



Department  
for Transport

# Appraisal and Modelling Strategy Consultation Consultation Responses

Response 21-40

**Moving Britain Ahead**

The Department for Transport has actively considered the needs of blind and partially sighted people in accessing this document. The text will be made available in full on the Department's website. The text may be freely downloaded and translated by individuals or organisations for conversion into other accessible formats. If you have other needs in this regard please contact the Department.

Department for Transport  
Great Minster House  
33 Horseferry Road  
London SW1P 4DR  
Telephone 0300 330 3000  
Website [www.gov.uk/dft](http://www.gov.uk/dft)  
General enquiries: <https://forms.dft.gov.uk>



© Crown copyright 2018

Copyright in the typographical arrangement rests with the Crown.

You may re-use this information (not including logos or third-party material) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk)

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

# Introduction

In 2018 DfT consulted on priorities for a new appraisal and modelling strategy<sup>1</sup>, 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.

---

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

# Contents

Insight6  
Institution of Civil Engineers  
John Nellthorp  
Kent County Council  
Leeds City Council  
Liverpool City Region  
Local Government Technical Advisers Group  
Lord Bradshaw  
Midlands Connect  
Minnerva  
Mott MacDonald  
Network Rail  
Omega Centre  
Oxfordshire CC  
PA Consulting  
Peak District  
Phil Abbott  
PJA  
Rail Delivery Group  
RSSB







# **Transport Appraisal and Modelling Strategy Informing Future Investment**

## **Consultation Response**



<b>Author:</b>	A.E.Rae
<b>Last Revision Date:</b>	04/10/2018
<b>Version:</b>	1.0
<b>Classification:</b>	Restricted

## About Us

Insight6 is a UK research and customer experience specialist company. We have around 1,000 trained and regionally-based researchers and have delivered over 260,000 experience measurements since our inception.

Insight6 Birmingham (IX6B) has been working on developing several key areas of community engagement within the transport sector starting from within the West Midlands. IX6B have developed leading-edge programmes around multi-model experience measurements (such as PCEP) and experiences influencing transport development planning. This has included undertaking research aligned with HS2's Community Engagement Strategy and working towards several projects with the University of Birmingham, especially City REDi and the Birmingham Centre for Railway Research and Education. IX6 has also engaged with the transport industry's watchdog and is developing key experience programmes for the new Mobility-as-a-Service (MaaS) being rolled out.

## Consultation Background

The Department for Transport (DfT) has sought consultation with regards to the appraisal and modelling of future transport investments. We understand that the Government's Industrial Strategy and Transport Investment Strategy has shifted the policy focus towards rebalancing the economy, supporting the creation of housing and improving the experiences of the travelling public.

We have also noted that the quality of the journey experience continues to be a key policy focus for the Government, as outlined in the DfT's Single Departmental Plan.

The needs of transport users have changed since the last major review, especially around travel behaviour and the implementation of new technologies such as smart ticketing and Mobility-as-a-Service. There is now a strong need to better understand these changes and the impacts around them, as well as move from just service measurements to incorporating experience-based measurements affecting the individual and the community as well.

As this consultation will help influence the next five years of transport policy, we understand the need for any response to ensure that the major policy issues are covered, but also, it gives an opportunity for more extensive engagement activities and looking at fresh approaches in how to measure and model. We appreciate that balancing local and national objectives creates difficulties, but with the old approach which measured displacement it meant that the net economic impact was often zero.

Our response will not cover every question but will suggest areas that ensures any future modelling approach has, at its core, the individual's experience and community cohesion. This will help ensure outcomes that cover a wider scope than just satisfaction metrics of the service, such as punctuality, reliability, and environmental conditions. This review also gives the opportunity in extending the Value for Money (VfM) calculations and the economic outcomes which include productivity and the labour market.

*Q1. 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?*

## Priorities and Themes

The core priorities identified by the DfT include:

- People and place
- Future travel uncertainty
- Modelling and appraising transformational investments and housing
- Supporting the application of WebTAG and its user friendliness
- Developing and maintaining modelling and appraisal tools to meet user needs

We have a similar outlook to the core themes above, but our five themes are:

- **Communities and individual well-being** – looking closely at metrics around community cohesion, social exclusion, community engagements and microparticipation, quality of life, and community priorities. All of these can be measured and modelled around outcomes that can deliver returns on transport investments and measure impacts from transport policies.
- **Behaviours and technology** - this looks at metrics around local behavioural change and their drivers, the implementation of technologies and processes (e.g. Mobility-as-a-Service) and the measurement of outcomes from them, and the impacts on different population types (e.g. age and income levels).
- **Transformational investments** – this area would include similar items identified in the consultation document around housing needs and impacts, productivity, the labour market, broader social mobility impacts, and we would include educational impacts in terms of accessibility and opportunities relating to the transport investments being made.
- **WebTAG revision and usability** – this will be the same as the consultation document around continually developing and improving the appraisal guidance and developing its usability through simplification where possible. We would advocate for the introduction of scenario planning through the delivery of workshops and training events to help develop a best practice approach for users to refer to.
- **Developing engagements and the national modelling capability** – to ensure the model continues to be ‘fit for purpose’, the review of approaches and engagements should be given a broader view. This would involve extending the contributions from a wider range of academic, community and private sector influencers. We do not see this meaning only transport experts but a wider range of voices to give a much wider perspective. This will assist in how we better understand the impacts and benefits (including VfM) of new projects, initiatives and policies. Groups like the Joint Analysis Development Panel can then have information from the leading areas of technology to review such as ‘big data’, Mobility-as-a-Service and Smart Cities. Engagements with community cohesion experts and those able to demonstrate understandings on transportation impacts from the labour and skills markets would also form part of the stakeholder engagement process.

**Q2. What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?**

**Priorities for first 18 – 24 months**

The list is not supplied in order of implementation but over the stated duration:

1. Research and define a suitable transportation community cohesion model. This could include a custom weighting scale.
2. Research and define an activity participation model aligned with social exclusion.
3. Undertake some regional social capital research across specific area types like cities, rural etc.
4. Develop driver engagement guidance models that can be incorporated in implementation metrics for any passenger transport investment. This may require engagement exercises with operators to gather further feedback to find the optimal model.
5. Undertake a focus group of WebTAG users to test usability and accessibility features prior to roll-out.
6. Develop an activity-based transport model around uncertainty modelling.

**Q3. What should be our priorities for improving the appraisal of people and place and why?**

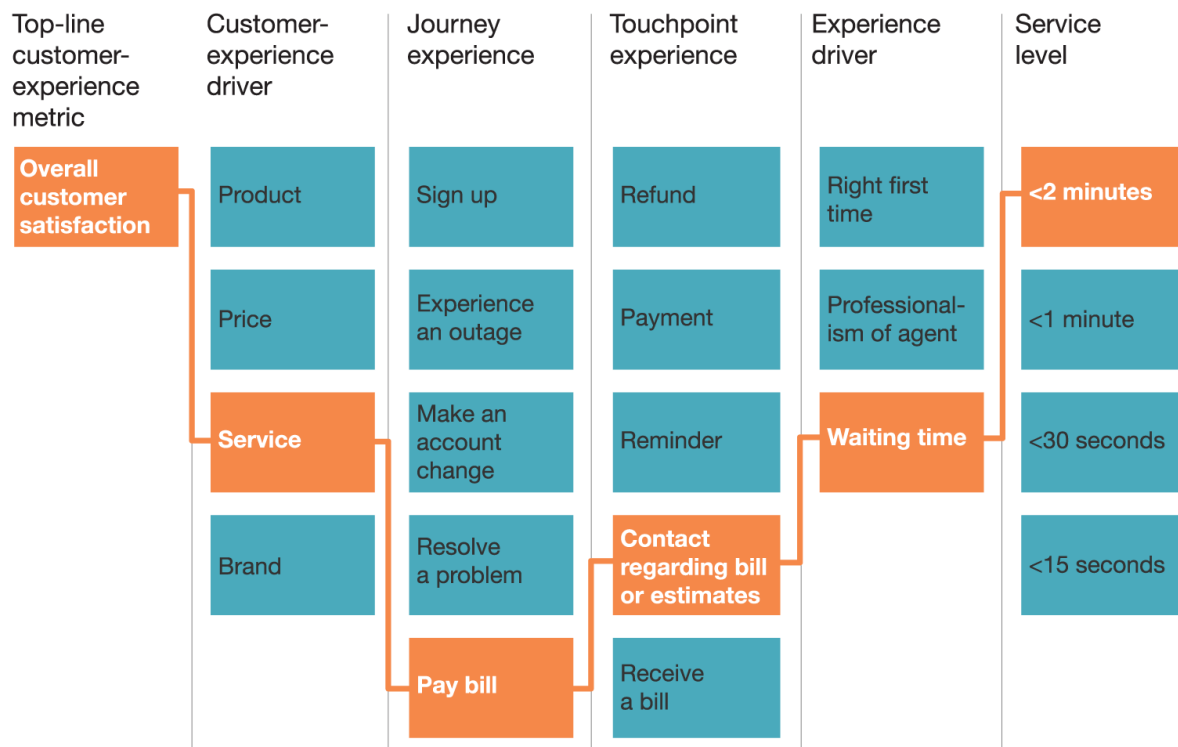
**Priorities for People and Place theme**

Our expertise is in engagements, experiences and insights. We strongly believe that there are three core elements that are critical for transforming a middling approach to customer-experience measurement into one that can deliver impact and create value.

1. Measure at the **journey level**, as opposed to looking only at transactional touchpoints or overall satisfaction.
2. Build into the modelling costs (based around technology) the capturing of **daily customer feedback** from multiple channels and integrate survey results, social-media posts, and operational data into comprehensive, role-specific dashboards. These can provide transparency and drive decisions at all levels. The past approach of data being in a silo across the different transport modes and providers will always impact and skew any results gained after modelling and appraising has been undertaken.
3. Instill a cultivation of a continuous-improvement mind-set at all levels. Any guidance supplied to organisations must help create the mechanisms to close the loop between frontline workers and customer feedback, then use the data to change the design and execution of the customer-experience process. This result will then help **improve the accuracy and certainty levels** of future models.

To demonstrate the type of holistic, integrated model being proposed; the example below shows how the various metrics could be linked at every customer experience delivery area, using a simple process of engaging a utility company as an illustrative point.

**Example: Linkages measuring consumer experience throughout call to a utility company**



**Priority One – Community Cohesion**

We believe that the core element to the theme of people and places is the **community cohesion**. This refers to the quantity and quality of interactions amongst people in a community and their participation in local services.

It is widely recognised that transportation and land use planning decisions can affect community cohesion by influencing the location of activities and the quality of the public realm (*places where people naturally interact, such as pavements, local parks and public transportation*). Therefore, this generates opportunities for neighbours to meet and build positive relationships. Having geographically close social connections can deliver its own unique benefits, along with the increase of mobility which has been the current primary focus.

The study done by the Project for Public Spaces (PPS) in 2016, concluded that people who have a **stronger sense of community belonging** tend to live healthier lives and have fewer mental health challenges than those with a weaker sense of belonging. Improved community design can improve **social capital, sense of community, and individual well-being**, including decreasing rates of depression and reducing levels of psychological distress. These all have direct costs associated with them for the government and the local services.

It has been shown that transport problems and poor planning can add social barriers to communities which worsens community cohesion and increases social exclusion. Therefore, well planned and delivered public transportation can directly support community cohesion. This is done by providing opportunities for people to interact, and indirectly by supporting more compact and pedestrian-oriented local development patterns. Through our own research, we have found the following areas that an appraisal model for the transport sector could help with:

- Attract a broader cross-section of community members through high quality public transport services (e.g. convenient, comfortable, secure and affordable).
- Comfortable and quiet public transport vehicles which can help facilitate conversation.
- Comfortable waiting areas (e.g. at train stations and bus stops) which can increase the positive experience significantly.
- Align the investment with marketing and promotional programmes to emphasise the community benefits of using public transportation.
- Help drive transformative change to any current and future transport-oriented development. This includes how stations are transformed into community hubs, and also generate emphasis on compact, mixed, pedestrian-oriented developments.

This type of approach helps to ensure a wider set of outcomes are delivered, rather than what has been focused in previous transport investments models. Examples of what outcomes could be reflected in future appraisal models include:

- Increased accessibility to employment.
- Increased accessibility to learning opportunities.
- Larger exposures to other community members and divergent groups.
- Increased mobility for those members of the community restricted by poor health or financial reasons.
- Provide incentives for being able to visit family and friends via public transport.
- Connecting communities with transport organisations and their stakeholders.
- Promoting a 'community spirit' and identity.
- Increasing volume opportunities for local businesses.

How community cohesion is measured has been researched across many countries like Australia, US and the UK. Traditional models have favoured mobility measurements over local accessibility, along with automobile travel over alternative modes such as walking, cycling and public transport. However, we feel that shift is now happening as more and more, the focus on experience and community engagement has taken a lead role, for example with the HS2 community engagement strategy.

The core to any community cohesion model appears to be around measurements based on terms of **trust and participation**. We have seen that departments such as the Homes and Communities Agency (now Homes England) developed its own measurement tool - the Cohesion Index to improve the understanding of cohesion and the factors that contribute to cohesive communities. That index considered over 60 indicators - including but not limited to – demographics, types of crime, employment, education and pressures on public resources such as housing waiting lists and rapid population change. The Government also introduced in 2018, The Integrated Communities Strategy (MHCLG UK 2018) as a sign of the importance community cohesion is to the UK. However, with all

these tools and models being developed, the recent research and reports show that far from improving, segregation is becoming more ingrained, which damages any community cohesion.

There are many ways to develop models that consider the various factors for improving transport system diversity and affordability, whilst maximising on investments that promote community cohesion. We have done several pieces of work around this field but for the benefit of this consultation, our response is to suggest this fresh approach for building up the new appraisal model.

Some ideas for what the refined appraisal and modelling could incorporate are metrics around; **social capital and trust, well-being, social isolation and exclusion, and segregation and participation.**

With further work, a weighting system could be developed and aligned with the above which is then incorporated in the investment planning for any local or community-based programmes. This can then help more accurately measure the impacts and improvement on community cohesion across the regions.

## Priority Two - Social Exclusion

Social exclusion has been recognised for many years as a major factor that has deep connections with transport. Back in 2003, the Social Exclusion Unit (SEU) published a major report into transport and social exclusion, which recommended a new approach on accessibility planning. The study's recommendations focused on:

- The affordability and accessibility of transport services.
- Recognition that those on low incomes may also be less able to take advantage of cheaper bus or train fare deals which involve paying sums up front.
- Defining what 'transport poverty' is especially around car ownership, and real deprivation.
- Ensuring that any models consider that low income people within communities tend to have higher exposure to the negative impacts of transport. They also face greater risk of:
  - Being killed or seriously injured on the roads
  - Higher levels of air pollution leading to a greater risk of premature death
  - Lower levels of social interaction due to higher traffic levels affecting the level of contact between neighbours and others in the community.

In 2016, the MDPI published the paper "*Measures of Transport-Related Social Exclusion: A Critical Review of the Literature*". This paper examined issues surrounding the transport dimension of social exclusion. There are many factors included in social exclusion (e.g. poverty and politics), but transport does deliver significant impacts on issues surrounding social exclusion such as being able to reach essential opportunities. Several studies have demonstrated that a lack of access to transport results in poor access to goods and services and consequently leads to social exclusion. As a result, a key priority for undertaking



transport investment proposals requires models that can take into account the needs of those who are “transport disadvantaged” in order to **reduce transport-related social exclusion**.

This then leads into what criteria could be contained in any model to firstly capture the issues and then understand the transport disadvantage measures. From the MDPI paper, the issues appear to break down into the following three areas:

- Spatial (e.g. urban accessibility, and public transport accessibility).
- Temporal (e.g. public transport availability, and facility opening hours).
- Social attributes of travel and activity participation (e.g. personal mobility, and disability).

The transport disadvantage measures break down into four key measurements:

- Deprivation-based measures.
- Mobility-based measures.
- Accessibility-based measures.
- Activity-based measures.

From previous transport models, it does appear that the first three categories of measures have been used to identify transport disadvantages but did not fully consider the issues surrounding **activity participation**—the key outcome of social exclusion. Participation in an activity means that an individual has overcome the spatial, temporal and social barriers of travel for that activity. The 2016 MDPI research showed that there was a significant lack of understanding and measuring of individual travel and activity participation. As with a lot of transport data, all the activity indicators (e.g. qualitative/quantitative aspect of travel and activity participation) have been treated in isolation when identifying transport disadvantages and consequently transport-related social exclusion. For a model, it needs to encompass key questions such as:

- ✓ Does the measure use a socio-economic disaggregated approach (disaggregation of socio-demographics)?
- ✓ Does the measure assess accessibility of different types of opportunities (spatial accessibility)?
- ✓ Does the measure assess accessibility of opportunities temporally (temporal accessibility)?
- ✓ Does the measure assess accessibility of transport spatially (spatial mobility)?
- ✓ Does the measure assess accessibility of transport temporally (temporal mobility)?
- ✓ Does the measure model interactions between different causal factors (interaction)?
- ✓ Does the measure consider the activities of others living in the same area (relativity)?

