faced by the sector are described.

We would welcome consideration being given to explore different approaches to capture these reliability and journey time benefits. Without their inclusion in the appraisal methodology it is likely that the benefits of rail freight schemes will be underplayed as rail freight offers significant reliability benefits in comparison to road.

While unplanned delays affect both modes, rail continues to be a far more reliable mode than road. Average delay on the Strategic Road Network is now estimated to be 9.0 seconds per vehicle per mile⁴, 46 seconds nationally and 80 seconds per mile on 'A' roads in city centres. Conversely only 4.4 seconds of delay per mile were caused on average nationally to freight trains in the year ending March 2017⁵.

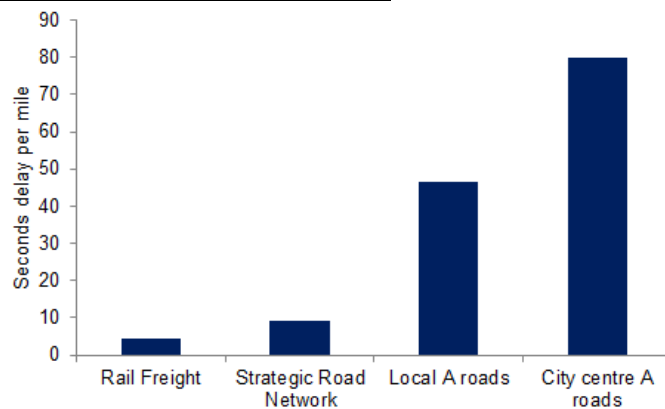
A key difference between the modes is that unlike road, rail freight is planned and timetabled with the assumption of no delay. This fundamentally makes rail a much more reliable mode and, provides greater certainty, enabling customers to plan their logistics chain with greater efficiency.

3 http://orr.gov.uk/__data/assets/pdf_file/0003/39342/passenger-rail-usage-2018-19-q1.pdf

4 Travel time measures for the Strategic Road Network, England: 2016, Department for Transport, 2017

5 Average delay on local 'A' roads: monthly and annual averages, Table CGN0502, 2017

Reliability of road and rail freight



Investment in freight schemes

The benefit-cost ratios for freight enhancements are very strong and should be considered in investment planning. Investments in the Strategic Freight Network (SFN), which was recognised in the 2016 report by Dame Colette Bowe as an example of good industry practice⁶, have delivered excellent value for money. Typical Benefit : Cost ratios achieved in the last control period and predicted this control period are between 4:1 and 8:1⁷, demonstrating the high value for money this approach to funding is achieving. The network costs are largely sunk and the incremental investment in the network has the opportunity to deliver significant value.

A good example is the investment in the last control period to gauge clear the line between Southampton and West Coast Main Line to allow worldwide standard 9'6" high containers to be transported on standard wagons. The £71 million project was funded via the SFN fund, with a contribution from the Port of Southampton⁸. The benefits of this investment were very quickly realised and within 12 months following the completion of the gauge clearance, rail's modal share to and from the port increased from 29 to 36%. The financial analysis for the project indicates that the £71m project as having a net present value of £376m⁹.

Holistic approach to transport planning

It is important that the freight transport network is planned holistically and seeks to leverage the relative strength of each mode. A cross-modal perspective will allow for a sophisticated policy mix that doesn't favour one mode over another and delivers maximum value out of the network - a network that has been developed over many decades.

Currently a cross-modal comparison is difficult because the modes are not competing on the same basis. The lack of internalisation of HGV costs needs to be taken into account as this makes it more difficult for rail to compete. HGVs currently internalise c30% of the external costs that are imposed on society, which equates to a £6.5bn subsidy each year¹⁰.

The appraisal methodology should consider all the modes on the same basis. The current approach, where HGVs internalise fewer of their externalities than rail, risks undervaluing investments to support modal shift to rail.

6 <https://www.gov.uk/government/publications/bowe-review-into-the-planning-of-network-rails-enhancements-programme-2014-to-2019>

7 Network Rail Freight and National Passenger Operator draft Strategic Business Plan - December 2017

8 Increasing rail freight's modal share, Rail Technology Magazine, 2014

9 Increasing rail freight's modal share, Rail Technology Magazine, 2014

10 <http://freightonrail.org.uk/ConsultationsHMTreasuryCallforEvidenceRedDiesel.htm>

Mass haul capability

The pressure to increase house-building and build infrastructure that is fit for the future requires large quantities of aggregates to move into urban areas to support house building, roads etc. The trend towards more super-quarries, for instance in the Peak District and the Mendips, and the importation of aggregates from overseas markets lends itself to the movement of this construction material by rail, which is more competitive against other modes when large quantities of freight are moved over longer distances. The mass-haul capability means that each freight train can move enough material to build up to 30 houses.

Largescale infrastructure projects such as HS2, Crossrail 2, Heathrow third runway, Hinckley Point and Sizewell will challenge the ability to source sufficient aggregates material from within the UK. This will likely see more construction materials imported from overseas markets through the regional ports around the UK, which will likely be a positive trend for rail.

The mass-haul capability of rail freight, and its ability to move materials efficiently to support house building and help deliver the UK's large infrastructure projects, is not currently considered in the appraisal methodology.

Challenges

For many businesses it is not always clear what is and what is not included in the investment appraisal methodologies. Many businesses, like ours, do not have in-house economic experts and therefore it is difficult for us to understand and access the appraisal toolkits. Increasing the understanding of the appraisal methodology would be welcome. Making the calculations and assessments more accessible would enable organisations to better support appraisals, by allowing organisations to more easily supply data that could be used to help develop and refine the modelling.