Summary of review of Transport Disadvantage Measures						
Transport Disadvantage Measure	Criteria Used for the Evaluation of Transport Disadvantage Measures					
	Socioeconomic disaggregation	Spatial disaggregation	Temporal disaggregation		Interaction	
	<i>Did the measure use a socioeconomic disaggregated approach?</i>	<i>Did the measure assess accessibility of different types of opportunities?</i>	<i>Did the measure assess accessibility of transport spatially?</i>	<i>Did the measure assess accessibility of opportunities temporally?</i>	<i>Did the measure assess accessibility of transport temporally?</i>	<i>Did the measure model interactions between different causal factors?</i>
Process-based / Area deprivation	Partly	Yes	No	Yes	No	No
Area accessibility	Partly	Yes	Partly	No	No	No
Area mobility	Partly	No	Yes	No	Yes	No
Outcome-based / Personal mobility	Yes	No	Yes	No	Yes	No
Individual accessibility	Yes	Yes	Yes	No	No	No
Participation-based	Yes	Yes	Yes	Yes	Yes	Yes

When looking at the mental health outcomes from social exclusion, Zammit wrote in 2010 a paper entitled, “*Individuals, Schools, And Neighborhood: A Multilevel Longitudinal Study Of Variation In Incidence Of Psychotic Disorders*,”. This found that people who experience social exclusion at a young age, such as moving into a new community at ages between 8 and 16, experience mental stress.

As we have previously stated, our view is that any transportation investment can impact on multiple areas of social exclusion, and that includes how young people are engaged and motivated to utilise public transport and services.

This can be incorporated into a participation-based metric to not only identify transport disadvantages by assessing the levels of participation across different activities, but it also helps in identifying the exclusionary outcomes such as a lack of participation in certain types of activities, such as by young people. In addition, the two measurements, **individual accessibility** and **participation in activities**, together, facilitate a link for investigation between the types of opportunities available and the types of opportunities participated in. This consultation response therefore suggests **operationalising all three measures** associated with the activity-based measures (e.g. individual accessibility, personal mobility, and participation in activities).

Further work needs to be performed around understanding the travel behaviour and the application of activity-based measures. Our work is looking at fresh approaches in community engagement which will encompass social exclusion as any current appraisals and models are still very limited in how they help identify transport-related social exclusion.

### Other Potential Priorities

Another potential priority for this theme could be **Universal Design**. This refers to facility designs that accommodate the widest range of potential users, including people with mobility and visual impairments (disabilities) and other special needs. Although Universal Design standards address the needs of people with disabilities, it is a comprehensive concept that can benefit all users.

For the purpose of modelling, we suggest the following key measurement areas are included:

- Review of standards for pedestrian facilities, public vehicles and other transportation services adopted by the local authorities and government organisations.
- Special projects and funding to reduce barriers and upgrade facilities to meet new accessibility standards.
- Development of multi-modal access guides, with maps and wayfinding information to a destination. This could include availability of public transport and taxi services and the quality of walking conditions. This could take the form of an app or connected apps.
- Measuring the benefits of transport mobility and the impact on quality of life.

Another potential factor to look at in the model would be around **Social Capital**. This describes the advantage individuals and communities can gain from social participation, mutual assistance and trust. The provision of travel options for those who are socially disadvantaged is a major reason for providing public transport. Whilst there has been recent work on how transport can address social exclusion, Social Capital has been overlooked.

We know from our research that those living in 'removed' areas (e.g. locations distant from main roads and/or bus routes) are more likely to own vehicles and make a higher proportion of their journeys by car. Affluent households enjoy higher levels of car ownership and make more journeys over greater distances by this mode than those on lower incomes. Less affluent households are also more likely to have disposed of a vehicle without replacing it, suggesting a more fluctuating dependence on the car.

This means that the **low-income families can lack Social Capital, mobility and accessibility**. Public transport can provide mobility for this group and, in doing so, provide a greater opportunity to create social networks, trust and reciprocity. Although these concepts are abstract, plausible links have been identified between the concepts of enhanced positive social interaction associated with the 'liveable city' concept and those engendered in Social Capital theory. Public transport, by definition, involves travelling with others and hence provides opportunities for social interaction while travelling, as we have mentioned within the community cohesion section.

It is worth noting that we see a lack of quantitative primary research associated with measuring Social Capital and this may be something that the DfT would consider undertaking further. We believe more in-depth measurements around the influence of improved mobility options on Social Capital in disadvantaged communities would be a worthwhile research area. With a new model, there is an opportunity to better understand how **public transport acts to address social disadvantage, through the provision of mobility to disadvantaged communities**.

The final area of priority suggestion comes around **driver engagement**. We see this as a regional metric that is multi-modal and is an activity that can **help reduce impacts and increase public participation rates** on transportation.

IES performed an attitude survey of 10,000 participants in the NHS and delivered the core measurement headlines which can be used in any engagement model. These being:

- a positive attitude towards, and pride in, the organisation.

- belief in the organisation's products/services.
- a perception that the organisation enables the employee to perform well.
- a willingness to behave altruistically and be a good team player.
- understanding the bigger picture and a willingness to go beyond the job requirements.

From that survey it has enabled the development of models that can be used in future appraisal and guidance linked to transport investment. Within the delivery phase of the project, engagement must be embedded within the project's culture as that ensures without additional capital expenditures, the positive outcomes are maximised. The areas that would need including in the engagement part of a model are shown below and how they feed into the engagement process. This model includes what needs to be delivered internally in order to deliver excellence externally.



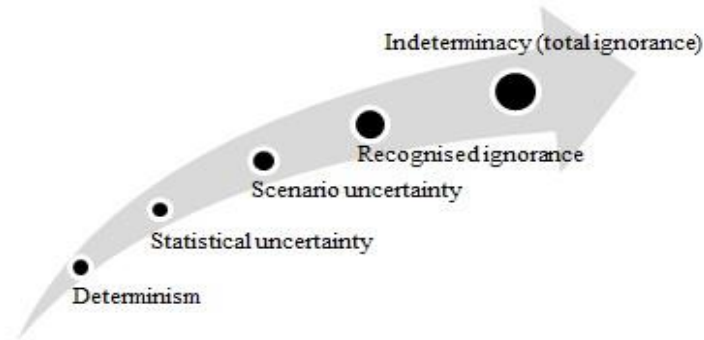
#### *Q4. What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why?*

##### **Reflecting Uncertainty in Future Models**

There have been many reported examples that transport projects and policy evaluations are often based on transport model output, e.g. traffic flows and derived effects. Past models have delivered a wide variance between forecasted and observed, especially within traffic flows. To reduce any socio-economic losses from unoptimised public funding allocations, there is an opportunity to look again at how uncertainty in transport models and forecasts are calculated.

The key in starting to assess this inherent uncertainty is to look at what are the **main sources of uncertainty within the model, how uncertainty propagates throughout the model** and, finally, **how it affects the model output**.

Our modelling of uncertainty is derived from the 2003 paper by Walker et al. This paper helped develop an understandable scale/level of uncertainty as shown below:

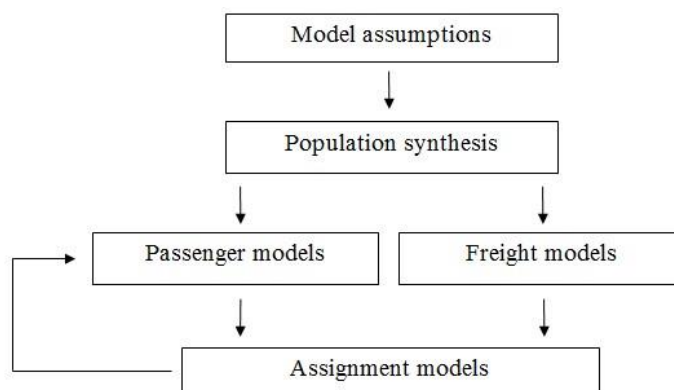


This diagram shows the three main increasing levels – **statistical uncertainty**, **scenario uncertainty**, and **recognized ignorance** – bounded between determinism and indeterminacy. With respect to the bounds, both determinism and total ignorance lie outside the range of uncertainty. While determinism excludes uncertainty by definition, the reason why total ignorance is excluded from the range of uncertainty as well, is that uncertainty is not related to what is totally unknown but refers to something that is not entirely understood.

Both epistemic and ontological uncertainty affects transport models at statistical, scenario and recognised ignorance level. This then covers the model’s inputs, parameters, events (*where no probability of occurrence can be defined which therefore, means a probabilistic analysis cannot happen*) and any related major or unpredictable changes in the system environment (e.g. technology breakthroughs).

Our approach when looking at priorities to uncertainty modelling is to understand where it will be used and the characteristics of the situation. Our model preference tends to be closer to an **activity-based transport model**, such as NTM. These models tend to fit into a larger national scale requirement as it has characteristics of wide and composite infrastructure (*required for the link-based speed-flow curve parameters uncertainty analysis*), the in-depth role of the socio-economic variables (*required for the model forecasts uncertainty analysis*) and the presence of an integrated land use model (*required for the uncertainty in spatial composition analysis*).

An example of the NTM framework is shown below.



At the initial stage, the model assumptions exogenous to the model, such as demographic, household, employment levels and transport networks, are defined. Then, in the step called population synthesis, a population matrix is created. Afterwards, the model consists of two parallel segments: the passenger demand model and the freight demand model. These models feed the assignment models which define the route choice equilibrium; this provides in turn feedback to the

demand models. As with everything, we look to ensure we capture the feedback and use this to help develop the model's accuracy and allow for changes.

*A much more detailed breakdown could be supplied if the DfT require it and this may help define the priorities of what would be needed in a review on how uncertainty is managed within the new model.*

## Summary

This consultation response delivers ideas and priorities to be incorporated into a refined appraisal and model the DfT aims to develop when looking at transportation investment. We focused on our expertise which covered the themes of 'People and Place' and 'Future Travel Uncertainty'.

We outlined our views on the themes and listed the key measurement and modelling priorities we see as vital in how transportation funding develops. Those being:

- ✓ Community cohesion
- ✓ Social exclusion
- ✓ Universal design
- ✓ Social capital
- ✓ Driver engagement

All of these metrics have inter-connectivity to each other and although they each need defining (*including researching further*) and measuring, all have the ability to influence and maximise on each other. **Community** is now a key theme for transport and it is being recognised more and more as an important measurement alongside the traditional ones of safety and service. Our view is that any new model needs to reflect this and give its users the **regional flexibility** to adapt and refine for it for their area.

## Further Information

We are happy to supply further details, assistance with research and insights into our response using the contact details below.

Email: [andrew.rae@insight6.com](mailto:andrew.rae@insight6.com)

Mob: 07903 286032

Email: [stuart.plant@insight6.com](mailto:stuart.plant@insight6.com)

Mob: 07826 869121

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

ICE is pleased to respond to the Department for Transport's consultation *Transport appraisal and modelling strategy: informing future investment decisions*.

This consultation coincides with ICE's exploration of the inclusive cities agenda through ICE Thinks, our thought leadership programme. This has comprised a conference in February this year, *'What is the city but the people? the role of the engineer in creating inclusive cities'*, which brought together engineers, industry leaders, parliamentarians, urban designers, students, academics, disability groups, artists and dancers to examine what makes a city truly inclusive.

ICE's subsequent paper,<sup>1</sup> argued that value for money and the traditional use of cost-benefit analysis should not undermine the fundamental ideal of creating a better, more sustainable society with infrastructure that is fit for purpose, for all. The importance of thinking inclusively to improve outcomes for the users of infrastructure cannot be understated. Inclusivity is not a buzzword; it has a real impact on real lives.

As such, this response focuses on the consultation's theme of People and Place: capturing the range of impacts relevant to transport policy.

## About ICE

Established in 1818 and with over 95,000 members worldwide, ICE is a leading source of expertise in infrastructure and engineering policy and is widely seen as the independent voice of infrastructure. ICE provides advice to all political parties and works with industry to ensure that civil engineering and construction remain major contributors to the UK economy.

## Key Recommendations

Transport infrastructure, in particular, plays a significant role in shaping people's everyday lives and contributes to the range of productive opportunities that are available to them.

If the main objective of the Industrial Strategy is to improve living standards and increase productivity, and the Department's appraisal and modelling techniques are to support this objective, ICE believes that the strategy should:

- Account for the reality and diversity of everyday lives, as shaped by factors such as age, race, gender, physical/psychological ability and socio-economic background, giving equal consideration to direct users and indirectly affected groups.
- Broaden the concept of productivity beyond paid employment and traditional measures of economic output.
- Fully consider a range of direct and indirect outcomes, including the likelihood and potential impact of each scenario.

## The reality and diversity of everyday lives

Ultimately, the success of investment decisions and transport schemes should be assessed by their practical, everyday utility. The sector currently places too much emphasis on the economic case, and this reliance on quantification has the potential to stifle good projects. While the quantification of costs and benefits may appear

---

<sup>1</sup> [ICE, \(2018\) What is the city but the people? The role of the engineer in creating inclusive cities](#)



objective, investment decisions can never be truly neutral, and any attempt to do so often ignores the diversity of society.

Fundamentally, different people use and experience transport in different ways. For example, it is well-known that people with disabilities travel less and for purposes that are different to those who do not have an impairment. However, the type or extent of an individual's disability is often more important in explaining their travel behaviour than the general characteristic of being disabled alone.<sup>2</sup>

Inaccessibility has personal costs on disabled people's day-to-day expenditure. For example, 'the cost of taxis in lieu of inaccessible local public transport systems' can mean that "once disability-related costs are taken into account the numbers of households with a disabled occupant assessed as living in poverty jumps from 23 per cent to between 40 per cent and 60 per cent."<sup>3</sup>

Many women also use transport differently to men, combining paid work with family duties, fragmenting where and when they travel.<sup>4</sup> A survey undertaken in Vienna during the 1990's showed that men's typical route was short and straightforward: often to and from work. Women's journeys tended to be more complex and varied, usually including multiple trips a day on the metro as well as on foot: dropping off children at school, going to the doctor, getting groceries, visiting an older family member, and then back to school for the pick-up.<sup>5</sup>

Men undertake nearly three times as many journeys by bicycle as women. Design choices, such as a shortage of safer protected lanes separated from the main road, can suppress the numbers of women who cycle; Transport for London's head of surface delivery planning suggested in 2015 that the overriding reason women cycle less than men is a fear for their safety.<sup>6</sup>

Diverse, lived experiences, if captured, could be a great source of knowledge to all those responsible for shaping the built environment, and instead of being reactive, planning and investment decisions should ask, in what kind of places we want to live.

When we look at plans and drawings at a 10,000:1 scale, it is easy to lose sight of this detail, and the individual people whose lives we are shaping. The same can be said when considering the net present value of an entire scheme.

Web Transport analysis guidance (WebTAG)<sup>7</sup> currently favours the improvement of travel patterns of business users and commuters, regarding their time as more valuable than others. In turn, this emphasises the need to make journeys faster, as opposed to giving people different travel options or increasing the frequency of services to allow for more flexibility. There is a risk that schemes whose primary benefits are these Level 3 (e.g. improved frequency of services), or non-monetisable impacts, are disregarded on this basis of their initial benefit cost ratio and value for money classification.

---

<sup>2</sup> Clery E, Kiss Z, Taylor E, Gill V. *Disabled People's Travel Behaviour And Attitudes To Travel*. London: Department for Transport; 2017. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/647703/disabled-peoples-travel-behaviour-and-attitudes-to-travel.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/647703/disabled-peoples-travel-behaviour-and-attitudes-to-travel.pdf). Accessed October 1, 2018.

<sup>3</sup> Wood C, Grant E. *Counting The Cost*. London: Demos; 2010. [https://www.demos.co.uk/files/Counting\\_the\\_Cost\\_-\\_web.pdf?1292598960](https://www.demos.co.uk/files/Counting_the_Cost_-_web.pdf?1292598960). Accessed October 1, 2018.

<sup>4</sup> Sassen S. Built Gendering. *Harvard Design Magazine* October 1, 2018.

<sup>5</sup> Fleming A, Tranovich A. Why aren't we designing cities that work for women, not just men?. *The Guardian* 1, 2018.

<sup>6</sup> Slavin T. 'If there aren't as many women cycling as men ... you need better infrastructure'. *The Guardian*

<sup>7</sup> Gov.UK Guidance, Transport Analysis guidance: WebTAG <https://www.gov.uk/guidance/transport-analysis-guidance-webtag>



To explain, a scheme that presents an overall benefit could, in reality, be making a minimal improvement to a large number of people, bearing in mind that a two-minute journey time saving on a 45-minute commute is almost negligible to the individual. That same scheme, whilst presenting a positive net present value for that reason could simultaneously be making some people vastly worse off, and in fact increase inequalities between travel options, or fail to consider the opportunity cost of alternatives which might have a net social value.

While the consultation discusses the monetisation of a broader range of social impacts and customer experiences, quantification may not necessarily be the most appropriate way to capture these benefits and may even be misleading or inaccurate. "A major problem in the planning of large infrastructure projects is the high level of misinformation about costs and benefits that decision-makers face in deciding whether to build and the high risks such misinformation generates."<sup>8</sup>

It is recognised that the operationalisation of public interests is challenging but capturing the nuance of different user needs calls for a higher degree of sensitivity. This approach may require a more site and group-specific methodology, which would need to be informed by a greater awareness of user needs concerning different life realities, as well as cultural and social backgrounds. For example, this could include the use of group-specific: requirement profiles; objectives; test questions and quality indicators. As a cross-sectoral issue, inclusive transport investment also highlights the importance of fostering interfaces between governmental departments and each level of planning and investment.

Digital services such as Citymapper and Google Maps have re-imagined the ways that we plan our travel. They can provide the public with live updates, straight to an app, regarding delays on the network, and offer a multitude of different route options based on comfort, accessibility, minimisation of changes, or even the avoidance of rain.

An analysis of WiFi connection data on London Underground revealed useful insights into how people criss-cross the city using the Tube. "The pilot revealed many results that could not have been detected from ticketing data or paper-based surveys. For example, the analysis showed that customers travelling between King's Cross St Pancras and Waterloo take at least 18 different routes, with around 40% of customers observed not taking one of the two most popular routes."<sup>9</sup> Many passengers choose not to take the most direct route, and instead plan journeys which suit them, whether that is based on travel time, crowding or walking distance.

This flexibility is made possible by redundancies in travel networks, which could be purposefully engineered to provide more inclusive travel options and to connect existing parts of the network better. The public's use of these apps provides new possibilities to understand and influence people's decision-making processes.

Appraisal tools should be updated to account for modern travel trends and fully exploit the potential of these technologies. These tools could also help to effectively prioritise transport investment to improve services and address regular congestion points, ensuring the maximum benefits to customers.<sup>9</sup>

## The Concept of productivity

Responsibilities as carers, by both men and women, are not recognised economically, even though unpaid carers provide social care worth £57 billion, and the unremunerated work of women, in particular, is estimated to equate to around 20-30% of a city's GDP.<sup>10</sup> This monetisable contribution to society is not accounted for in either WebTAG unit A2.1 - Wider Economic Impacts, nor A4.1 - Social Impact Appraisal.

---

<sup>8</sup> Flyvbjerg B. Policy and Planning for Large-Infrastructure Projects: Problems, Causes, Cures. *Environment and Planning B: Planning and Design*. 2007;34(4):578-597. doi:10.1068/b32111

<sup>9</sup> Transport for London. *Pilot Shows How Wifi Data Can Improve Tube Journeys*

<sup>10</sup> Sassen S, Pieterse E. Cities and Social Progress. In: IPSP, ed. *Rethinking Society For The 21st Century: Report Of The International Panel On Social Progress*. Cambridge: Cambridge University Press; 2018.



Radial transport networks primarily serve central business districts and more traditional white-collar jobs, satisfying Level 2 and 3 wider economic impacts. However, for people combining paid work with family duties, travelling multiple and inconvenient distances to access shops, schools, health services, and jobs, all entail a significant appropriation of their productive time.<sup>10</sup> Failure to factor this type of travel behaviour as part of transport investment decisions means that the productive contributions of unpaid labour are not sufficiently considered for their wider economic impact.

As discussed, if the primary objectives of the Industrial Strategy are to improve living standards and increase productivity, future investment decisions must broaden the concept of productivity beyond paid employment, and work to optimise the productivity of informal and unremunerated carers similarly.

Transport investment concerning decisions between compact or diffused cities and transport networks, or the impact of new, urban spatial fragmentation, must address specific identity-based exclusions and mobility patterns of the marginalised through “time-use” surveys and time-budget analyses.<sup>10</sup> Investment decisions that are more sensitive to the needs of those who have responsibilities as a carer will positively impact the lives of many working-age women, but also of a growing number of men, since the division of housework and family tasks between the sexes is becoming more common, especially among younger males.<sup>11</sup>

## The likelihood and potential impacts of different scenarios

Physical infrastructure and transport networks clearly define the built environment and have far-reaching impacts into the broader urban realm. Transport infrastructure enables, or, in some instances, requires land-use change, which in turn can have a broader impact on surrounding communities.

While the wider socio-economic benefits are included in an evaluation of schemes, the delivery of these developments are usually dependent on external, private investment, and in reality, this is beyond the remit and control of the transport scheme promoter. Sometimes the promised socio-economic benefits are not realised until long after the completion of the transport scheme, even though these idealised outcomes were used to support the initial justification of the project.

While it is recognised that the delivery of full-scale urban regeneration takes a significant amount of time and resources, it is also noted that during this interim period some schemes appear to negatively impact the same problems that they intended to solve, such as community severance, dead-space in the urban realm and hotspots for antisocial behaviour. Worse again, there is also the potential for forecasts to prove incorrect. Benefits may be diminished or a transport scheme might have little to no catalytic effect on development.

One example is the international station on High Speed One at Ebbsfleet, which was promoted in part as a catalyst for the Ebbsfleet Development Area, including a garden city with a population of 65,000. As of 2016, just 65 of the planned 15,000 homes had been built. To date the development is still largely unrealised, with Sam Jacob, an architect and critic, describing the vision as “fractured and incoherent”, with the renowned Richard Rogers labelling it as unsustainable.<sup>12</sup>

While future benefits are discounted, appraisals over a 60-year period may be misleading. This is especially true when considering that technology and social expectations are changing faster than ever. A scheme may become obsolete or be re-engineered entirely within this 60-year time frame. A cross-sectional study by Transport for London showed that changes to travel behaviour are particularly dynamic, underlining the

---

<sup>11</sup> Municipal Department 18 (MA 18) – Urban Development and Planning. *Gender Mainstreaming In Urban Planning And Urban Development*

<sup>12</sup> Booth R. Vision of Ebbsfleet garden city for 65,000 struggles to take root. *The Guardian*.

importance of looking beyond aggregate-level trends and instead seeking to understand, explain and influence the causative factors.<sup>13</sup>

There is more that could be done to improve the evaluation and appropriation of the distributional impact of schemes. This approach could comprise more robust analyses of a range of different outcomes, including a thorough consideration of the probability of each scenario, as opposed to just the one idealised outcome.

This approach could include probability-based analysis weighing up various possible situations and consequences and the relative likelihood of each, for example. This might be facilitated by the supply chain that could propose a suitable evaluation method on a scheme-by-scheme basis. Given the range in scale and diversity of transport schemes, this is likely to be more effective and offer more value than a “one-size-fits-all” approach, such as mandating a single methodology for all schemes.

## Contributors

Working with ICE’s Policy Team this consultation submission was produced by Zoe Henderson, Doctoral Candidate, UCL, Penny Gilg, Transport Planning Consultant, Atkins and Joseph Marner, Assistant Engineer, WSP.

## Contact

If you would like more information, or if you have any questions about this consultation, please contact [policy@ice.org.uk](mailto:policy@ice.org.uk)

---

<sup>13</sup> Transport for London. *Long-Term Trends In Travel Behaviour* behaviour-cross-sectional-cohort-analysis.pdf. Accessed October 4, 2018.



## Appraisal and Modelling Strategy: Informing Future Investment Decisions

Response by Dr John Nellthorp, University of Leeds

### 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?

*I agree with the general thrust of the Strategy, and the themes set out in the document seem well targeted.*

*I would like to focus on some specific aspects of how this is taken forward in my comments.*

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

*The strategy deals with potential further expansions of WebTAG into areas where transport has a wider impact, e.g. valuing attractiveness, public health/wellbeing, productivity and housing market impacts beyond those which are already incorporated. These developments should all be welcomed, scientifically, as they recognise more of the connections between transport and the overall economic performance and quality of life in the UK. In prioritising them, DfT might want to consider:*

- The potential for scientific progress in each case within the chosen timeframe;*
- The magnitude of the potential impact on the BCR and appraisal results – some of the extensions to WebTAG in the last 10 years have led to large changes, e.g. the introduction of Physical Activity benefits of walking and cycling.*

### 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.

***Location attractiveness** matters because it can potentially raise both productivity and wellbeing, for residents, workers and visitors. Health is a factor in both, and the Healthy Streets work in London focuses on this aspect.*

*An important challenge for cities outside London throughout the UK is to grow productivity and employment in their economic centres, and this requires more urban connectivity and an intensification of economic activity. Such changes (for example the successful development of Metrolink in Greater Manchester, and the changes in urban design in several cities) serve to provide places which are attractive for business and residential location, and to attract investment. As stated in the Strategy, there is a need for tools which robustly assess the quality of place or the quality of the urban realm, as part of understanding location attractiveness. Of course, accessibility itself is another key part of location attractiveness, including everything from international connectivity to local access to services.*

*Connected to this, a second priority is definitely to ensure that the **welfare change measures** in CBA adapt to accommodate the appraisal of projects with multi-sectoral impacts. We should be able to measure the overall welfare or wellbeing impact of redesigning a transport hub and its surroundings (e.g. Kings Cross St Pancras). The current WebTAG methods are extensive in their coverage of benefits – though not quite complete in this area. The way DfT methods intersect with MHCLG and Defra methods is an opportunity area.*

*Thirdly I would pick out **forecasting and valuing use of active modes** as a priority. Improving the quality/safety/ambience of walk and cycle journeys is key to understanding the take-up of, and potential increase in use of these modes (including the walk leg of accessing mass transit facilities). This work has obvious connections to the evaluation of place/urban realm quality as experienced by pedestrians, cyclists and public transport users.*

### **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.

*Despite the introduction of agglomeration impacts into WebTAG more than 10 years ago, and their key role in the appraisal of Crossrail, the feedback I get from practitioners across government and consultancy sectors is that the tools available for modelling productivity impacts are not adequate, and this is where I would suggest DfT focuses a block of effort/resources. The focus should be on science, data and the policy usefulness of the results.*

*Research in the land and property markets (e.g. in relation to Northern Powerhouse Rail) is very useful in establishing who gains from transport infrastructure investment, and by how much, including the spatial and socio-economic distribution of impacts – which feeds through into wellbeing and economic performance given location decisions and the spatial pattern of economic activity. We would support unpacking the links between the DfT WebTAG approach and the 'land value uplift' approach used by DCLG/MHCLG since Dec 2016.*

*Finally, to reinforce a point made by TfN in their co-ordinated response – it is very important that WebTAG addresses cases where the prime economic policy need is to grow productivity, output and employment in a region, as well as cases where the prime need is to grow housing capacity (London and South East). Research over the last 20 years since the SACTRA report has shown that much more can be done to understand the impacts on the distribution and level of economic activity of changes in transport infrastructure and policy – especially when they are allied to policy on, for example, urban development, densification and housing. This kind of perspective could lead to a more quantitative 'Rebalancing Toolkit', and a WebTAG that is more applicable to the whole UK.*

### **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.

**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.

*A small and easy win would be to incorporate the Value for Money guidance into WebTAG.*

*Development of a set of **case studies** as proposed in the document would – in my experience working with practitioners – be the single most helpful development DfT could make. I would suggest these are spread widely across modes and policy contexts.*



Transport Appraisal and Modelling Strategy:  
Informing Future Investment Decisions  
Consultation  
Department for Transport  
2/14 Great Minister House  
33 Horseferry Road  
London  
SW1P 4DR

Sessions House  
County Hall  
Maidstone  
ME14 1XQ

Email:  
Joseph.Ratcliffe@kent.gov.uk

By email:

[TASM@dft.gsi.gov.uk](mailto:TASM@dft.gsi.gov.uk)

15<sup>th</sup> October 2018

---

Dear Sir/Madam,

**Department for Transport's Transport Appraisal and Modelling Strategy:  
Informing Future Investment Decisions Consultation**

**Response from Kent County Council**

Kent, as an international gateway requires new and improved transport infrastructure to unlock significant growth particularly in the Thames Estuary and the coastal areas of the county. We will either, seek funding for and build this infrastructure, or we will make the case for other agencies to deliver. The impacts of new transport investment will affect not just our county but the UK as a whole. For these reasons we welcome the new guidance on *Understanding and Valuing Impacts of Transport Investment*, which update the Wider Economic Impacts. These changes will greatly benefit and assist the appraisal process.

Kent County Council's (KCC) *Local Transport Plan 4: Delivering Growth without Gridlock 2016-2013* (LTP4) sets out our ambitions for transport in the county and articulates what we will do to make sure transport is playing its part in making Kent a great place to live, work and do business. LTP4 describes the transport improvements, both of national (strategic) and local significance, required to support growth in Kent over the next 15 years.

To ensure sustainable growth and stimulate regeneration, the necessary transport infrastructure must be in place. This will be particularly evident in the Thames Estuary area, including the Isle of Thanet, where we have plans for a new railway station, Thanet Parkway, which will reduce the journey time between central London and East Kent to around 1 hour. This will improve the attractiveness of the area to businesses and increase the employment catchment area for Thanet residents.



From a Local Authority perspective, greater clarity in Government guidance is always to be welcomed. A strong focus on the analysis of impacts at a national level will also assist our appraisals of schemes that, previously, may have been regarded as local issues. In fact, many of the schemes on Kent's transport network have far-reaching benefits because of the volume of international traffic passing through the county, i.e. over 11,000 HGVs on average cross the Strait of Dover each day along with additional tourist traffic. Greater flexibility in the use of up-to-date modelling of these impacts can identify even a small benefit on the wider national stage. This is especially relevant with the current uncertainty around Brexit and the potential delays at the Channel ports that will cause congestion across the county without measures to manage freight traffic effectively to maintain fluidity.

In welcoming this consultation we also support the need to better consider the wider benefits to transport schemes throughout the appraisal process. We have several potential transport schemes in Kent and the South East which will facilitate greater levels of productivity and economic growth whilst also delivering other benefits.

I trust the above is helpful but should you require any clarification or further information, please do not hesitate to contact me.

Yours sincerely,

Joseph Ratcliffe

Transport Strategy Manager



---

## **Response to the Consultation Questions from Kent County Council**

The response from Kent County Council (KCC) focuses on the consultation questions that relate to identifying priorities for the strategy.

### **Priorities**

*Q1: 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?*

KCC agrees there is the need to better consider the value generated by improvements to urban realm. Current guidance fails to recognise the benefits of active travel and sustainable travel schemes, and because of this, vital public realm improvements are often unsuccessful once the existing appraisal methodology has been applied. Therefore, KCC supports the need to better consider the value generated by delivery of these schemes.

The Appraisal and Modelling guidance also needs to understand the impact of emerging technologies, such as autonomous vehicles, and their impact on values of time. Emerging and future technologies present an opportunity to drastically to change the way in which we travel and the transport market as a whole, meaning it is imperative this is considered within the guidance.

Furthermore, we fully support the need for the guidance to understand transport's impact on housing growth along a corridor and a consideration of productivity benefits beyond those generated by agglomeration effects. Existing guidance fails to recognise the wider benefits generated from a transport scheme, which is often the case for larger regional scale schemes with the potential to rebalance the economy through improvements in productivity. The introduction of scenario case studies will aid this and help to streamline and simplify the guidance, making it more user friendly while maintaining its robustness.

KCC also strongly agrees with the need to strengthen the link with evaluation so that appraisal learns from and helps build better evaluation evidence.

*Q2: What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?*

The strategy and guidance need to have a life span long enough to consider the amount of time required to deliver major schemes. For example, the assessment methodology should not be changed for a scheme just prior to the start of its construction as there has already been a large amount of investment made at a



scheme's development stages which would have followed the most up-to-date methodology at the time. Continual re-assessment of schemes due to changed in guidance are costly and cause delays to scheme delivery.

### **People and Place: Capturing the range of impacts relevant to transport policy today**

*Q3: What should be our priorities for improving the appraisal of people and place and why? Please select up to three areas.*

Current guidance gives focus to values of travel time savings, but consideration needs to be given to the fact that the value of time differs for each transport mode; for example, work can still be undertaken whilst travelling by train, but this is not the case when travelling by private car.

In addition, as an international gateway, Kent has a high proportion of freight vehicles travelling through and within the County every day. As a result, we fully support the undertaking of a study to investigate freight travel reliability and the needs to improve appraising network resilience. We recognise the benefits greater focus and research into freight could bring to the strategy and guidance.