Our ref: DfT WebTAG consultation

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15 October 2018

Dear Sir or Madam,

Appraisal and Modelling Strategy Consultation

This letter is the Highways England Strategic Design Panel response to the current consultation on priorities for a new Appraisal and Modelling Strategy by the Department of Transport.

Established in 2015 pursuant to Highways England's Licence, the Panel comprises design experts and relevant stakeholders and provides advice on design issues to support a shift of design culture in Highways England and the wider sector. A key element has been the publication of 10 principles of good road design (*The road to good design*, Highways England 2018), which cover both process and outcomes. The Panel has since identified a number of barriers to improving design quality. These barriers include aspects of appraisal and the Panel welcomes the current WebTAG review and the opportunity to contribute.

Design quality

Good design should be about taking a multi-disciplinary approach from the start to maximise opportunities rather than being a mitigation tool at the end of the process. However, existing methodologies can overemphasise those factors that are easier to measure over those that may help deliver greater social value in the long-term. Therefore, it is difficult for schemes to justify improved design quality through the appraisal process. This is despite evidence (e.g. *The Value of Design in Infrastructure Delivery*, National Infrastructure Commission 2018) that good design can indeed add value. In particular, good design can help, whether in terms of better process or indeed outcomes, gain acceptance of national infrastructure by local communities and speed up the planning process.

Consultation themes

Regarding **People and place**, our design principle 4 (fits in context) as well as design principles 2 to 6 (is inclusive and is environmentally sustainable) are relevant. For example, little weight is currently given to qualitative assessment of landscape or townscape character, particularly for areas that have no statutory protection, and emerging quantitative methods appear to confuse land use value with landscape. Consequently, benefits can appear to be primarily driven by time savings and options do not always fully take into account the context. The quality of the landscape and townscape can make a significant contribution to both sense of place and user experience however, yet it can sometimes appear difficult to justify investment in these areas beyond essential mitigation.

As priorities, the Panel would like to see improved consideration of the quality of urban realm and the landscapes between, not just for the benefit of communities affected by new road infrastructure, but to also enhance the visual experience of road users.

Principle 10 (is long-lasting) is relevant for **Uncertainty over the future of travel**. Making road schemes more adaptable may entail higher initial costs but be significantly cheaper over an asset's lifecycle. For example, retrofitting new technology may be disruptive for users as well as add to visual clutter in future. Similarly, making subsequent adaptations for climate change or unpredicted changes in population will be costly and disruptive. New methods are needed to appraise the benefits of adaptability of infrastructure.

In relation to **Modelling and appraising transformational investments and housing**, principle 6 (is environmentally sustainable) is relevant. Positive opportunities, which could be transformational in deprived areas or help secure net biodiversity gain for example, currently appear to be undervalued. New methods are needed to help prioritise where gains would add most value and to consider how transformational investments can best unlock the creation of thriving places for both people and nature.

Principle 9 (is collaborative) should inform **Supporting the application of WebTAG and making it more user friendly**. The more accessible WebTAG becomes to a wider range of professionals involved in road design, the more multi-disciplinary and multi-functional the solutions will be.

Finally, regarding **Developing and maintaining modelling and appraisal tools**, while principle 8 encourages innovation and the use of 'big data' has much potential, often the most important and memorable design elements are those hardest to quantify and these should not be squeezed out by an overemphasis on new technologies. The opportunity may simply be that WebTAG becomes a more multi-disciplinary and collaborative tool.

The Panel would welcome further engagement as the new strategy emerges.

Yours sincerely



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Chair of the Highways England Strategic Design Panel

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15th October 2018

For the attention of the Transport Appraisal and Strategic Modelling Division

Dear TASM,

**Transport appraisal and modelling strategy: informing future investment decisions
Consultation Response**

Highways England welcomes this opportunity to share their views on the direction we feel the DfT Appraisal and Modelling Strategy should take. It is pleasing to see that the DfT is reaching out to the industry to obtain their views on areas in which the guidance can evolve.

We recognise that WebTAG is a key piece of guidance and are pleased to have the opportunity to contribute to its further development. We wish to continue to work closely with the DfT in the development of WebTAG and Highways England's Appraisal Manual.

With respect to the complexity of the appraisal system, we welcome the continued emphasis on proportionality by the DfT but also recognise that the expanding range of impacts which are encouraged or required to take account of could push us in the opposite direction. By closely working with you we would like to seek to achieve the right balance in this regard.

Our views on the consultation questions are set out below.

Priorities

- 1. Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?*
- 2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?*

We agree that the themes largely reflect the most pressing Appraisal and Modelling priorities. However, we would argue that greater emphasis should be placed on understanding and predicting freight transport, which remains one of the most under-developed areas of transport analysis, yet is central to the role of national transport networks. Another area that seems to be missing from the consultation is the appraisal of maintenance and renewals interventions. We also feel that consideration needs to be given to the links between strategic modelling, which is often used to assess major schemes, and more local modelling.

Programmatic appraisal is one area of significant interest to Highways England, which is not discussed in the consultation document. This is in part related to DfT's uncertainty guidance which, appears to discourage a programmatic approach (whereby one would test the sensitivity of a scheme's business case to other future investment proposals) when there is significant policy uncertainty. Whilst this makes sense for a core scenario, it risks biasing the analysis when policy is fluid or when schemes are at early stage of development.

With respect to uncertainty, there is indeed some evidence that secular trends in travel preferences could be changing, as the result of wider technological and socio-economic changes (distance working, online shopping, home delivery). However, it seems premature to say that we face unprecedented uncertainty.

With the Government priority on 'Transformational Developments' we would welcome guidance specifically dealing with such developments.