### **Reflecting uncertainty over the future of travel**

*Q4: What should our priorities be for improving our understanding and treatment in modelling and appraisal and why? Please select up to three.*

The County Council agrees that emerging transport technologies mean people may choose to travel differently and question their need to travel at all. The uncertainty around autonomous vehicles and alternative ownership models could result in greater productivity levels whilst travelling. There also remains great uncertainty around future demand and travel behaviours, including changes in commuting and leisure travel patterns. As a result, we would strongly support the creation of an 'uncertainty toolkit' as part of the guidance, to provide support in selecting the most appropriate and proportionate tools given the scale of project and inherent uncertainty.

Furthermore, we believe the application of optimism bias adjustments remain a vital part of guidance, but this methodology often distorts costs and limits the number of schemes funded. KCC would therefore encourage the DfT to reconsider the extent to which optimism bias is applied within scheme appraisal guidance.

*Q5: 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?*



Whilst we recognise there is high levels uncertainty regarding future travel demands and growth, we would suggest greater weight is given to high growth scenarios when undertaking scenario planning. For example, the Thanet Parkway Railway Station scheme has great uncertainty in the core scenario regarding uncommitted housing development in Thanet and the uncertainty around the Local Plan. Ultimately this impacts on the business case, but given the level of housing growth that is required for the area, greater weight should be applied to high growth scenarios in order to better prepare for future needs.

Furthermore, the Lower Thames Crossing project is currently experiencing uncertainty around developments around Ebbsfleet Garden City, especially the London Resort development on the Swanscombe peninsula. Should these developments be delivered, the case for the crossing is greatly increased and so additional weight should be applied to potential high growth scenarios when undertaking the business case to ensure the scope of the project is able to meet demand when these developments are eventually delivered.

### **Modelling and appraising transformational investments and housing**

*Q6: What should our priorities be for improving the modelling and appraisal of transformational investment and housing and why? Please select up to three.*

We support the recently updated wider economic impacts guidance in capturing impacts of improved productivity and growth. This will greatly benefit the work we are undertaking as part of Transport for the South East (TfSE); the Sub-National Transport Body, and our involvement in the extension of Crossrail to Ebbsfleet. Further to this, we would support a commonly agreed framework to help people build knowledge about how local economies work and consider the impacts on those economies, including considerations of household and business location decisions; as well as the size of the labour market and the non-transport investments that may be required.

The Department's commissioned research study into the appraisal of different components of a package of road investments in the presence of synergies between the components is strongly supported by KCC. The 2018 Kent and Medway Growth and Infrastructure Framework predicts that £16.4 billion of investment in infrastructure is required to unlock the growth potential of the area. For this level of infrastructure to be delivered effectively it is vital there is the ability to appraise programmes of schemes to fully realise the wide range of benefits generated.

*Q7: 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 County Council would emphasise the need to give greater weight to Wider Economic Benefits (WEBs) in appraisals. Traditional journey time benefits are not the only reason for delivering a transport scheme. The strategic case for the Thanet Parkway Railway Station project is not just about improved journey times as it will have a transformational effect in East Kent, creating a more attractive area for businesses to location with high speed access to and from London, and also enabling the delivery of new homes and jobs. Another example is the Lower Thames Crossing project which will have a significantly transformational effect on not just the local area, but the county as a whole, in delivering new homes and jobs, as well as direct journey time improvements and congestion relief.

*Q8: What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?*

We would encourage the development of a set of case studies for schemes which demonstrate how different elements of the guidance can be applied. Given the variety of scope and scale of schemes being appraised, consideration of options to make guidance more accessible is greatly welcomed, along with more simple or alternative approaches to appraising schemes in the early stages of business case development.

*Q9: What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?*

KCC supports the provision of guidance for Senior Responsible Officer and Technical Project Manager, along with proposal to create 'at a glance' leaflets explaining key elements.

*Q10: 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 modelling of freight does require a more concerted effort to improve. KCC would support this including available data sources and techniques to more accurately forecast freight flows on the network, and the identification of the need for more informed techniques to forecast light goods vehicles and propose to review the role of the Great Britain Freight Model.

We would also fully support the review of existing modelling guidance, and gathering of opinions and suggestions from a broad range of stakeholders and practitioners regarding its application.

### **Developing modelling and appraisal tools that meet user needs**



The County Council has no comment on the three questions within this section of the consultation.

**Highways & Transportation**

Merrion House

Leeds

LS2 8BB

Contact: Paul Foster  
E:Paul.Foster@leeds.gov.uk

15.10.2018

Dear Sir/Madam,

**RE: Consultation on Transport appraisal and modelling strategy**

Thank you for the opportunity to respond to this consultation. Leeds City Council's comments have been fed into a collated response submitted by the Local Government Technical Advisers Group (LGTAG) National Transport Committee (NTC). We are supportive of this response however wish to raise the following additional comments.

Webtag has grown over the years to become an approach that is widely recognised as very thorough but because of this it has become increasingly burdensome for scheme promoters. This creates a situation where projects take longer and longer to get to fruition due in part to the appraisal burden associated with developing business cases. A stronger line on proportionality of approach is needed and this needs to be emphasised throughout the guidance. The emphasis should be on delivery rather than appraisal.

A significant element of the appraisal process is devoted to the forecasting and evaluation of scheme impacts many years into the future. Typically this includes the application of NTEM (Tempo) traffic growth and yet all the evidence is that forecast levels of traffic growth, principally in urban areas, have not materialised in the past. DfT Traffic Census data shows clearly that all day traffic levels (not just peak levels) in urban areas have remained largely static for decades while all the growth has occurred on inter urban roads and motorways. (See Road Traffic Estimates Great Britain 2016 which shows the growth from 1996 to 2016 as -0.5% on urban A roads but 40% on motorways. This trend is also apparent locally in West Yorkshire.) Arguably this is the most flawed element of Webtag. The National Travel Survey shows that trips per person have remained static at around the 1000 level for many many years. Car driver mileage has however fallen since the start of the century (from 3700 miles/person in 2002 to 3300 in 2017) and when population increases are factored in the total car mileage driven (based on NTS) in 2017 was marginally lower than in 2002, albeit higher than the low points during the recession. There is little evidence therefore that personal travel is generating increased car mileage along the lines that NTEM forecasts and certainly not in urban areas.

Given all the other various impacts identified in the consultation relating to future uncertainty it is therefore considered that more emphasis should be placed on demonstrating scheme benefits in the first five years rather than over the hugely problematic 60 year standard appraisal period. Historically, this was effectively achieved with high discounting rates and a 30 year appraisal period.

It is notable that the standard monitoring and evaluation approach for interventions covers just the 1 and 5 year post opening situations so there is a significant lack of data on the long term impact of schemes and whether the Webtag based forecasts are in any way even close to the mark.

Furthermore we would comment on the different values of time used for public transport, especially Bus, which currently makes schemes which reallocate road space to public transport more difficult to justify. Given the advances in technology, notably the use of mobile devices and provision of free Wi-Fi on public transport, Public Transport Travel Time can be productive and as such should be seen as an advantage in appraisal over the private car driver.

Yours faithfully,

**Paul Foster**  
**Transport Strategy Manager**



## **Response to Department for Transport consultation, “Transport appraisal and modelling strategy: informing future investment decisions”.**

### **1. Introduction**

This response is submitted by the Liverpool City Region Combined Authority. The Combined Authority covers the 6 districts of Halton, Knowsley, Liverpool, Sefton, St.Helens and Wirral, and includes Merseytravel, as its transport advisory and delivery body. Warrington and West Lancashire Borough Councils are associate members of the Combined Authority, partly in recognition of the city region’s wider economic geography that extends to West Lancashire, Warrington, Cheshire West & Chester, Flintshire and Wrexham.

Although as a member of the Urban Transport Group (UTG) our views are partly covered in the feedback submitted by that body, the following represents our specific comments on the consultation on the Transport Appraisal and Modelling Strategy. We welcome this consultation and would be willing to discuss any future developments.

### **2. 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 welcome the overall themes, which cover a substantial range of analysis, and it is possible to see most analytical priorities as being encapsulated by one or more of these themes. Note that we would particularly highlight the points below.

- One of the underlying problems with WebTAG is the perceived dominance of the economic case, which often seems to take precedence over the strategic case. Although recent guidance has emphasised the roles of the respective cases – including the importance of the strategic case – it remains the case that there is concern that decision-making may place greater priority on the economic case. This can be a particular cause for concern with schemes that focus on rebalancing the economy, where many of the scheme aims may be more strategic – and it is not clear whether the resultant Value-for-Money category encapsulates this. Any work which addresses this issue would be welcome – for example, through revisiting the rebalancing toolkit.
- We welcome the present tone in guidance, which encourages schemes to “follow WebTAG guidance” rather than being “WebTAG-compliant”. However, note that in order for schemes to avoid challenge, there really needs to be some thought as to what the ‘bounds’ actually are in terms of compliance.



- We particularly welcome a focus on “**Modelling and appraising transformational investments and housing**”. This has become an important issue in many transport schemes. (We would observe that within this theme there are a number of points outstanding from the previous year’s consultation on Wider Economic Impacts, including the debate around additionality which others including the UTG have raised.)
- In regards to “**Supporting the application of WebTAG and making it more user friendly**” the second part of this (“*supporting the application*”) is arguably the most critical. We strongly suggest the need for case studies – and where relevant worked examples – to assist in this. This is especially notable in regards to Wider Economic Impacts, where the recently updated guidance – although welcome – is somewhat thin.
- “**People and Place: capturing the range of impacts relevant for transport policy**” is an extremely diverse area, in which each of the sub-elements could well be a theme in its own right. We suggest there may be more detail here that needs more future exploration through successive workshops, feedback, etc., and we would be willing to participate in this. This theme covers many elements which are often poorly quantified within ‘traditional’ transport appraisal and other elements which are emerging issues.
- “**Developing and maintaining modelling and appraisal tools to meet user needs**” could be useful, although we would view it as important that such tools can utilise quality local data / forecasts and not just national datasets. (Note: alongside this, we suggest there is a need for the production of guidance around how local data / forecasts can be better assured to enable more confidence in such by the Department). Within this theme, we also particularly welcome the continued emphasis on the need to strengthen the link between evaluation and appraisal, and there is a need to build up an accessible body of evidence in this regards.
- There are number of areas which are somewhat weak within WebTAG. Many of these fit within the identified themes, but for clarity we list some of them here:
  - Greater recognition of economic benefits in different sectors which are (arguably) not fully covered, even under Wider Economic Impacts. For example: the Visitor Economy, where improved transport links encourage net increased tourist trips and spend, including indirect spend – in fact, there is some guidance on this, but it is largely hidden away within the unit on Regeneration Impacts. (Analysis of this specific sector can be further hampered by data values and the WebTAG data book only splitting trips into “commute/business/other”, thereby not explicitly picking up on the full ‘value’ of leisure travel).

- Nationally-available datasets can be weak. This may not be an issue for TASM itself to address, but it might be useful if TASM were to champion improvements in such data. For example: the *National Rail Travel Survey* which is still referenced and used in some transport schemes despite being substantially out of; the *Wider Impacts Dataset* is now also substantially out of date; the *Great Britain Freight Model* whilst not necessarily out of date appears to be a model where both details and access to it are sketchy; *NTEM* is often criticised as not fit for purpose in regards forecasting rail demand; and whilst access to data on road traffic volumes, air routes and sea routes is readily available, data on rail is not accessible for many who might make productive use of it, and data on bus and coach is extremely limited..
- The potential for net additionality; for example, a scheme may aim to encourage increased inward international investment into an area, but there is no mechanism to understand how such potential value can be incorporated.

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

Given both the ongoing imbalance in the UK economy and current/future major transport schemes, this suggests a key priority should be to better understand the impacts of transformational investments. We would suggest this covers a range of elements, including:

- a) **Better understanding of transformational impacts.** The recent guidance has now provided some detail in this regards, but this is a topic where much work is still needed (this should include guidance as to how impacts can best be measured when an investment occurs in an area with low or no existing transport flows);
- b) WebTAG should present **clearer guidance regarding proportionality** – i.e., when should the different levels of analysis (Levels 1-3) into the impacts of transport schemes be considered within the business case – for example, current guidance states regarding Levels 2 and 3 that “*in most cases their assessment may be neither proportionate nor relevant*”, which does not provide clarity to many practitioners;
- c) **Improving and strengthening the Rebalancing Toolkit.** Whilst the production of the toolkit has been welcomed, it does not seem to offer much that is new to support a business case beyond ensuring that practitioners take all current relevant guidance into account. Ideally we would the toolkit to be developed further; one proposal might be for it to incorporate some additional tool that could feed into the economic or strategic case (or perhaps the overall Value for Money category) to help emphasise the scheme’s importance;
- d) **Resolve outstanding issues from the Wider Economic Impacts consultation** – for example, revisiting the issue of net additionality.

In addition, work should be ongoing not just to emphasise the importance of linking appraisal and evaluation, but to begin using such work to build a body of evidence that is accessible to practitioners in future scheme appraisals. It may be that some outputs from this produce elasticities or coefficients that can be incorporated into future releases of the WebTAG data book.

### **3. 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.**

As a general point, we would regard all the areas listed within this section as of some priority. However, we would specifically pinpoint:

**Valuing attractiveness.** This is an area we would be keen to see more work in. Valuing attractiveness is quite important both at a generic level and when considering schemes of a more transformative nature. There are a wide range of impacts such improvements can have, such as: helping achieve mode shift (i.e., such as towards active travel); encouraging inward investment; sustaining the retail base; growing the numbers of tourists to an area; increasing the resident population. This is currently something of a gap in WebTAG guidance (and note that work in this area may also be useful to other government departments). There are a wide range of aspects to consider, which could be the subject of a workshop in its own right, but they might be divided as thus:

- *Functional aspects of transport* in attractiveness (journey time improvements, connectivity measurements, etc.) This is possibly the easier element to quantify.
- *Ambience aspects of transport* in attractiveness (improvements to the urban realm, journey quality, etc.) This is harder to quantify, but given the potential scale such impacts would have it should be part of the economic case rather than strategic.

**Appraisal methods for the future.** This is a wide-ranging area, but could theoretically cover a range of important developments. We would suggest these should include:

- *The relationship between transport and land-use change.* There is much to be done at academic and practitioner level in developing a better understanding of this. For example, the need for better consideration of impacts in schemes when land use is not held to be fixed.

- **Multi-modal appraisals.** To rebalance the economy, improved transport is often critical, but a multi-modal assessment is not always adequately conducted. For example: the solution to improve the economy may be a road scheme or a rail scheme or both, but currently each modal solution is often looked at individually. Future methods could better reinforce the need and tools to ensure cross-modal coverage of options. There is also the risk of inherent and unintended bias towards road schemes; a scheme that encourages traffic from roads needs to take account of lost tax. This needs examining - for example, should a BCR *without* this be reported?
- **Accessibility indices:** The commentary lists “Accessibility indices” and it would be very useful to consider here improved definitions of accessibility and connectivity. Current measures may not fully represent the range of what ‘connectivity’ or ‘accessibility’ are to a location. And we would specifically note that work in this regards for freight is minimal.

**Public health and wellbeing.** With current issues regarding urban air quality – but also general health and fitness issues – this needs to be a priority. This is a complex issue and far from short-term to examine, and brings in the need to start developing greater intelligence on active modes (including improved forecasting of walking and cycling).

Note: in addition to the three items listed above, we particularly welcome the proposal for examining **journey time impacts on freight** (4.15) – if often seems as if freight as a whole is something of an under-represented area in appraisals and the tools which are available for such work.

#### **4. 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.**

This is a very large open-ended theme, and we would urge that this is an area where a body of evidence (and WebTAG) values should be built up from scheme evaluations. This follows the recommendation on better linking evaluation and appraisal). It is important that where possible any future forecasting work includes a significant element of backcasting, and it is positive that the 2018 Road Traffic forecasts includes an element of this.

We would again observe that all the priorities listed by TASM within this section are of some importance, although the three listed below are what we would focus on.

**Uncertainty toolkit.** This is a tool which sounds as if it could be useful, although more detail is needed to understand what is proposed. Items we would like to see considered within this toolkit would include:

- Guidance as to how to portray uncertainty around TEMPRO outputs (for example, TEMPRO often diverges from local data which is better informed regarding local trends and developments).

- We would expect the uncertainty toolkit to link into what is produced for a scheme's Value for Money categories.

***Travel preferences and behaviour.*** This would seem to be the most important priority within this section. We would welcome research undertaken by the Department on young people's travel and would like this to be built upon. There are many key questions to be asked – for example, do ticketing products / wi-fi technologies / improved transport networks suggest generational change in mode preferences and behaviour?

***Understanding future travel behaviour.*** This is an important area, but given levels of uncertainty one which should aim to produce a range of values – not 'definitive' forecasts. The uncertainty around future travel behaviour needs to include issues such as:

- The presumption may be of a future with fewer young people obtaining driving licences (see above), but this may be contingent on future housing/jobs for this population being in areas with acceptable public transport provision, potentially at odds with some of the cutbacks observed in the bus network, where a 'lowest cost option' may not deliver a long-term alternative to car ownership.
- There is the suggestion that in the less people will commute on a 5-days-per-week basis, thanks in part to options for working remotely. Caution needs to be advised here, as there is not yet evidence enough to confirm this as a long term trend.
- Changes in leisure time and income have impacts for travel. For example, fewer people now take a 14-week Summer holiday, but the short-break market is on the rise, including out of peak season. Any forecasts in travel also need to take account the patterns of overseas visitors, whether on leisure or business travel.