With regards to on-going institutional changes, it has become increasingly apparent that there is a tension between net national impacts (the focus of the Green Book, WebTAG and national agencies) and local impacts. This tension means that it is more important than ever to clarify the conceptual underpinnings of transport appraisal. The goal should be to help minimise the scope for misunderstanding over what evidence should be firmly part of the economic case and what evidence would be more appropriate for the strategic case.

With respect to the complexity of the appraisal system, we recognise that the expanding range of impacts which are encouraged or required to take account of could push us away from the proportional approach that the DfT is encouraging. We are keen to work closely with the DfT to help find the right balance.

People and Place: capturing the range of impacts relevant to transport policy today

3. *What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.*

This is perhaps the most interesting theme covered in the consultation document in terms of new empirical research, and we see value in most of the work being proposed.

One of our priorities is the improvement of the way in which we capture safety impacts, covering both the re-estimation of the Value of a Statistical Life and the explicit inclusion of accident reliability impacts within safety appraisal.

Beyond that, our current focus is on valuing aspects of journey quality and customer experience, which are largely outside the available empirical toolkit. We have previously conducted pilot work to assess the willingness to pay for various elements for surface quality (including surface roughness, drainage, signage, road markings, presence of litter and debris and surrounding planting and vegetation). We are currently conducting primary research in this area. We have also recently initiated new research into the value of information, the value of road layout and the value of consistent operating conditions. DfT is involved in the Steering Group for this work and we hope that, in due course, the results can be incorporated into WebTAG.

Our third priority would be other aspects of wellbeing, specifically landscape/environmental impacts and Quality of Life methods. The evidence available to monetise landscape and several other environmental impacts is limited and often site-specific. We would see value in

the development of a set of values, possibly based on a mix of existing evidence and new primary research, which were capable of being applied to typical road projects more generally.

With respect to Quality of Life, we are currently doing some pilot work in this context, which we would be prepared to share to push forward the development of this area.

It is felt that valuing the attractiveness, particularly of the urban realm, should be a DfT priority. Research into this area would allow the future formulation of mechanisms to capture scheme impacts on the nearby urban conurbations. Highways England and the DfT are in the process of commissioning research into Social Impacts with the aim of identifying opportunities to strengthen existing guidance and help inform further targeted research to assist in developing guidance in areas where research and guidance is less mature.

Reflecting uncertainty over the future of travel

4. *What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.*
5. *What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?*

One way in which we believe WebTAG could be easily simplified would be by removing, or softening, the distinction between established, evolving and indicative impacts. The current approach creates the false impression that some impacts can be estimated with absolute certainty whereas others are based on entirely spurious methods. In effect, we have a duty (set out in both WebTAG and the Green Book) to consider all impacts that are relevant and material to a project. Downgrading some impacts creates the impression that these impacts are not there or somehow should be dis-regarded by decision makers which could lead to bias decisions.

Turning to the issue of predicting future travel, we agree that it is important to understand whether, why and to what extent secular trends may be changing. However, we believe that there are significant limits on how far we can resolve this question in the short term and amend our detailed forecasts accordingly. We feel that perhaps a more effective way to cope with this issue is by accepting that there is a higher degree of uncertainty in our long range forecasts than we typically assume and to test the robustness of investment decisions (in particular, value for money assessment) to alternative, extreme versions of the future.

We support in principle DfT providing additional evidence on parameter ranges and confidence intervals. However, using these ranges in practice is likely to require a substantial number of additional model runs, when resources are already stretched. We would prefer instead to use a small number of scenarios, which we think can provide much of the same information and are more straightforward to implement.

We are supportive of additional guidance on sensitivity testing and switching values, which we sometimes already use in our advice to decisions makers. We also see value in an uncertainty toolkit and would find case studies especially useful. The DfT could provide guidance around acceptable confidence intervals for use in the various scenarios.

The consultation document proposes new work around optimism bias. This is of limited value to Highways England, given that our treatment of cost uncertainty in appraisal is based instead on

an exhaustive quantification of risks, which is the proposal recommended in the Green Book and in other Treasury documents. However, we find that this is one area where there is sometimes confusion between the guidance in WebTAG (with a greater emphasis on optimism bias) and Highways England's approach (based on a quantified risk assessment). The difference, and relative merits of these approaches, would benefit from being explored more clearly in the WebTAG unit on costs¹.

Other sources of divergence between the Highways England approach and WebTAG are the estimation of maintenance/renewals costs and inflation. We are starting work on a technical annex to our appraisal manual, which intends to clarify some of these issues and which we will be able to share with DfT in due course.

Modelling and appraisal transformation investments and housing

6. *What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.*
7. *What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?*

Highways England has been using the dependent development guidance as a matter of course for evaluating Growth and Housing Fund schemes, as well as for a number of major projects with a material dependent development component. We put this information before our decision-makers, who we believe find it useful, and we would strongly encourage the DfT to fully adopt this type of evidence into its value for money metrics. One specific gap in this toolkit is the lack of detail around property valuations, for example in the case of commercial developments. We would find it useful if DfT and MHCLG were able to widen the range of developments, location types and regions for which this information is available.

The treatment of transformational development over an extended period is potentially problematic. The majority of the development is likely to extend beyond existing local planning periods and possibly beyond that of NTEM. We would be keen to assist the DfT going forward to decide on how these are treated within both WebTAG and the Highways England Appraisal Manual as transformational developments are likely to have major impacts on the SRN.

Turning to the notion of transformation investments, we see as essential the development of a clear definition and support the proposal to develop a commonly agreed framework to 'help build knowledge about how local economies work', including, amongst other things, consideration of household and business location decisions. Highways England has been working on an 'Economy Model' that attempts to do precisely that. In our view, it is vital for DfT to steer the debate at the risk of stakeholders spending a lot of time and energy on work that fails to meet government's burden of proof.

At a more detailed level, it is not clear to us that ever more complex models are the way to resolve the fundamental conceptual constraints of the transport appraisal framework. Simpler methods of discussing and measuring economic impacts of transport infrastructure may in fact be more appropriate.

¹ Although not linked to uncertainty, we find that treatment of costs (including construction cost inflation, portfolio risk and maintenance/renewals unit costs) is a frequent source of confusion in discussions with other scheme promoters. Some of this could be addressed through an update of the WebTAG costs unit.

We support DfT's effort to strengthen the sub-regional evidence base, for example by exploring inter-regional trade data, by re-estimating input-output tables or by generating regional and city-region GDP estimates, which are all a pre-condition for further in-depth research in this area. We are interested to understand whether improvements in longer distance transport links reinforce productivity in ways that are not already captured by existing methods (including through travel time savings and agglomeration). In addition to the specialisation route cited in the consultation document, modern trade theory also points to other potential mechanisms such as widening product variety, exchange of knowledge and withdrawal of lower productivity firms through exposure to competition. If these mechanisms can be shown to operate in practice, this could have a material impact on projects that seek to improve inter-regional connectivity.

Supporting the application of WebTAG and making it more user friendly

8. *What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?*
9. *What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?*
10. *How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.*

We agree that there is a balance to be struck between sophistication of analysis and a transparent, fit for purpose, system that is well understood by all. In our view, simpler is generally better unless where it is shown to bias decisions, either by mis-representing the value for money of a given course of action, or by leading to a sub-optimal option or scheme to be chosen.

The DfT has been successful at making the transport appraisal framework more transparent without losing its effectiveness and rigour. This has been achieved in large measure by emphasising the primacy of a proportionate approach to appraisal. We see value in DfT continuing along this course.

We also see value in continuing to develop the evaluation evidence base, including through case study material. We believe that this can help decision-makers strengthen their trust in the appraisal system. Case studies in particular can also serve as a valuable capacity building resource. Transport appraisal is a specialised area of analysis that can often be opaque to the novice analyst. Example applications can help analysts quickly get up to speed with best practice and common pitfalls. 'How to' guides are likely to be helpful for the same reason.

One area where WebTAG could be improved is the use of appraisal which goes beyond WebTAG, not in contradiction, but using areas WebTAG does not cover. We feel WebTAG should explicitly welcome the use of innovative evidence-based approaches in these cases where they are within the 'spirit' of WebTAG and held to a rigorous standard. There is an argument to be made that WebTAG should also give consideration to the use of tools such as microsimulation and junction modelling within appraisal.

While it is understood WebTAG is intended to be flexible, some existing key documents read as very prescriptive. For example, the guidance for the Senior Responsible Office is very focused on the need for a robust appraisal and implies there is not much room for flexibility or innovation. We would suggest that the guidance is revised to bring any flexibility to the fore.

We find that the area most prone to misunderstandings and misinterpretations is wider economic impacts, in particular the estimation of agglomeration and labour market impacts. This stems in part from the complexity of the equations that are recommended in the guidance and the fact that the underlying arithmetic follows a very different logic to that of user benefits. We would welcome the opportunity to discuss and develop this area with you.

Turning briefly to DfT-sponsored models, we would encourage the Department to strive to make the National Transport Model, and underlying tools such as the GB Freight Model, more transparent, for example, through the publication of detailed documentation.

Developing modelling and appraisal tools that meet user needs

- 11. What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.*
- 12. How can we best encourage innovation whilst maintaining a consistent and robust approach?*
- 13. What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?*

We support further advice on scenario analysis but would emphasise that this needs to avoid creating unnecessary complexity. For example, a simple set of extreme scenarios is likely to be sufficient if the objective is to stress-test a given course of action.

There is also likely to be value in developing simpler approaches to option sifting as well as robust rules of thumb that can guide early stage appraisals. Any type of approach should help simplify appraisal rather than be used to introduce unnecessary complexity.

There is strong support for the WebTAG databook both within Highways England and across our supply chain.

We are supportive of best practice guidance on matrix building using emerging data sources.

We agree with all recommendations on evaluation, which our in-house Evaluation team is looking to implement at Highways England.

We also strongly support any effort to make existing freight modelling tools more visible and transparent, and to improve our ability to replicate freight movements and to forecast freight demand. There is a clear role here for DfT in improving existing administrative data sources and our recent Freight Demand Scoping Study recommends several concrete actions. Highways England currently has plans to collect LGV data and to work with a small number of freight operators to explore how their operational data could be used to improve our understanding of the composition of traffic using the Strategic Road Network. We will share findings with the Department.

A key issue with some of DfT's sponsored software is run-time. Variable demand, for example, can take days to run for typical models, which makes for a substantial source of cost and is a bottleneck in scheme development. We would encourage the DfT to look at software and hardware solutions, as well as any changes in the underlying models, that could help address this problem.



It is not clear what the value of activity-based models is in a practical appraisal context. These models are complex to build, difficult to calibrate and expensive to run and so it is difficult to see how they would improve investment appraisal.

It is trusted the above provides our views on the direction of the DfT's transport appraisal and modelling strategy. We welcome this consultation and look forward to continuing to work with you to develop transport appraisal.

Yours faithfully,

Steve Elderkin

Chief Analyst, Highways England



Background.

Historic England is the Government's statutory adviser on all matters relating to the historic environment in England. We are a non-departmental public body established under the National Heritage Act 1983 and sponsored by the Department for Digital, Culture, Media and Sport (DCMS). We champion and protect England's historic places, providing expert advice to local planning authorities, developers, owners and communities to help ensure our historic environment is properly understood, enjoyed and cared for.