Work regarding **ULEVs / CAVs** does not feature in our 'top three' above, although we do view this as being an area of some urgent priority. What is proposed could be made more robust, and in this regards we suggest the following considerations.

- The proposal seems to automatically link ULEVs and CAVs, which is not necessarily accurate. There may well be some overlaps, but whilst a CAV may be assumed to be a ULEV, a UELV may not be assumed to be a CAV. For ULEVs, the prime consideration is a change in energy source and how this is accessed; for CAVs, wholesale behaviour change is the uncertainty.
- With regards to ULEVs we suggest any work needs to pick up on differences that may exist – differences both at a geographic level (patterns in London / urban areas / suburbs / small towns / rural areas) and at a user type level (business / commuting / family / etc). It is important to begin building the body of evidence from observed patterns each year in this area.
- Evidence around the future regarding CAVs and their impacts is largely theoretical. We would not dismiss work in this field, but suggest that where it is used to form forecasts it should generate upper and lower values rather than a 'central case', thereby avoiding some of the uncertainty risk.

**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 key issue here comes down to evidence; we first suggest that steps in linking evaluations to appraisals here is critical, as understanding uncertainty from the results of past schemes will better inform that in future schemes. This places significant onus not just on each scheme ensuring the 'handover' between appraisal and evaluation (noting that work on developing a handover pack is still outstanding) but ensuring that this work becomes a body of evidence that is available to scheme practitioners.

Secondly, there is a need to recognise elements of scheme distinctiveness, and what this means for uncertainty. There needs to be work developed that considers this at a *geographic* level – for example, from previous schemes is there anything which suggests that uncertainty can vary between schemes in economically successful areas and those in areas with weaker economic performance – and a *scheme type* level – does uncertainty involve different considerations between (for example) schemes which resolve congestion, schemes which unlock development and schemes which encourage active travel?

Thirdly, there needs to be a view taken around the strengths and weaknesses used in the data that informs a business case (this is a point which might be partially answered by our first suggestion). Did use of NTEM data make for an underestimate or overestimate of traffic? Did use of local data overplay local economic performance? (With regards to the latter, uncertainty in local data and local forecasts could possibly be reduced by WebTAG guidance developing broad recommendations in production of local data that would engender such sources with more confidence).

**5. 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.**

As observed from the introduction and our response to Q2, this theme is of the prime importance. Whilst we would agree that transport alone is not sufficient in making for the rebalancing of the economy, we would state that a well-aimed transport scheme is a key enabler, and this is in line with the findings of the Northern Powerhouse Independent Economic Review (NPIER). When it comes to transformative schemes they have the potential to impact not just at local or regional level, but also to exert positive change on the whole UK economy, through a range of net additional impacts.

Many of the items listed by TASM within this section are of some priority, but we would observe the following specifically:



**Improving confidence in Land Value uplift.** This may be the most important priority in this section, given its role not just in terms of potentially helping to generate finance for a scheme, but also with regards to its importance in schemes which aim to transform weaker-performing areas of the economy. We strongly support the view that the value generated by land value uplift should be included within the BCR for a scheme. (We note in the consultation that it focusses on land value uplift for housing in this regards, but attention also needs to be paid to land value uplift for commercial developments.

**Gaps in local level data** is an important consideration, which might help in the level of data available to help make the case for schemes. Data sources which may of use here include that of HMRC – there may also be intelligence to be gained through commercial products such as the MINT database but use of this may be problematic. We would recommend work with ONS to identify data sources, perhaps including an audit of commonly-used local statistics, to see if there are any easy wins in regards to filling some of these gaps.

**Case studies showing application of different elements of guidance.** Although this probably relates more to section 6 of the consultation, this would be something highly useful for practitioners. It may be that as part of this consideration needs to be given to clarifying what is meant by “transformation”, as this is a term which is becoming widely used without perhaps always a consistent treatment/

We notice the suggestion for a framework on “**How local economies work**” and would want more detail on this before being able to say whether it is a higher priority than any of the elements above. Key here is whether it would adequately cover the differentiation between various economies - a productive “knowledge economy” city with dispersed economic zones may function differently to a city with a central area and reliant on more traditional industries, which may function differently to a market town reliant on an agrarian and visitor economy.

## **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?**

There are a number of transformational impacts which are currently difficult to represent in a scheme appraisal, other than by commentary within the strategic case:

- Demonstrating net additionality (i.e., an assumption of 100% displacement may not always be appropriate, as discussed in the UTG response to the Wider Economic Impacts consultation).
- Investments likely to make an area more attractive to inward international investment. (In part this can be linked to the above – but might also be considered as something of a factor in terms of valuing a place’s attractiveness – see our response to Q3).

- Schemes that encourage a step change in the area's visitor economy – although the visitor economy is in fact referenced in the WebTAG unit on Regeneration Impacts, this is not as clear or as comprehensive as could be – and may make for a useful case study in its own right. With Liverpool the 5<sup>th</sup> most important city in the UK for overseas visitors and the 7<sup>th</sup> most important for domestic visitors, we are constantly considering how this market can best and most reliably be presented within business cases.

As mentioned earlier, we welcome the changes whereby the WebTAG advice now seems to be less prescriptive; however, amongst practitioners this does leave some uncertainty about whether their business case may risk challenge. This may be especially so in schemes where we are trying to make the case for transformational investment, and thus some understanding as to the bounds of flexibility (perhaps via workshops) would help.

## **6. 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?**

WebTAG provides a good solid base for building the case for a transport scheme, and critically it ensures that practitioners comprehensively (for the most part) cover both negative and positive impacts of a transport scheme. The main barriers and challenges we would raise are listed below, some of which we have already referenced earlier in this consultation.

#### ***Data***

In our response to Q1 we indicated some of the areas where national datasets were weak or access limited; this included particularly NTEM, the Great Britain freight model, and availability of rail data. In addition to this, we would pinpoint that not all of the values in the WebTAG data book are broken down to sufficient geographies, and their use may represent something of a risk, indicating more work would be useful.

One specific technical issue related to WebTAG is in forecasts (such as the population figures in NTEM). A problem arises when this dataset becomes out of date. A conflict can arise, such as when NTEM provides one forward-looking message in terms of population change, but official data from ONS provides another. (i.e., this happened when NTEM 6.2 was still being used some years after the Census data was available). A more managed approach to updates of such official data would be welcome. We would also welcome more signposting within the guidance to the use of local economic forecasts as a sensitivity test.



### ***Ease of use***

For those who are experienced practitioners, the WebTAG provide a comprehensive resource; however wayfinding for those who are less familiar – we have earlier mentioned how consideration of the visitor economy is not prominent, and there may be many other areas, thus a risk of not all potential impacts being considered. Improved layout is indicated, as referenced in Q10.

### ***Proportionality***

Not all schemes need to apply a Level 2-3 analysis in their business case, and many would find it useful understanding a better definition of proportionality.

### ***Areas WebTAG does not explicitly cover***

There are some areas WebTAG does not appear to cover (in fact it may well cover them, but the ability to do so may be hindered by the tools/data available or even a fuller understanding of what WebTAG covers:

- Burden of proof around dependent development / net additionality.
- Journey quality.
- Schemes where growth in the visitor economy is a strategic aim.
- Mode shift of freight (beyond values in the WebTAG databook).

The provision of case studies may help alleviate some of this.

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

Recent emphasis from TASM has focussed on how WebTAG should be viewed as being flexible guidance rather than a fixed tool to generate a 'WebTAG-compliant' business case, and we welcome this. However, there is concern that should this flexibility be exploited, that government and others may query a business case's robustness. Assurance and advice on this issue would be welcome.

To encourage use of the flexibilities in WebTAG we would recommend increased use of:

- **Workshops** to explain and explore this understanding, and its limitations. Scheme promoters should be able to employ the flexibility when appropriate, but also be able to recognise where limits exist on such flexibility.
- **Case studies** portraying where flexibility might be used to improve a scheme's business case.
- **'Frequently Asked Questions'** regarding WebTAG flexibility, with answers from TASM that practitioners can quickly be used in the case of challenge. (This Q+A type approach might be useful in explaining other areas of WebTAG to a wider audience).

**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 see case studies – and in the case of technical questions, ‘worked examples’ – as being a key tool in improving the guidance. And note that although there are a range of options in terms of the actual presentation of WebTAG content, engagement directly with users through workshops will both ensure improved use of the guidance and be a useful conduit for feedback on improving the clarity.

Those already familiar with WebTAG are mostly able to navigate through the different parts of the current website with few problems. Not all may find the overall layout as being particularly intuitive, though. There are some design options to assist this.

- A ‘thematic’ approach could be adopted (by ‘themes’, this might mean a separate page for each type of scheme, a separate page for each stage of a scheme, or a separate page for each type of impact. This would take some resource to apply and manage, as many sections of guidance would appear in multiple locations. A great deal of care would be required when any part of the guidance is updated.
- A simpler approach would be to have a textbook-style design - the “chapters” would relate to different sections in a business case. This would be an evolution rather than revolution of the current website.
- Use could be made of incorporating ‘other relevant links’ on each page – although this again increases the workload should any page be moved.

## **7. 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 welcome the potential development of tools that meet user needs; for example, in some of the work needed to examine Wider Economic Impacts the availability of tools to assess this – and skills of those to employ such – can be limited. We would, however urge that a contentious issue may arise in terms of what data goes into any such tools – the use of national datasets versus quality local data being a recurrent debate.

Many of the issues raised in this section are of some priority, but we have flagged out top three below, all of which have formed a recurrent theme in our response to this consultation.

***Strengthening links with evaluation.*** We welcome any work that encourages and builds on appraisal-evaluation links. As we have already mentioned, a key activity should be to use this information to build a body of evidence that is accessible to scheme practitioners, to better inform future scheme appraisals. Over time, we would expect this body of evidence to expand into provision of elasticities and other values that can be presented via the WebTAG data book.

**Modelling of freight.** More work is particularly welcome in this field. Freight is a topic that is a key concern for the Liverpool City Region, where growth in freight at the Port of Liverpool (including the post-Panamax terminal Liverpool 2) and other logistics centres is a key part of our economy. Freight is felt to be something of a neglected issue in WebTAG guidance, and this is not helped by poor access to the Great Britain Freight Model. Areas which need to be examined include not just changes in domestic freight (such as the high growth in LGV traffic) but also more strategic elements, such as what happens to flows when alternative ports of entry are used. For example, data suggests that more freight coming in via the port of Liverpool – and hence closer to end markets – could significantly reduce net freight miles on UK infrastructure.

Any work which improves **NTEM forecasting** would be welcome (although we would argue that any such work should go hand-in-hand with work that improves the **Functionality of TEMPRO**. Areas where improvement in NTEM forecasting may be particularly welcome would include:

- Work to *improve the forecasting of car ownership levels* (for example, this might take more account of 'peak car' theories, or that of young people's future travel behaviour, as we have suggested at Q4).
- *Improved forecasting of other transport modes.* Specifically we would focus on rail here – currently NTEM 7.2 seems to imply minimal growth in rail travel, despite what has already been observed. A concern here is that if rail growth is underestimated then other modes may be overestimated. Much work has been done by Network Rail on their forecasts previously through the Regional Urban Market Studies, and we would strongly encourage the Department to consider this body of work, and in particular a revisitation of this work to take into account recent economic trends.
- There may also be a need to *better understand active travel potential*, and a scenario where this forms a greater part of the economic future may be a useful 'scenario' to be considered within NTEM.

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

It is important that business cases adopt a consistent and robust approach, and in this regards the WebTAG guidance works well. In encouraging innovation, it is probably important to flag up the options of using scenarios as a test against the 'core' business case. However, we do feel that the use of quality local data may be a particular area where innovation could be guided better whilst maintaining consistency.

Local data has many advantages: it may be more recent and hence accurate than national datasets; it may more accurately reflect known developments; and it may provide data at a more granular scale. It would be preferable if such data was not seen as a 'sensitivity', but as being a more likely 'core' scenario. However, in order for such a potential to happen, we would expect that the government would need confidence in such data. We would suggest that WebTAG provide guidance around what assurance should be conducted to ensure the local data used is can demonstrate acceptable validity. A key debate here would be in terms of how schemes that 'cross data boundaries' are dealt with.

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

Most relevant comments within this section can be viewed as a repetition of the above sections.

We specifically highlight our concerns over freight and active travel, two areas where understanding on a range of issues appears weak. There needs to be something of a review of the available evidence in this field, perhaps working with practitioners to identify sources and potential implications.

The use of Mobile Phone Data (MPD) is very much an emerging technique. As things currently stand, we see it as an emerging source, but not something which can be used as a blanket replacement for many current techniques. For example, the recent work by the Office for National Statistics looking into using MPD to replace the 'travel to work' section of the Census has encountered multiple issues, including on ascertaining journey purpose and mode used. This is not to say it won't improve in the future, or already be a useful data source for some bespoke pieces of work.

With the growth in smartcards for travel, this should represent a developing data source for understanding travel patterns and behaviour. However, differences in formats between the techniques being used by different operators and different parts of the country may mean it is not as easy gathering this into a cohesive unit. It is certainly an area we would urge TASM to consider.

Moving forward, continued engagement by TASM with practitioners will help both to keep everyone involved in identifying emerging techniques and best practice, and help to ensure that WebTAG remains world-class guidance. We look forward to engaging in continued dialogue with TASM in this.

# LGTAG Response on DfT Consultation:

## Appraisal and Modelling Strategy Informing Future Investment Decisions Moving Britain Ahead

### 1. Introduction

- 1.1 The Local Government Technical Advisers Group thanks the Department for the opportunity to comment again on possible changes to evaluation methods of assessing transport schemes. As a professional/technical organisation we represent a large number of local authorities in the country, these include those with highway and transport responsibilities such as Transport for London, London boroughs, Metropolitan authorities and Unitary authorities. Our membership has been well consulted directly and through our Transport Committee and Council and the response is well supported with no dissenting voices on matters of principle or the relative detail in the answers to the consultation questions.
- 1.2 We raise a number of major issues on the overall system of policy formulation, modelling, appraisal and funding methods for both national and local transport infrastructure development and maintenance. Individual authorities will naturally endeavour to attract funding from any available funding stream announced by Government for their areas even though they often know other schemes or strategies would be more likely to provide greater economic and social benefit to their areas.
- 1.3 LGTAG would be pleased to meet officials in the DfT dealing with all these issues and also with national politicians if it could be helpful to deliver better transport outcomes for the businesses and people of Britain.

### 2. Summary/ General

- 2.1 LGTAG have commented several times in the past on national and strategic policies and programmes to both the DfT and the House of Commons Transport Select Committees; most of these are available and downloadable from the LGTAG website or are available on request to us. A list of our main points, most of them previously raised, are as summarised below:
1. The country needs a National Policy and Strategy for transport to deliver the needs of businesses and individuals and be supported by all authorities with a focus in planning our future.
  2. We should not be adding to our infrastructure (and maintenance requirements) before we can properly maintain our existing assets and systems.
  3. Schemes should not be countenanced unless they deliver nationally and locally agreed objectives. This would obviate the need to take a number of schemes forward to appraisal or in many cases even to modelling. Although the Strategic Case is mentioned in Webtag it does not seem that this is often properly



addressed before a solution is put forward to meet an improperly assessed problem and then the 'solution' is appraised without a full range of possible interventions considered. There is a need to 'Vision & Validate' rather than 'Predict and Defend'.