We welcome the opportunity to submit a response on the following points.

Priorities

- 1 Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?*
- 2 What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?*

These seem sensible themes (pages 21 and 22) – particularly “people and place”, although we also have an interest in “transformational investments and housing”, “WebTAG” and “modelling and appraisal tools”. See further details below.

People and Place: capturing the range of impacts relevant to transport policy today

- 3 What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.*

Valuing Attractiveness and Public Health and Wellbeing are our priorities. The historic environment is an important part of these themes.

From our perspective, priorities for improving the appraisal of places – such as landscapes – need to be improved. In this respect, progress is being made with some infrastructure schemes. For example the current A303 scheme's economic appraisal includes a comprehensive quantitative (monetised) appraisal of the heritage benefits of the proposed road scheme (“...an estimated aggregate net

present value of £1.3 billion (2016 prices and values) for the removal of the section of the A303 for a tunnel”). The decision to invest in the A303 was informed by a study that was able to quantify heritage, based on “contingent valuation” also known as “willingness to pay” methods. Increasingly there is a realisation that conventional indicators and accompanying models used to estimate value are not comprehensive on their own, and so are failing their objective of measuring societal prosperity. We strongly advocate new modelling and valuation techniques that more comprehensively demonstrate heritage value. Only then will we “do the right thing” for our generation and future generations to come with respect to the historic environment.

Whilst we welcome the use of “natural capital”, “ecosystem services” and similar concepts, we are nervous about techniques which only use a narrow or strict definition of these terms, as this might inadvertently exclude the historic environment from appraisals. “Natural capital” should be considered alongside the related concept of “cultural capital”. We hope there will be an opportunity to engage with any appraisal techniques which use “ecosystem services” in the future, when we are better able to represent the values of heritage assets in this framework, and for the inclusion of “cultural capital” when that is further developed. We are working on these areas at present, and the publication *Heritage Counts* (forthcoming Autumn 2018), will consider “Heritage and the Economy” in detail and will be a useful reference for these discussions. Please also see our comments below (at the end) on Landscape.

Impacts on the historic environment can be positive as well as negative, so it will be important to recognise benefits as well as risks. For example, these might include improved access, better settings and so on. These might be captured as gains if appraising “cultural capital”.

We use a number of approaches available for identifying and assessing the historic significance of present day landscapes or townscapes. They can be used singly or in combination, depending on the purpose, scope, and scale of a project and include:

- Historic characterisation, spatial planning and development
- Historic Landscape Characterisation (HLC)
- Historic Characterisation in Towns including the Extensive Urban Survey (EUS)
- Historic Area Assessments

Historic Area Assessments provide a full understanding of the historical development of an area such as a small town, suburb or village, or part of larger settlements. They set out to explain as well as describe, and to define the significance of these historic places. Details of this approach are set out in *Understanding Place: Historic Area Assessments*, published by Historic England, 7 April 2017.

We have set out more suggestions below in our section “General Comments”.

Reflecting uncertainty over the future of travel

4 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

5 What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these??

We have no comments to make on these questions.

Modelling and appraising transformational investments and housing

6 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.

7 What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

The transformational impacts of schemes should include the positive and negative impacts on the historic environment. See also our further comments below.

Supporting the application of WebTAG and making it more user friendly

8 What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

9 What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

10 How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance.

We welcome attempts to improve the accessibility of WebTAG. We also wish to see WebTAG fully aligned with the Green Book (see especially Appendix 2 of the Green Book), and placing more emphasis on well-being and non-use values. At present we feel there is a lack of social dimension in analyses, and that social prosperity and well-being need to be considered much more fully. WebTAG should also be aligned fully with the National Planning Policy Framework (July 2018) and the various Transport NPSs, in order to fully consider transport infrastructure and the historic environment (including off-site benefits and disbenefits, noise, vibration, etc). We would be happy to discuss all this in greater detail.

Developing modelling and appraisal tools that meet user needs

11 What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

12 How can we best encourage innovation whilst maintaining a consistent and robust approach?

13 What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

We have suggested some possible areas of improvement in our earlier comments, and comments below.

General Comments

You have set out three separate indicators in which we have an obvious interest (see the infographic in section 2.6, p15) – Landscape, Townscape, and Historic Environment. “Landscape” and “Townscape” clearly include historic assets such as Listed Buildings, Scheduled Monuments, Conservation Areas, World Heritage Sites, Registered Battlefields and Registered Parks and Gardens and so on, as well as other important sites, buildings and areas which are not designated or formally protected.

For example, the European Landscape Convention (aka the Florence Convention, 2000, which the UK has ratified) defines “Landscape” in Article 1 as “an area perceived by people whose character is the result of the action and interaction of natural and/or human factors”. (Please note this is a Council of Europe Convention not an EU one, and we will be continuing to use this definition). “Landscape” is therefore a complex of natural and cultural elements. It includes historic assets and the historic environment, and this historic element should not be forgotten when assessing it. We disagree with your infographic on this point, and believe it should be changed.

“Townscape” also clearly includes historic assets, some of which will be more historically significant and important than others. It may also include important areas such as Conservation Areas or World Heritage Sites.

Our major comment with the infographic and with your indicators is that it should be clearly understood that the “Historic Environment” is a cross-cutting theme.

Please also note that we use gender-neutral terminology and your “Historic Environment” section in the infographic might be better worded along the following lines: “The value of the surviving physical remains of past human activity.”

We hope that these comments are helpful; please do get back to us if you have any queries.

This response was prepared by Amanda Chadburn (Senior National Infrastructure Adviser) and Adala Leeson (Head of Social and Economic Research and Insight) on behalf of Historic England.

Immense Simulations Limited Responses to Consultation Questionnaire

The following section details our response to the questions raised by the consultation. The questions raised in the consultation are highlighted in **orange**.

2.1 Priorities

1. Do you agree that these themes reflect the most pressing priorities for development of our Appraisal and Modelling guidance? If not, what other themes do you think we should be exploring?

We broadly agree that the five key themes probably reflect the most pressing priorities for improved Appraisal and Modelling guidance. However, the UK is at the forefront of a transport revolution. Combustion engine vehicles are becoming electric vehicles with significant degrees of associated autonomy. Smart phones and rapidly improving communications (exemplified by the imminent arrival of 5G mobile communications) are allowing travellers to take better informed decisions before making planned multimodal journeys. The same technology is allowing travellers to make smart decisions should their current journey be severely disrupted.

So key modelling priorities would seem how best to model:

- the impact of emerging technologies (e.g. electric vehicles, connected autonomous vehicles, charging infrastructure etc); and
- the behavioural traits of travellers – how they behave in normal and abnormal conditions

2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18 24 months?

We recognise that WebTAG represents an important pillar of the Five Case Model (strategic, economic, commercial, financial and management cases) recommended by HM Treasury for transport business cases. However there seems to be a considerable misunderstanding in the transport sector as to its use and applicability. Some stakeholders will seek to obtain 'WebTAG-compliant' models from consultants (and other third parties) in the earliest evaluations of proposed schemes ... when the overall requirements and parameters of any scheme may be poorly defined and understood. In seeking to apply WebTAG in a naïve way, we believe potential beneficiaries of the analysis may be overlooking innovative ways to perform any modelling and to solve the transport question in focus.

Given that the DfT WebTAG guidelines have a significant impact on transport systems modelling in the UK, we believe that overhauling these represents the most important priorities for its strategy over the next 18-24 months.

Making WebTAG more user friendly

We welcome DfT's proposal to "to explore options to build capability by better signposting and communicating the guidance and developing case studies and other materials to help those using it." **We believe such signposting will be invaluable to enable inexperienced stakeholders to seek appropriate modelling advice and model development.** We therefore also welcome the DfT desire "to investigate options to streamline and simplify the guidance without affecting the overall quality of appraisal outputs."

Developing and maintaining modelling and appraisal tools to meet user needs

We believe that the DfT is right to remain open to innovations in transport systems modelling. We believe that future WebTAG guidance should be sufficiently flexible that new modelling methods can be easily adopted providing they can demonstrate a fit for purpose capability.

2.2 People and Place: capturing the range of impacts relevant to transport policy today

3. What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.

The DfT-funded "Keeping the West Midlands Moving" project (stakeholders: Transport for West Midlands(TfWM), Transport Systems Catapult and Immense Simulations Ltd) demonstrated the use of market research to verify the likely behaviours of travellers. We feel this work needs to be further developed so that the behaviours of travellers can be included in models.

We believe greater account should be taken in modelling the needs of people who may require some sort of assistance in travelling. The Equality Act 2010 brings an obligation to reduce the inequalities of outcome that result from socio-economic disadvantage. We believe this applies equally to transport policy. Particularly in respect of the protected characteristics of age and disability we believe that it is important to understand the needs are of the entire population and ensure that these are reflected in any model.

From a technical perspective, we believe it strengthens the case for any transport demand-model more accurately to represent the segmentation and diversity of cohorts of the overall population. Currently segmentation may be restricted to 'traditional' nine to five commuters, off-peak and weekend travellers – with members of each segment being treated in similar aggregated ways for modelling purposes. With the onset of intelligent mobility, traditional modelling approaches may not recognise that the capabilities attitudes of different cohorts in the population – both able bodied and travellers with protected characteristics.

An important factor over recent years has been a change in the daily commute pattern. For example, in Milton Keynes, street parking near offices is much more difficult on Tuesdays and Wednesdays. This reflects the change in the working-at-home ethos over the last decade. A lot of the models still nevertheless tend to be the average weekday which now never really happens. Having the ability to look over 24 hours a day 7 days a week would give a better analysis framework.

From a sensitivity perspective we believe that it is vitally important to look at the impact of disruptions. Many models assume that networks are running 100% effectively with a steady state load. But that's not really true. There are frequent (?always) major disruptions on the

highways network, many of which require active management by Highways England. Similarly, there are frequent incidents on the rail network. For example, the rail network has ~250+ suicides per annum which can close railways for 5/6 hours causing serious disruptions.

The need to model disruption suggests that more robust analysis on the reliability of the transport system may be one of the key things to analyse in the future.

In summary, we believe the three primary focus areas should be:

1. Understanding the segmentation of travellers;
2. Modelling the effects of disruption.
3. Greater provision for modelling elderly and disabled travellers; and

2.3 Reflecting uncertainty over the future of travel

4. What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.

We believe there are two basic approaches to modelling: a deterministic approach that describes where people and vehicles go (and at what speed) given certain assumed scenarios that affect the demand for transport and a stochastic (or statistical) approach that predicts the reliability of the journeys, and the availability of the network in statistical terms.

Deterministic models tend to be limited by scenarios people choose to look at and may not capture the innate feels of travellers about what they want to do. These models do not take into account the attitudes of the travellers.

Marrying the two basic approaches is far from a trivial task – and can demand lots of computing power. Even then, in the same way that it is impossible to predict when volcanoes will become active or erupt, there is still little or no chance of predicting when precisely disruption will occur. Nevertheless, once a disruptive event has been initiated it is increasingly possible to track its initial evolution and predict what might happen as a disruptive scenario develops ... with a view to mitigating its effect.