4. Systems of evaluation and appraisal should reflect the real needs of the country and local area, be commensurate with the scale of the transport infrastructure involved and be understandable and transparent to the public and decision makers; scheme overheads at national and local level should (therefore) be minimised.
5. LGTAG believes the Appraisal Framework produces generally a helpful way of expressing the advantages and disadvantages of a scheme however the framework needs to be developed or improved to give a less biased assessment than is normally provided by the scheme promoter – this particularly applies to the 'Strategic Case' element of the framework and must represent properly perspectives from local and national viewpoints.
  - It must be recognised that generic or headline need for 'new homes' 'reduced congestion' 'improved air quality' need to be more formally prioritised according to local need.
  - New bypasses that provide short term journey time savings may fail to provide as much benefit as may infrastructure supporting increased homes, better air quality etc.
  - Greater specificity is required as to the primary, secondary and tertiary objectives.
6. LGTAG fully recognise that appropriate modelling or analysis of the use of any new transport facility is necessary to ensure a sensible overall design and hopefully to study if the intervention will address any real problems identified.
7. The linking of a modelled analysis of use of any new facility with an 'economic appraisal' is highly suspect especially for large road schemes. (To explain this comment, it is noted that the economic appraisal is largely based on time savings between a scheme and a 'Do Nothing' or 'Do Minimum'. This is normally a small difference between two very large figures each based on a large number of, sometimes inaccurate or unrepresentative assumptions – e.g. speed flow curves with no limitation of capacity, - - this is mathematically very unsound). It should also be noted that peoples' behavioural response to, for example, a time saving (required in a transport model), is very different from a national resource cost of time in the evaluation of benefits.
8. The calculated 'benefits' (see 7 above) from (Strategic) road schemes are usually mainly from peak hour car traffic and, even after recent alterations, still 30-60 years in the future. Most policy authorities want to discourage peak hour car traffic (so time savings for this group have little societal value) and the effects 30-60 years in the future are totally unpredictable and meaningless.
9. If the time or accident savings included in the economic assessment of schemes are important in evaluating the best schemes, then there should be a large shift in expenditure from large road and rail schemes towards traffic reduction measures (including parking enforcement), accident remedial schemes, bus lanes, pedestrian improvements, travel planning, subsidies to bus services, traffic signals etc. A number of studies have been carried out over the years clearly demonstrating that large strategic





road and rail schemes have substantially less benefits in terms of time and accident savings than single or packages of such smaller scale schemes.

10. Efforts to evaluate health, exercise, environment, air pollution, global warming etc. benefits are to be welcomed but are they really amenable to conversion to monetary values? New priorities on tackling the health related aspects of car dependency demand greater appreciation i.e. air quality impacts on the 40k premature deaths and the cost to the NHS of obesity and Type 2 Diabetes from poor exercise that cycling and walking would address.
11. More effort now seems to be being applied to potential 'real' economic benefits in terms of increased business activities; we have grave doubts about whether these are additive to 'time saving economic benefits'. This issue was discussed in the 1998/9 SACTRA report. Furthermore inter urban transport investment is likely to have much less benefit in such terms than investment within urban areas.

### 3. Answers to consultation questions

- 3.1 Bearing in mind the 11 points raised in our section 2 above, we have endeavoured to provide our response to the 13 questions in the consultation as follows:

#### ***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?***

As outlined in section 2 above we believe a more fundamental review of overall transport and planning policy objectives is required together with much greater devolution of funding and decision making to local regions, towns and rural areas. Nevertheless we have made some comments on the five themes as below:

- ***People and place: capturing the range of impacts relevant for transport policy-***

Delegating funding and decision making to local regions and urban areas, as mentioned, would ensure that the People and Place are reflected with genuine local knowledge and avoid unnecessary work on what are really local matters. If any background analysis work is needed for local policy and decision makers to consider reflecting best local practice this could be well worthwhile. Any journey experiences need to reflect the most common local journeys and most available modes for all i.e. walking, bus journeys etc. As mentioned in our section 2 we have great concern about the over importance attached to time savings and the value of time. Improving transport reliability demands redundancy and finer networks not more spending on enlarging strategic roads. We recognise the long term potential of increased automation in motoring. However there are far greater and more immediate changes including dockless and eBikes and in tandem with that the deferral of car buying in cities by those aged under 35.



### **• *Reflecting uncertainty over the future of travel –***

We agree that there is a high degree of uncertainty regarding future travel patterns, as mentioned above, and that this is due to the interaction of a number of factors. LGTAG has for example noted that initial forecasts regarding the benefits of home working have been overstated, also changes both locational and frequency of grocery shopping are changing travel patterns. Additionally, the decline in HGV traffic coupled with increased use of LGV's may also be related to increased internet shopping where goods are transported to the door by LGV rather than to the High Street in HGV's. We believe that the impacts have been to increase local journeys often adding to congestion. These changes in travel patterns and others including reducing numbers of young people choosing to learn to drive do not seem to be readily predictable and yet have occurred well within the accepted time period of the economic assessment for a project. Nevertheless, we would fully support work to be carried out into uncertainties but these must include the effects and mitigation of global warming.

### **• *Modelling and appraising transformational investments and housing –***

As mentioned we believe far better returns can be obtained by small scale schemes individually or as part of packages rather than 'Grand Projects'. However we have repeatedly supported the belated attention now being given to rebalancing the economy away from the south-east. Ways to increase the jobs in the regions including the north and reusing previously developed land together with improving the existing housing stock (and adding where required) would reduce the pressure and need for any further 'Expressways' such as the Oxford to Cambridge route and overdevelopment in south-east England.

We are concerned that the impact of facilitating and encouraging greater and ever longer distance commuting by car may be considered a positive outcome. Furthermore, if applied the outcome could be to render the reuse of better located previously developed land less attractive financially. For example the construction of an Expressway opening up previously greenbelt land for housing versus inner town / city regeneration, primarily because transport funding is the only funding available for a solution to a housing problem. However we accept that many rural roads do require improvement in order to reduce accident rates and we also accept that for inner-city regeneration the right transport investment can act as a catalyst.

### **• *Supporting the application of WebTAG and making it more user friendly***

Anything that can simplify, make more relevant and devolve decision making to the right level, in Webtag or other evaluation methods and guidance would be welcome. Webtag at present is a major drain on resources, creates an excessive overhead expenditure and is often unrepresentative as described in Section 2. LGTAG would be pleased to participate in any systems or discussions to improve the funding and evaluation of schemes with DfT, the Treasury and indeed Ministers, probably in conjunction with the LGA.





---

- ***Developing and maintaining modelling and appraisal tools to meet user needs***

LG TAG fully supports work to improve our understanding of travel behaviour and modelling of transport to cover a full range of transport strategies. We are also aware, from experience, of some of the inevitable inaccuracies in modelling. As explained above it is essential the modelled results, if fed - into 'economic' evaluation and - 'economic assessments', do not become the primary decision making factor.

**2      *What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months? People and Place: capturing the range of impacts relevant to transport policy today***

Work by DfT staff to identify what has worked and best practice over a range of schemes would be absolutely invaluable work to improve understanding of the benefits, successes and indeed shortfalls of a range of schemes and types of schemes and packages throughout the country. This should include both capital and revenue schemes and all schemes not just those that may have been assisted with central government funding. One area we consider could be further investigated is that of resilience, both in the sense of resilience that is built into the project design and also where a project may contribute to wider network resilience.

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

The first point to evaluate is the benefits as seen by end customers – businesses and individuals. This should be qualitative as well as quantitative. It is important that benefits and shortcomings are evaluated over short, medium and long term and what might have been done to enhance or change a scheme with hindsight.

Secondarily it is appropriate to evaluate schemes from a 'professional' point of view e.g. contribution to CO<sub>2</sub>, NO<sub>x</sub> pollution, noise, accidents, health, adverse effects elsewhere, etc. Translating the learning experience from such evaluations into what might work in the future would be the third stage incorporating best guesses as to what the future scenario might include. LG TAG is however concerned that adding more complexity into the process could increase preparation costs even further and the effect could be to create a "bigger black box" with little appreciation regarding the relationship of the numeric value and the actual outcomes.

**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.***

Modelling and Appraisal should be clearly separate as explained in Section 2. For modelling we need a better understanding of individual and group behavioural responses to transport changes and what works to deliver outcomes that are sought. For appraisal we need to understand what people and businesses as a whole value in terms of outcomes rather than being preoccupied with time savings. Uncertainties need to be checked -



possibly as scenarios. However, LGTAG is concerned that whereas identifying uncertainty is essential, understanding the scale for many of the variables would be difficult and as the projection looks further to the future the scope for error must increase. Accordingly, focusing on a limited number of key variables may represent the best option. However, we are unclear how the interaction with optimism bias is to be handled; experience suggests that cost modelling utilising Monte Carlo analysis to quantify risk is beneficial for scheme promoters who are charged with managing the risk in the current funding arrangements. Regarding transport modelling, simplification would be beneficial and use of alternative data sources could offer savings. In particular, the use of roadside surveys, which are both expensive and disruptive needs to be examined in terms of alternative data sources (such as mobile phones, the data from which needs to be procured by DfT on behalf of all highways authorities)

**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?***

As mentioned we have grave concerns already about the complexity of the modelling and particularly appraisal methods and the lack of transparency and relevance for decision makers. We have described above how we believe that delegation of decision making and funding would result in much better value for money from Transport Expenditure.

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

All small schemes and packages are likely to show much better value for money in the traditional sense than 'Grand Projects'. We would particularly draw attention to the earlier analysis of the benefits of Travel Planning and the success of schemes that were implemented under LSTF which included both capital and revenue elements of expenditure. Location and scale of housing provision is very much a planning matter but it is vitally important that the local infrastructure is provided: particularly walking, cycling and public transport within our (extended) cities and towns. As stated we also consider that rebalancing of the UK economy away from the South East would be helpful in which case large scale additional housing would be less necessary and could be better accommodated in generally well accessed brown field areas.

**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***

As stated above a proper analysis of the 'Strategic Case' including properly identifying any problems requiring addressing and agreeing the national and local objectives is the starting point and then an assessment of the



best transport schemes to meet the needs. Proper delegation to Regions, Conurbations and local authorities are more likely to identify measures likely to produce transformational schemes fitted to the individual areas of the UK. Scheme appraisal certainly in the traditional economic pattern is unlikely to be required but modelling of behaviour and travel patterns is essential to test if transformational schemes would have the potential to deliver the required outcomes. It is notable that in Wales there is the beneficial impact flowing from the Active Travel legislation. Appraisal and investment decision need to consider the way in which England is being left behind.

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

Three factors interact to present a barrier to some authorities and at least a challenge to most; Time, Cost and Resources. Time –Completing a project appraisal is a lengthy and time consuming process. In particular the construction of an acceptable transport model is particularly time-consuming. Invariably additional data needs to be collected, the model constructed and then tested all of which consumes significant time and resources. Cost – the overhead cost for carrying out Webtag analysis for an approval from the centre is very high and excessive for many authorities that have endured significant funding cuts over a number of years. The transport model is a particularly high cost element, invariably requiring, for most authorities, the employment of one of a few specialist consultants. Resources / skills – for all except the largest authorities, the staff and specialised techniques to make the case for a scheme according to the complexities of Webtag mean that all too often expensive consultants, used to optimising assumptions and processes to deliver a favourable Webtag result, are needed. Any measures to simplify or reduce costs would be welcome. Utilising new sources of data should offer opportunities to assist the development of transport models.

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

As described we believe a radical change is required on how beneficial schemes can be developed to meet real objectives and how regions and urban and rural areas choose and prioritise the schemes likely to deliver the most public good. It is noted widely in LGTAG that the now defunct LSTF funding stream worked well and certainly DfT official's advice was well received. It is notable that Wales, London and probably Scotland have developed appropriate appraisal methods to deliver schemes helpful to their areas which are a lot less dependent on the Webtag economic assessment methods

**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. Developing modelling and appraisal tools that meet user needs***



We consider the real requirement is how to change the system so that Transport and Planning authorities can freely develop the best strategies and schemes. However until this is done please do not complicate Webtag any further.

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

As stated there needs to be a separation between modelling and assessment particularly for the so called 'economic' analysis. While we have already touched on the mathematical failure of the assessment being on the basis of a small difference between two enormous values of (largely) time turned into cost, there is for example a logic for a behavioural value of time being used for choice of mode, destination or route. When assessing schemes in terms of time cost it would be more logical to use a societal value of time saving. For urban schemes time savings for car travellers in peak times would have very low societal values.

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

We are suggesting that a fresh analysis of existing schemes (see answers to 2, 3 and 4 particularly) and from this we are likely to see potential for real innovation. We are definitely not convinced that the present appraisal methods are either robust or consistent. Our experience from promoting schemes is we have to use consultants as they understand how models can be 'adjusted' to give the right answers in the appraisal. Minor changes to assumptions can often change a scheme's 'value for money' dramatically. Despite a myriad of interventions over recent decades the overall 'Place' where people live across the UK fails to offer genuine and healthy options to car. This inter-generational failure has marked and ingrained impacts including life outcome for the more disadvantaged. The absence of Equality Impact Assessment and Health Impact Assessment of approaches to transport (especially in the absence of a national Transport Policy) represents a loss to health and wealth across our towns and cities. We would however wish to place on record our thanks to the imagination of Ministry economists when evaluating soft or really smart measures for the previous but now defunct LSTF funding stream. We also see the advent of big data as providing an opportunity to better understand (at scale) the complexity of movement and understand appropriate ways to cater for that need – perhaps through new and innovative approaches that are not state led (i.e. Air B'n'B, Uber, MoBike, Gaist, Red Ninja)

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

We have expressed some major downsides with the existing system of both funding and appraisal and have suggested the general direction of where the UK should be going. While we recognise that our systems of analysis may be very sophisticated (and arguably too sophisticated), as a country we do not deliver good transport measures to meet the public or business needs.



---

We recognise that there is a need to spend money wisely but as stated as a country we do not deliver good transport and the present system of assessment, funding and approval is certainly significantly responsible for this failure. We understand there may be a nervousness of releasing control to regions and urban areas and potential loss of strategic control. However delegating responsibility will mean that schemes will reflect real needs and will have the by-product of ensuring the higher value small scale schemes get implemented rather than some of the 'Grand Projects' which tend not to deliver significant or even the claimed benefits.

#### **4. Conclusions**

While we have endeavoured to answer the detailed questions we would reiterate that we need a root and branch review of funding mechanisms for both capital and revenue, assignment of funding and approval systems and methods for deciding objectives, developing a full range of possible options and appraisal and decision making. TAG has long called for TotEx approach to Highways & Transport investment. We recognise the importance of ensuring that public expenditure does deliver the real needs for the public at the minimum reasonable costs to the taxpayer and alternative methods need to be established to deliver this. We also believe that Wales, Scotland and London have significantly different methods of scheme development and appraisal and learning from their experiences could be helpful.

As previously stated we would be keen to meet with DfT and Treasury officials and indeed Ministers to discuss possible ways to take this forward.

9-10-2018



## **Lord Bradshaw's Response**

### **Appraisal and Modelling Strategy- Informing Future Investment Decisions**

Appraisal of Transport Investment has always been difficult. Much use has been made of the value of time which can be measured/estimated. This is usually multiplied by a mechanism known as 'stated preference' where a sample of people estimate how much they would pay to enjoy the benefit being offered. Where people pay a fare for the journey, preparedness to pay is a common measure. The objection to this is the fact that the use of roads is free at the point of use and that many of the time savings are very small and these are added together (aggregated) and multiplied to provide high numbers when spread over a large number of users. The objections to this process are two-fold. The time saving are often too small to be of use and they are unpredictable on a congested road network. The benefits are likely to be short-lived if the scheme releases pent up, or suppressed demand. In the absence of a system of road pricing, what alternatives are available for assessing the benefits of transport investment? Land values expressed as property or rental values, represent the price people are prepared to pay to locate themselves. Because there has been lot of recent transport development in most modes it should not be difficult to collect this information and build on it to forecast outcomes based on real facts.

It is difficult to put monetary values noise, air pollution, and loss of landscape and as these are likely to be permanent, the presumption should be against these environmental issues and where this cannot be avoided, good quality mitigation should be provided. The provision of this mitigation should be a direct charge against projects.

## Midlands Connect Response to TASM Consultation: 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?

Whilst most of the pressing priorities have generally been covered in these five themes, there seems to be a gap in terms of the 'policy drivers' like environment, industrial strategy, devolution etc – which produce uncertainty at a different level. It is crucial from the MC's perspective to understand how these policy related changes might affect forecasting and appraisal.

Another missing element would be the guidance on developing sub-national/regional transport strategies. Whilst all emerging STBs are either developing or in the early scoping stages of their regional strategies it would be helpful to have some guidance or at least an indication as to what the Department would consider to be an acceptable assessment of regional needs.

Whilst we would not favour overly prescriptive guidance, as we believe that STBs should be given a good degree of freedom and flexibility to develop strategies which meet the specific needs of regions and local partners; we do feel that it would be helpful for DfT to state what they would require seeing in a strategy or analysis which sits behind it for them to be comfortable with its status as a robust assessment of regional needs. The reason for doing so at an early stage is to ensure that when STBs begin to work-up schemes from their strategies, they are doing so with some confidence that the Department understands the underlying strategic need or context for the scheme in the first place.

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

For us the priorities for the next 18-24 months would be:

- Guidance on firstly designating 'transformational' schemes and then appraising their potential impacts.
- Managing uncertainty and scenario testing





## 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.

DfT has identified the need to strengthen the evidence base for valuing congested values of travel time and incorporating them in modelling and appraisal tools. Whilst this would be useful in the appraisal of localised congestion problems; we have a slight concern that it might skew appraisal even more towards simply 'fixing' big congestion issues in and around big urban centres. We would like to see appraisal consider the opportunity for growth as well as simply fixing immediate issues.