We feel that traditional transport systems modelling has tended to focus on deterministic models, and put bluntly, these can only be as good as their underlying assumptions coupled with the scenarios proposed for modelling. The current models tend to be infrastructure based. They can predict what happens across the road or transport network if the demand patterns change due to new developments, such as new estates, conurbations, trading and retail areas.

Analyses to date have been necessarily very constrained in the scenarios that have been modelled (due to computer limitations). This means that the impact uncertainty in modelling is often limited or not present. A very narrow view of the future is often taken in any appraisal, making best guesses and assumptions, running forecasts, and doing sensitivity testing around the base case, you take some elements out, but it assumes the trends we see continue instead of looking at what disruptive technologies might or could do. For example, what will happen if Mobility as A Service (MaaS) takes off?

Given the disruption currently occurring within the transport systems space, it seems likely that existing models will have limited applicability for the new transport paradigms (be they major infrastructure changes or innovative mobility services). Innovative schemes may not experience increase adoption of the services come on stream but create new opportunities as travellers identify alternative ways to make their journeys.

In summary, we believe the primary focus areas should be:

1. Understanding the attitude of travellers towards proposed significant changes in their journey – whether directly or indirectly affected; and
2. Introducing probabilistic scenarios and sensitivity studies into transport systems models;
3. Consider innovative ways of undertaking probabilistic risk assessment (look, for example, to aerospace, chemical, or nuclear for possible approaches to adopt).

5. What do you see as the main challenges to adopting a more sophisticated approach to uncertainty in Business Cases and what suggestions do you have for overcoming these?.

Complexity. Applying detailed cost models on top of transport systems models seems likely to be very difficult. Capital and operating cost data can be difficult to obtain at the best of times. As data driven agent- and activity-based models evolve, we believe that it will be possible to add in stochastic and cost data ... but this is likely to be an activity hamstrung by a paucity of open and trusted data.

2.4 Modelling and appraising transformational investments and housing

6. What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? Please select up to three.?

Modelling of housing development locations, sizes and impact tend to be in constrained geographies and bounded by the council authority that is promoting such developments. In some respects, any analyses performed may be blind to what is happening over any adjacent border. We believe it is important to have appropriately scaled analysis that extend beyond the immediate area of interest. These may be more regional, super-regional or even national to account for developments and changes to infrastructure beyond any authority boundary. In this way, we can minimise the risk that adjacent authorities are operating within their own silos – believing themselves to be developing independent schemes which may in fact be interdependent.

In summary, we believe the primary focus areas should be:

1. To knock down any silos between neighbouring authorities and their suppliers to encourage an open way of working together to looking at future developments; and
2. Encouraging stakeholder authorities to develop models that stretch beyond their immediate area of interest, and which can model the current build environment –

and capable of relatively easy extension to more easily look at future scenarios without the need to model these in the greatest of detail at the concept stage.

7. What transformational impacts do you currently find it difficult to represent in a scheme appraisal? What are the barriers to their inclusion and how would you suggest these are overcome whilst maintaining a consistent and robust approach?

We represent a creative team. In principle, we don't believe there are many technical barriers to developing models of real-world systems. They are, after all, only representations of reality. We are equally comfortable with all manner of data (open and public, closed and proprietary, historic and live) and data visualisation techniques, coupled with advanced methods such as artificial intelligence (AI) and discrete optimisation methods.

Where we (and others) may struggle is proposing an innovative approach to tackle a proposed scheme (especially if it is in any of the domains of electric vehicles (EV), connected autonomous vehicles (CAV), Intelligent Mobility (IM) or Mobility as a Service (MaaS)). The commissioning stakeholder may feel that they cannot accept such an innovative approach because it may fall outside the current WebTAG guidance.

One example that comes quickly to mind is the imminent rollout of 5G mobile phones that offer huge data limits. Pundits speculate that the 5G network could provide the connectivity infrastructure and base stations for CAV operations. That may well be true in major conurbations in the south, but will it work sufficiently reliably in the Highlands and Islands of Scotland? Other emerging themes include: autonomy, connectivity, electrification and shareability. The current widely-used toolsets in industry do not allow people to assess the impact of any of these emerging disruptive technologies. We doubt that current WebTAG guidance can be adequate in such circumstances.

Another challenge topic comes in trying to understand and model multimodal journeys. Traditionally there has always been a big focus on highway as that has always been the main mode. Industry still tends to do its analysis in that way. The current set of multimodal models tend to be car bus rail. They do not show the full variety of transport modes. Currently the analysis of how people would use a mobility hub would likely entail separate highway and public transport assessment and take a leap of faith that they join. It is our belief that the whole modelling framework needs to be a lot more integrated.

Without investment in relatively small, creative agile teams evaluating such developments and proposing innovation it seems likely that creativity could be stifled. We're very open to the idea of innovation hubs and competitions that promote innovative approaches, such as those operated by some local and regional transport authorities. We would welcome such signposting in future WebTAG advice.

2.5 Supporting the application of WebTAG and making it more user friendly

8. What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?

We recognise the importance of WebTAG in determining approaches to modelling systems. However, we also believe (and it is our professional experience) that WebTAG overly

constrains the future developments because many people believe that if a project is not WebTAG compliant, it will not fly (gain approval). Perfectly reasonable models that demonstrate outcomes have been criticised for not being WebTAG-compliant. We believe that the signposting in WebTAG needs to be more explicit, about what is acceptable practice together with any limitations as to applicability.

Currently it is a very dry set of pdf documents, that focus heavily on the infrastructure business cases. Its primary focus seems to be the macro level and it doesn't really focus on the micro levels. It has been written around the current [transport] industry paradigm which is more focused around static models in a time when things are changing from a technical perspective both in the real world and in modelling).

The existing WebTAG guidance requires sensitivity tests and uncertainty logs, but they are primarily around infrastructure assumptions. In the transport industry (especially from a civil engineering perspective) talk of uncertainty tends to focus on hard infrastructure and if developments go ahead or not, rather than focussing on the change in people's attitudes or if different disruptive technologies are going to take off. With the evident drive towards personalised travel, the aggregate approaches of WebTAG and its underlying assumptions start to fail. This is where we need to promote other and new technologies within WebTAG.

The obvious current areas of innovation are CAVS and MaaS and that plays through to the later questions, which talk about what the industry should try to embrace and what we are doing for agent-based modelling across a wide area. The industry doesn't really do that, now; they tend to use static models. These are very constrained on multimodality so embracing agent- and activity-based modelling will enable different policies interventions to be tested which current models really struggle to do. We feel there needs to be investment and a regulatory perspective to recognise that these technologies are appropriate.

We believe that WebTAG should be extended to encourage innovation.

We further believe that the DfT may find it beneficial to run a number of workshops with interested stake-holders to review the WebTAG requirements for the future – with a view to gaining cross sector buy-in from key stakeholders.

9. What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?

One way around our perceived limitations of WebTAG could be to have more competitions: industry challenges that are commercially rewarding but will push industry to step up to the next level. These probably need to be driven from central and local government – as some of the tier 1 contractors and consultants have considerable commitments under existing framework agreements and may not have the bandwidth (or cost structure) to investigate the application of innovative schemes. Indeed, a contractor with a responsibility to deliver a major infrastructure development may find that it is a distraction to assess prospective innovative schemes with a limited and risking chances of progressing in the earliest days of evaluation.

We feel that industry would benefit an analysis framework that supports such a pathway. For our part, as an SME, we believe that if an initial commission does lead to a major infrastructure (or like) development, then we should continue to have a continuing role as a member of a consortium, rather than have our intellectual work being usurped by a successor or an

organisation higher up the supply chain. As a potential supplier we have to be careful to protect our intellectual property.

10. How can we improve the way in which WebTAG is presented? Why? We are particularly interested to hear about how we can improve accessibility and clarity of the guidance

We believe that the current set of PDF documents could be significantly improved by the creation of an online portal or website (possibly protected by a log-in) where in the WebTAG processes are drawn up in the form of a signposted roadmap – maybe with associated diagrams and photos to clarify the expected process flow through a complete analysis – be it a simple road improvement, a major infrastructure project or some sort of innovation project.

2.6 Developing modelling and appraisal tools that meet user needs

11. What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.

We believe that we have already provided recommendations for the priorities arising from consultation. In summary, these are:

1. As the consultation is about modelling and simulation we really believe that the primary focus should be in updating the current WebTAG advice for 2018 and beyond, with sufficient latitude to allow the implementation of innovative modelling and simulation schemes within a WebTAG framework.
2. Develop a better understanding the segmentation of travellers;
3. Modelling the effects of disruption.

12. How can we best encourage innovation whilst maintaining a consistent and robust approach?

We believe our responses above have partially addressed this topic. In short, we believe that the future in simulation and modelling revolves around encouraging innovation, e.g. having industry challenges, and more favourable procurement mechanisms to engage SMEs,

However, a critical component of any simulation is: access to good quality data, the absence of which severely diminishes the quality of agent-based models. Simulations are only improved by the amount of data you can have on a population. If the data is patchy and disjointed, it is difficult to know its true quality. There are some commercial vendors, but even then, you cannot be sure about the integrity of their data.

We believe there is a need for a trusted data clearance centre: a body where data must meet their independent quality standards would be incredibly useful thing. Analysts would then have confidence that good data is being used.

Another barrier to developing the best models is, of course, the skill shortage of sufficiently capable analysts. The industry is already short-staffed but if modelling becomes even more technologically complex it further reduces the number of available analysts. We feel the whole analysis supply chain needs to react and offer some of those tools into the industry. That could challenge the business model of how analyses are done. Part of the solution lies in training schemes and the rewards offered to analysts ... but we feel this is probably beyond the remit of the consultation

There is a clear requirement to develop modelling and appraisal tools that meet users' needs ('fit for purpose'). We feel that it is important to recognise that there are different types of users: from innovators wanting to test novel ideas through to people who are quite clearly tasked with creating a specific detailed business case.

In an environment where expertise is fragmented, and different simulation requirements exist, we believe that software-as-a-service offers a good business model for users without the in-house IT capability to install and download supported applications – with the main computer requirement being able to use a web browser to access cloud-hosted resources.

Finally, we believe that smaller organisations are more adept at generating new ideas but often lack enough financial strength to develop the ideas – or to shoulder all the risks from implementing new solutions. The top tier providers tend to be very large and have the strength but because of their size may not have the financial freedom to be innovative. We feel there needs to be better ways to encourage partnerships between small innovators and Tier -1 suppliers within existing frameworks. We feel that procurement frameworks need to change to enable easier engagement with SME community who have niche skillsets, yet who find it difficult to break into public authority arena because of the existing public procurement frameworks being so dependent on the tier one supplier. (Oxfordshire CC seem a good example of trying to tackle that with their innovation partnership. Maybe there needs to be more of those kinds of approaches to widen the supply chain.)

13. What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?

We believe that agent- and activity-based models are set to develop significant traction in coming years. Not only would they allow the mobility people and vehicles to be analysed, but they offer the prospect of associating behaviour characteristics to different cohorts within any study.