This should be central to the aspiration to 're-balance' the economy, which applies East-West as well as North-South. If there is an over reliance on congestion-busting proposals, through an increased value of time for sitting in congestion then we would have some concern that investment would continue to centralise to those locations which are already the most economically successful.

**Valuing attractiveness** – Tool to robustly access the quality of Public Realm as perceived by those who live in it and link these measures to a robust valuation framework.

One of the key objectives of MC is to transform the region and create great spaces which can be captured if we have a tool to robustly quantify Public Realm

**Person-centred business cases** – tools to demonstrate the impacts at the level of transport user and not just on the wider economy. This would be helpful for some of our studies like the Midlands Rail Hub, which is aimed at providing increased rail capacity, and therefore crowding on trains. It would be helpful to be able to convey the case for this investment from the view-point of the user.

## 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. Provide advice on scenario analysis within the forecasting guidance –





A guidance on how to treat uncertainties and create alternative scenarios would be useful from MC perspective. However, there should be a caution in developing highly prescriptive common scenarios as they may suppress the regional and local impacts.

Regions should be allowed to develop alternative scenarios which are bespoke to the specifics of their own regional economies and policy thinking.

## **2. Capture the impact of Policy Uncertainties on decision making**

Any major investment or funding decision is affected by Policy (largely central government policy) based uncertainty which are not captured currently in the WebTAG guidance. We would see this as an important aspect to accounting for uncertainty in business cases. E.g. Policy thinking around Housing, Environment, Industrial Strategy etc all have an impact on developing business cases, but this policy is flexible and subject to change. How should this be accounted for in uncertainty?

## **3. Strengthen research and evidence base on the impact of technology on travel behaviour.**

Midlands Connect would see this as a vital piece of required research. Technology is rapidly changing the way we make travel choices and there are potentially aspects on the horizon which will make an even more fundamental shift. Guidance for model building and appraisal has not kept up with technology in this regard.

## **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?**

At Midlands Connect our current focus is on strategic corridor studies of regional and national context. Conventional economic appraisal might significantly understate the non-conventional benefits which could result from a more holistic corridor approach to business case development.

For example, in a corridor study, whilst some individual scheme may not demonstrate a particularly high conventional BCR, they can be shown to be important from the strategic context of the corridor. There is no mechanism account for this in either the strategic or economic cases as each individual intervention is considered only on its own merits – as opposed to how it fits within an overall package.

We are therefore developing some programmatic approaches to planning, such as, creating 'Enhanced Strategic Cases' to justify the strategic significance of the corridors. This will enable important corridors to realise the overall economic and housing growth potential.

In our view, when it comes down to individual scheme appraisal, the strategic context of a whole-corridor approach should be taken into consideration.

## 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.

#### 1. Defining Transformation Changes

From our perspective it is important that we get guidance on how to identify or determine if something is 'transformational' and how this should then be treated in scheme appraisal.

We would also like to see guidance on how we can account for 'potential' and 'opportunity' – i.e. the ability to demonstrate that a corridor could attract and accommodate future exponential growth over and above simply what's already been planned for. This was discussed in part in the 2017 consultation on Wider Economic Impacts and the ability to call on new modelling techniques. But with the default position being that there will be zero additionality at a national level this provides difficulty for bodies such as STBs. We would feel that planning across such large geographies will result in additionality at a national level, but there is no current guidance which helps us quantify that to DfT.

Our Strategy is aiming to understand how the region might be able to grow faster and more sustainably over time – which might mean proposing infrastructure as a 'catalyst' investment to encourage economic growth. How can this be accounted for in either programme-level or scheme-level appraisal and investment decision making? Further research and guidance will enable STBs to provide a more evidenced approach that certain schemes or programmes truly are 'transformational'.

#### 2. Productivity benefits beyond those generated by agglomeration effects

This is also very relevant from our perspective. One of the key objectives of MC is to strengthen regional linkages within and midlands and improve its connectivity with the entire nation and key transport hubs. Whilst the WebTAG guidance covers the land value uplifts and agglomeration impacts, there are other forms of

productivity impacts that are not captured by our existing guidance methods. Improvements in long distance travel links between areas could enhance productivity through channels such as encouraging cities and towns to specialise in a particular industry or part of the production process. Our corridor studies such as A46 and A50/A500 have also highlighted this impact.

### **3. Transport's interactions with other forms of investment –**

Transport improvements provide opportunity for other form of investments and services to be provides and therefore their interaction with other sectors is crucial.

Midlands Connect is seeking to develop an approach which looks more holistically at how public sector intervention or investment can be brought together around a large catalyst investment in transport infrastructure. We hope to demonstrate that you can achieve exponential or at least 'greater than the sum of its parts' benefits if a much wider business case approach is taken. For example, if a road corridor is upgraded in an area where we know there is a cluster of industries which have a heavy reliance on the SRN then how can further investment in skills/training, housing infrastructure, local transport etc be brought together into a wider business case?

We would welcome the opportunity to discuss with Government economists how such initiatives could be brought together and considered as wider investment strategies.

### **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?**

As above – the ability to plan for a scheme to become a catalyst to economic growth; rather than simply facilitating growth already planned.

## **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 DfT is continually publishing and updating the WebTAG guidance in the new and emerging areas like 'valuing induced investment' 'dependent development' and 'environmental impacts' etc. Some of this guidance is not very prescriptive and straightforward to use. There is a lot of scope for interpretation that makes them challenging to use them at times.

It would be useful if the new TAG Units can be supplemented with the real or hypothetical examples and case studies on how these can be used in different situations.

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

- Organising training and workshops for the institutions and individuals on the usage of different WebTAG guidance
- Maintaining a register of schemes where the guidance has been used successfully and providing users the access to the appraisal methodology for the schemes in the register
- Appointing 'guidance gurus' to provide advice on the application of different TAG units

**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.**

It would be useful if the new TAG Units can be supplemented with the real or hypothetical examples and case studies on how these can be used in different situations.

**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.**

1. **Exploring wider techniques** – Such as to model productivity benefits, transformational changes
2. **Providing guidance and tools to better reflect uncertainty over the future of travel** –guidance on scenario development
3. **Improving the accessibility of guidance** – ways to make it more user friendly, robust but simple to understand

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

- Encouraging innovative and proportional approach for the application of the guidance.
- Publishing case studies of the schemes where the guidance was successfully applied



- Continually update the guidance through feedback from different studies

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

- Analytical techniques using emerging data Sources like Big Data, INRIX. Mobile phone data etc
- Improving customer information and experience using real-time data and how this can be incorporated into scheme appraisal
- Dynamic traffic and pollution management



# Future Treatment of Uncertainty in Transport Appraisal and Modelling

Response to DfT Consultation Invitation by Minnerva (transport modelling consultants)

## Introduction and Aims

This document responds to the DfT's consultation, on its transport appraisal and modelling strategy to inform future investment decisions, with an emphasis on the topic of the future treatment of uncertainty in transport appraisal and modelling, a subject highlighted in the DfT's June 2018 Consultation Document, from which the following represents a set of extracted quotations:

*"We also need better tools to capture and communicate uncertainty to decision makers, including the development and use of scenarios."*

*"Our aim for the strategy is to provide robust, flexible and easy to use modelling and appraisal tools that can be used to inform the critical policy decisions that will be made over the next five years."*

*"We are facing significant uncertainty in the transport sector as a result of changes in travel behaviour that are not fully understood and the development of new technologies."*

*"We recognise that, as our appraisal framework has become more sophisticated, the demands on those applying it have increased."*

*"It is therefore important that we invest in techniques which allow us to deal with the uncertainty that is inevitable. These techniques should enable us to deliver analysis which presents a broad but robust picture of the future to decision makers."*

*"It is important that we have the appropriate tools to analyse and demonstrate the uncertainty around any new policy or investment to inform decision-making. To effectively support decision making, this information needs to be delivered in a clear and understandable way."*

*"A key priority for our strategy is to explore the appetite for an 'uncertainty toolkit' as part of our guidance to provide support to practitioners in selecting the most appropriate and proportionate tool(s) given the scale of project and inherent uncertainty."*

The consultation provides a set of consultation questions, with the following question providing the target for the response given by this note:

*"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 existing WebTAG guidance on uncertainty matters is provided in *TAG Unit M4 Forecasting and Uncertainty*. The approach defined in that unit might be categorised as defining ‘sensible, low-tech’ procedures, including the use of ‘risk registers’ and sensitivity testing based on different national growth scenarios suggested by the National Transport Model. The approach outlined in this note is, hopefully, still ‘sensible’, but is more high-tech in nature. This is seen as being necessary to match the challenges concerning the modelling of uncertainty that the Consultation Document itself identifies. The approach recommended here is therefore mindful of the implications for several matters mentioned in the Consultation Document such as ensuring: proportionality in modelling effort, availability of skills, clarity for decision makers, and transparency in the methodology.

Prior to describing the nature of the proposed methodology for addressing uncertainty issues, the note gives particular attention to the needs of the end-user, taken as the decision- or policy-makers informed by the results of transport modelling and appraisal.

A final section introduces Minnerva and the experience informing this response

## Aiding Investment Decision Makers

The Appraisal Summary Tables (ASTs) of WebTAG, as introduced in the Consultation Document, provide a significant means of aiding people appreciate the range of outcomes associated with transport schemes and policies on which large investment decisions are to be made. While the ASTs can make decisions clear in some cases, they can also highlight conflicting outcomes and less quantifiable elements that make confident decision-making difficult. In this context, introducing considerations of uncertainty and risk can be unwelcome as, worthy as they may be, these elements can easily further reduce clarity.

The aim of the procedure advocated in this note is to provide decision makers with some simple characterisations of the assessment outcomes of modelling (e.g. BCR metrics), namely:

- Are the outcomes robust [to a reasonable degree of future variability]?
- How significant will a future variation be [from the modelling assumptions]?
- What is the risk-reward status [how easily can assessed high benefits be undermined by changes]?
- Are transition points implicated [is a ‘tipping point’ or ‘critical mass’ effect at play]?

## Response Surfaces

The approach to aiding decision makers in this way is provided via the concept of a ‘response surface’. This is best envisaged as a three-dimensional map featuring plains, plateaus, hills, valleys, and gradients. Of the three dimensions, two correspond to inputs relevant to uncertainty, and the third to an assessment metric. The method works for higher numbers of dimensions but, obviously, is less easy to visualise and loses some of the intuitive appreciation which characterises the approach. A reasonable extension to four dimensions is to include time, in which case the contour map, instead of being static, changes in the manner of a motion picture, so hills may morph into valleys, and so on.

The recommendation for two input dimensions is for aiding comprehensibility; there can be more, but, as examples here, suggested inputs could be ‘technological changes’ (proportions of autonomous vehicles in the vehicle fleet) and ‘behavioural changes’ (proportions of personal access to cars via



ownership, sharing, and ‘as an [internet-based] service’). The assessment metric is taken to be BCR, but could be an environmental measure, and so on. It is most natural to place the assessment metric on the vertical axis. Whether ‘high’ or ‘low’ is ‘good’ or ‘bad’ depends on the metric, but for BCR ‘good’ corresponds to ‘high’ (i.e. hills).

The use of the response surface is done by locating the position of the central estimates of the two inputs (here, proportions) and the assessment metric (BCR) on the surface. If this position is located relatively centrally on a plain or plateau, then the uncertainty is not a particular issue for the decision-maker and the assessment can be considered robust.

If the position is located near to a hill or a valley, then there is considerable uncertainty and the results are not robust. The assessment metric could easily be improved if adjacent to a hill (higher BCR), in which case a decision-maker may make a conservative decision but one which potentially does not exploit the full potential of the situation. Alternatively, adjacency to a valley signals a high risk of failure. The decision-maker may decide not to invest on this account or, if the BCR is sufficiently high, decide that it is worth the risk to proceed with the investment.

Where there is a need to consider uncertainty with more than two inputs, it is possible to progress with a series of pair-wise sets (A&B, B&C, C&A, etc.) to form a fuller picture while still benefiting from the intuitive nature of visualisations based on contour maps. This approach applies too to more than one output assessment metric.

So far, the judgements from the response surface have been in relation to a single point defined by the central estimates of the inputs and output metric. In the manner that error bars are associated with data points in graphs of statistical data, the central estimates can be replaced by bars on all three axes. The bars on the inputs reflect uncertainty in the input values (here proportions), while the bar on the output metric reflects assumed uncertainty in matters that are not considered by the selected inputs.

It can be easier to understand if the bars are applied individually and in sequence to the response surface but, if used in combination, they define a three-dimensional volume (‘brick’) located in the response surface. If the sides corresponding to the input values still remain on a plain or plateau, then the results are robust for the expected range of inputs. The height of the ‘brick’ identifies pessimistic and optimistic assessments of the output metric.

Of course, this approach to treating uncertainty depends on a means of constructing suitable response surfaces, which is considered in the next section.

## Modelling Uncertainty and Constructing Response Surfaces

The crudest way to model uncertainty and construct a response surface is to run a (transport) model many times, each time with a defined change to one or more inputs. (This is more systematic than the Monte Carlo approaches mentioned in the Consultation Document.) The obvious problem with this is the impracticality of making the large number of runs given the complexity and time-consuming nature of transport models.

The solution to this problem lies in the use of ‘meta-models’. These are ‘models of models’ and are characterised by the fact the meta-models are fast to run and can be used generate the many points

used in the construction of response surfaces. The procedures include spatial interpolation methods ('kriging') that reduce the number of points that need to be generated.

## Research Background

The development and use of meta-models for managing uncertainty in complex models (MUCM, or here, UCM) has been an area of active research and development that has been applied to many fields of interest including meteorology, astronomy, ecology, and so on. So far, it has not been applied in the field of transport modelling and this note represents a call for transport to catch up with other fields in this regard.

The development of UCM methods has a strong UK track record, with the University of Sheffield a prominent founder with a team led by Professor Anthony O'Hagan<sup>1</sup>. The University of Aston has developed a suite of software tools (MUCM Toolkit) to support the approach<sup>2</sup>. In recent years, UCM interest has broadened internationally<sup>3</sup>.

The description of UCM methods given below merely summarises key points of the UCM methodology as it applies to transport modelling. The website [mucm.ac.uk](http://mucm.ac.uk) provides a home for information generated by a project running from 2006 to 2012, as well as currently serving to foster a research community continuing work on MUCM ideas.

## An Outline of the MUCM Methodology

An MUCM meta-model is a statistical model obtained from running the large model a large (but manageable) number of times. Once established, the smaller model is simpler to apply to examine uncertainty.

### Nature of Meta Models

- The meta-models are *emulators* of the large model (the *simulator*)
- MUCM based on *Bayesian* ideas
  - Initial estimates are made more precise (adjusted) through addition of further sample observations
  - Involves some beliefs about probability distributions
- MUCM supports two forms of emulator

The procedure for generating response surfaces is therefore to select the inputs used by the meta-model, which will be the inputs of most interest and significance concerning uncertainty (e.g. technological and behavioural changes in the example discussed), as well as identifying the output variable of interest (e.g. BCR). Initial assumptions are made about the nature of the statistical models of different components. These assumptions are altered using Bayesian modelling according to the

---

<sup>1</sup> With Aston University; Durham University; LSE; National Oceanography Centre, Southampton

<sup>2</sup> See <http://mucm.ac.uk/> for further details

<sup>3</sup> For example, UQLab is a general-purpose Uncertainty Quantification framework developed at ETH Zurich (Switzerland)

‘training’ sets of results provided by the large model being run with different sets of input values. Once established to a sufficient degree, the meta-modelling can be used to construct an appropriately detailed response surface to determine likely changes in outputs for changes in input values around the central estimates.

The prior assumptions for meta-models relate to beliefs about relevant probability distribution functions or, in simpler modelling, of basic statistical metrics such as means and standard deviations. Sometimes these prior beliefs can be based on reasonable, existing empirical evidence, but for changes with no past histories (e.g. technological developments), it is pertinent to observe that the MUCM project developed facilities for eliciting suitable information from sets of informed and expert judgements.

A further view of the concepts outlined here is given in a July 2015 presentation to the Transport Modelling Forum in Manchester<sup>4</sup>, but the MUCM web site offers much greater detail of the statistical modelling.

## Outputs from Uncertainty Modelling

The aim, as described here, is to provide decision-makers with straightforward-to-comprehend information on the impacts of uncertainty on forecasts. In simple terms, the decision-makers receive:

- i) An AST table, as at present
- ii) An associated uncertainty comment concerning the relative robustness (or not) of the central output estimate, and any attendant risks (of whether tipping points are implicated).
- iii) These comments should be evident in a provided response surface (presented as a 3-D graphic or as a video, if time changes are considered).

Recalling the notion of a ‘brick’ introduced above to define a volume of interest in the 3-D response surface, it can be noted that this volume shows how much the inputs would have to change in order for the output to change by an amount (e.g. sufficient for the money category of a scheme to change). This relates to the notion of ‘switching values’ mentioned in the Consultation Document.

## Uncertainty Modelling in Practice

The Consultation Document is mindful of the complexity of much WebTAG modelling and of ensuring proportionality for different types of studies. The kind of statistical modelling outlined here is not familiar to many in the transport modelling and appraisal community, so there is a serious question about achieving a broad uptake.

It is therefore necessary for initial case studies to be established, which would need to be supported by the DfT, in some measure at least. These case studies should also serve to generate capabilities for the more routine application of the uncertainty methodology. One suitable approach for delivering this capability is via the establishment of centres, initially possibly academia but later consultancies, that provide ‘modelling uncertainty as a service’. That is, transport modellers would run their models a requisite number of times with the appropriate input changes, and then supply the results to

---

<sup>4</sup> See <https://drive.google.com/file/d/0B-x3iEfB8cU9ZIZBVUNHVEMxdIE/view>

uncertainty modelling specialist who would return a response surface, from which the modellers, in association with the uncertainty specialists, would agree the 'uncertainty comment(s)' to be associated with the AST.

Although meta-models limit the amount of times the main transport models need to be run, there is still a large amount of computation implied for these models. These models therefore best run on 'server farm' type arrangements where many instances of the models can be run in parallel. This can provoke difficulties for current practices for modelling software licences, which limit the number of instances running at any one time, so customised licences would need to be agreed<sup>5</sup>.

## Summary and Conclusions

The capabilities sought by the Consultation Document for handling issues of uncertainty are considerable in nature. The approach of using statistical 'meta-models' outlined here both provides a powerful and comprehensive approach but, significantly, provides results that can be presented in intuitive ways to decision-makers.

The methodologies have the backing of considerable past and current research activity, but development is required to translate these into 'production ready' facilities that are accessible to existing transport modellers. The methodology lends itself to the establishment of specialist centres that can provide the requisite services to transport modellers. The setting up to these centres will require communication and understanding between transport modellers and specialist statistical modellers unfamiliar with WebTAG-style modelling. This will require training for both parties; in general, including uncertainty into WebTAG modelling will necessitate improving the understanding of statistical modelling among transport modellers. The DfT and academia will have an important role to play here.

---

<sup>5</sup> This form of approach is widespread in some industries, e.g. CGI used in films and commercials, so current paradigms can be exploited by transport modelling.

## About Minnerva

This note has been prepared by Miles Logie, a director of the transport modelling consultancy Minnerva. Miles has a long career in transport modelling. In association with co-director Martin Bach, this has provided a number of developments and outcomes relevant to the topics raised in the Consultation Document:

- In recent years, and reflecting extensive previous experience, Minnerva has developed a WebTAG-compliant regional modelling system for Surrey County Council. Distinctive features of this model have been:
  - The speed and low cost involved in developing an entirely new and detailed, multi-modal model, modelling not only Surrey but also surrounding areas including significant elements of London adjoining Surrey. The model includes the entire UK mainland but with obvious less detail further away from Surrey.
  - *“We shall also engage with the wider industry on the opportunities presented by 'Big Data' sources for use in transport modelling applications, aiming to reflect best practice as it emerges to enhance existing guidance, where appropriate, in addition to guidance on matrix development.”* Based on Minnerva’s specialist knowledge of the area, the multi-modal base trip matrices for the model were developed using state-of-the-art procedures, with strong statistical foundations, for integrating a wide range of types of observed data, including elements of ‘big data’.
  - *“We ... look to improve the ability for practitioners to generate more bespoke local forecasts”:* The modelling system includes an integrated ability to derive and support ‘local models’. These have been used extensively by Surrey CC to support the transport appraisals associated with the Local Plan proposals of boroughs and districts within the county. This has provided a key approach to ensuring proportionality in the modelling for each local area.
  - *“... we will be working ... to develop case studies which show how housing can be taken account of in decision making. Other potential studies include transformational investments, different uses of the National Trip End Model and those that demonstrate the use of innovative approaches.”* A significant feature of the modelling has been to exploit the features of the National Trip End Model (as provided by CTripEnd, rather than its variant TEMPRO), to incorporate local data and information, notably about population, housing, and employment forecasts. Several methods are provided for reconciling national and local forecasts to provide a consistent view across Surrey as a whole.
- *“...we intend to review current best practice in freight modelling and propose a way forward on evolving methods to provide more robust representation of this vital part of Britain’s traffic in our analysis.”* Minnerva has previously developed a demonstrator national multi-mode freight model. The focus of the model was on Scotland, but the model covers the entire UK mainland in some detail. One purpose of the work was to illustrate (a) the way that open-data sources could be exploited to generate such freight models and (b) show that established modelling software (OmniTRANS) provided sufficient flexibility to reflect the characteristics of freight and logistics practices, as opposed to just personal travel. The modelling distinguished ‘logistical’ traffic (heavy, long-distance, containers, etc.) with more varied ‘delivery’ goods

vehicles. This included assessments of heavy and light goods vehicles on the highway network, as well as container traffic on rail and shipping.

Miles Logie has pursued research activities in association with universities (including for three years as a part-time Senior Research Associate at Imperial College London). This has included a particular interest in various aspects of Bayesian statistical modelling. This has been used in connection with topics of data fusion and characterisation of data sets through modelling, but is relevant here to the advocated methodology on modelling uncertainty, which includes Bayesian components.

MILES LOGIE, MINNERVA, SEPTEMBER 2018



# **DfT's Appraisal and Modelling Strategy Consultation - Mott MacDonald response**

15 October 2018



# Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	15 Oct 2018	A Bain, S Cox, A Clewett, A Gordon, M Hamunen, N Johnson, G Lyons, B Mackley, S O'Hare, T van Vuren	S O'Hare	C Judge	Consultation response

**Document reference:** WEBTAG18 | 01 | A

**Information class:** Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

# Contents

1	Introduction	1
2	Priorities	2
3	People and Place	3
4	Reflecting Uncertainty	5
5	Transformational Investments	8
6	Supporting the Application of WebTAG	11
7	Developing Modelling and Appraisal Tools	14
	Appendices	17
A.	How can a very high value for money transport scheme have a negative Benefit Cost Ratio (BCR)?	18

# 1 Introduction

Mott MacDonald is pleased to respond to the current consultation on DfT's appraisal and modelling strategy. Our response reflects the views of a large number of practitioners in the fields of transport planning and economics.

We recognise the immense contribution of WebTAG in supporting evidence-based transport investment decisions and hope that this consultation response will support the DfT in improving the guidance for future generations.

We have structured our response with a chapter for each of the main appraisal themes, with a sub-heading for each of the consultation questions. These follow the order in Annex A of the consultation document:

- Priorities
- People and Place
- Reflecting Uncertainty
- Transformational Investments
- Supporting the Application of WebTAG
- Developing Modelling and Appraisal Tools

To gather the views of as many of our staff as possible we have held a series of debates using our internal Yammer discussion groups. Each of the five main themes has been the subject of a week-long debate, led by a senior professional with support from an early career professional. The theme for each week was introduced to staff using a 5-minute video presentation. Staff from all disciplines and with all levels of experience have been encouraged to participate. Informal polls have been used as part of these debates to help distil the views of our staff. Across the five debates there have been over 500 contributions from a body of approximately 70 unique contributors.

We would be happy to share the videos and details of the polls if the Department would find them useful.

Inevitably, there is not always a single consensus view on the questions raised by the consultation. Where this has been the case, we have done our best to reflect the broad spectrum of views in our response.

We hope you will find this document a useful contribution to the debate. We would be happy to discuss any of our response in more detail. If you have any questions about our response, please contact:

Steven O'Hare (Senior Transport Modeller and Modelling Practice Champion), [steven.ohare@mottmac.com](mailto:steven.ohare@mottmac.com), or

Andrew Gordon (Technical Principal), [andrew.gordon@mottmac.com](mailto:andrew.gordon@mottmac.com)

## 2 Priorities

*Q1: 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. The themes are broad enough to cover all of the key areas where we think current guidance could (and should) be improved.

*Q2: What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?*

Our detailed response covers a number of different recommendations, including primary research, development of new guidance, and providing more support in the use of existing guidance.

We recognise that implementing all of these recommendations, and those from other consultation responses, would represent a significant investment of time and money. Practical constraints will mean that it won't be possible to do absolutely everything that the consultation responses request (and it may be undesirable to do so, as there is unlikely to be complete consistency and unanimity across the profession).

We would therefore recommend that the following principles are considered when developing a work programme in response to the consultation:

- Clearly define the appraisal and modelling strategy, based on consultation responses. Ensure that all development tasks are consistent with that strategy.
- There will need to be a balance between 'quick wins' that deliver visible, and useful, improvements in a short time, and the need to invest in longer term work that may take years to reach fruition.
- The priorities should recognise the 'bread and butter' nature of the appraisal and modelling carried out by most of the profession on a day to day basis. 'Transformational' schemes are, by definition, high profile, but they account for a relatively small proportion of the appraisal and modelling work carried out in the UK.
- The impact on the ability to spend transport budgets 'wisely' should be considered, whether this is the risk of building the wrong scheme or implementing the wrong policy, or the risk of spending a disproportionate amount of money on appraisal and modelling. Any development task that is unlikely to affect investment decisions should not be a priority.

## 3 People and Place

*Q3: What should be our priorities for improving the appraisal of people and place and why?  
Please select up to three areas.*

**Mott MacDonald's consultation on the 'People & Place' theme focused on the priorities identified within the consultation document, with more detailed themes emerging from each of these through the process. The three key priorities identified are examined in more detail below.**

### Valuing Attractiveness

Our first priority for improving the appraisal of people and place is **more robustly valuing qualitative elements** of transport schemes, such as attractiveness. It is recognised that people are generally identified within transport models and scheme appraisals based on their travel behaviour, but we believe that this could be expanded upon.

It is noted that the concept of place in new transport schemes is often identified through movement and place hierarchies, which can reinforce existing hierarchies through placing a premium on a high movement function. There may be a **need to understand the opportunity cost of prioritising movement over other scheme benefits**, such as good design, social interaction, and connectivity to surrounding amenities. The Gehl Institute's 'Public Life Diversity Toolkit' (2016) provides empirical data on how public realm can contribute to quality of life and this may be a good starting point in this process.

The appreciation of people and place within the transport sector is usually assumed, but many transport professionals often fail to account for these factors in their work. Greater appreciation of these concepts, as well as the **importance of quality of life to transport schemes**, may be required. It is noted that values of time have been studied for longer and to a greater level than values of place, so a concerted effort may be needed to achieve greater balance.

Furthermore, it is argued that non-monetised, and often subjective impacts are often marginalised and not given due weight in Value for Money assessments. Although there is a requirement to **reduce the reliance on monetisable impacts in scheme appraisal**, the question of how we manage this whilst improving our ability to value qualitative scheme elements is a difficult one, especially given that Gross Domestic Product (GDP) is a troublesome measurement. The Pedestrian Environment Review System (PERS) and TfL's Valuing Public Realm Toolkit (VURT) parameters currently attempt this quantification but the evidence base is yet to reach a critical mass.

### Public Health and Wellbeing

Secondly, the importance of **improving public health and wellbeing** through more robust appraisal of people and place are an important priority, and should be included more effectively in WebTAG guidance.

Current guidance exists on monetising the impacts of new transport schemes on the landscape, as is also done through the Mott MacDonald-developed economic appraisal tool TEAM; yet it may not be measuring the right things. For example, urban fringe has low landscape value and urban core has high landscape value, which are unsurprising when related to average ground rents, but are likely to encourage urban sprawl and discourage high density city centre development. These have the effect of encouraging car use and minimising walking and cycling,

failing to meet the DfT's sustainability objectives and negatively impacting public health and wellbeing.

Furthermore, the monetary impacts of an ageing population, with related health concerns, the side-effects of obesity, the negative impacts of mental health, and the cost of environmental pollution on productivity and the economy have been proven to be significant and impact the public purse directly. We would recommend that these should be built into the decision-making process on new transport schemes, potentially through the segmentation of impacts on different social groups along class, age, and ethnic lines. This approach may offer more detailed appraisal and achieve more socio-economically equitable, and beneficial transport schemes as a result. We also feel the existing distributional impact appraisal (DIA) process could be enhanced in a similar manner.

The multifarious positive impacts on public health and wellbeing from strong transport links and new schemes should also be included within this process. From 37 voters in our internal poll, 51% stated that physical health (32%) or mental health and wellbeing (19%) were the key reason they cycled as a means of transport, providing further evidence that active modes do not just benefit the environment or the economy, but society as a whole. These social impacts are important and need to be better quantified within the WebTAG guidance. Indeed, Unit 4.1; 3.1.8 of WebTAG states that "future research may be needed to explore the impacts of physical activity on reducing the risk of the incidence of specific diseases and the associated morbidity (i.e. health related quality of life)". We believe this process should be accelerated to account for physical and mental health within WebTAG as their relevance to new transport schemes is clear.

### Active Modes

The third and final priority for improving the appraisal of people and place is valuing active modes. As stated above, **planning for active modes has obvious positive consequences for public health and wellbeing which should be clearly identified at scheme appraisal**. In order for walking and cycling to be considered more centrally to new developments, we believe that developers need convincing of the economic benefit of developing more space for pedestrians both for themselves through quick returns on investment, and for local economies through increased retail spending and social interaction within an attractive environment. To achieve this, there may be a need to better align the benefits of pedestrianisation with the DfT's goals of sustainability and reduced congestion, referencing the success of cities in Europe, e.g. Amsterdam, and further afield, e.g. Singapore.

**We do not currently collect sufficient data** on walking and cycling and this should be improved so that the evidence base is more robust when considering the benefits and impacts of such modes. The options and methods for collecting transport data are improving and developing rapidly and we should take advantage of mobile phone and other digital data when building appraisal tools, through the information they provide on route choice and origins / destinations. The link between walkability and land values and the perceived quality of a place should be investigated in more detail as the evidence base is still relatively thin to support the benefits although there does appear to be a consensus on improved walkability supporting local economies.

## 4 Reflecting Uncertainty

*Q4: What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? Please select up to three.*

**Accommodating not concealing uncertainty** – We are pleased to note the emphasis in the recently published ‘Road Traffic Forecasts 2018’ on *plausible* scenarios and the corresponding absence of reference to a ‘*most likely*’ scenario. It is important that scheme appraisal aligns with this approach in the treatment of uncertainty. In place of the ‘core scenario’ or ‘central case’ **more effort is required to represent plausible future contexts for tomorrow’s travel – reflective of the uncertainty space. In the absence of this, the opportunity for robust decision making is compromised.** Whether *relative* plausibility (or probability) should be considered – and to the extent that a ‘principal’ scenario emerges – has stirred debate in the transport analysis community of Mott MacDonald. However, there is agreement regarding **the inability of the language currently in use in modelling and appraisal to suitably accommodate rather than conceal uncertainty.** Regardless of whether a principal case is still to be considered as part of a scheme appraisal, representation of other plausible scenarios and sensitivity tests should be introduced to the Appraisal Summary Table (AST) to **better reflect the susceptibility of scheme outcomes to future uncertainty.** For this, guidance must be provided on developing a reasonable set of scenarios and sensitivity tests, with both the assumptions and limitations clearly set out. It should become more apparent that there is risk in failing to reflect uncertainty through what could be considered a pretence at being more definitive about the future. The *format* in which these alternative scenarios are to be included or accounted for in the AST has been the subject of much internal debate, highlighting amongst experts its subjective nature; and highlighting in turn **the need for guidance** on the matter.

**Flexibility to evolve and advance understanding and treatment of uncertainty** - Guidance should allow for further flexibility, where fitting, so that new approaches may be trialled with lessons learned and understanding evolved, while still supporting the appraisal process and related decision making. There is otherwise **a risk of inertia and concerns over ‘compliance’ holding back progress just when it is needed.** This could enable, for example: (i) a new emphasis to be placed on **behavioural modelling**, in turn helping to understand the new behaviours we are observing; (ii) **proportionality** of analytical approach to be better aligned to purpose within scheme appraisal, with some experts suggesting that simpler models could in some situations be more appropriate than their more complex cousins (which can appear suited to current guidance); and (iii) opening up appraisal to **better model peak-spreading** on schemes which are looking to tackle congestion issues, with the understanding that a number of areas of uncertainty (e.g. flexible working) have been modifying and will further modify daily flow profiles - which current average peak models cannot portray. However, **opening the appraisal process to a greater degree of flexibility may also open it up to multiple and even conflicting interpretations in its application.** The subjective nature associated with handling uncertainty is accompanied by (unconscious) bias amongst analysts – internal polling in Mott MacDonald suggested that the majority of analysts consider that this remains a major concern in forecasting. **Mitigating these concerns again calls for new guidance.**

**Analytical robustness beyond the base year** - Existing guidance can appear to place greater emphasis on the validation of base year models, than on the robustness of the forecasting itself stemming from that base year. In relation to the point above, greater emphasis on robustness of the forecasts themselves should not necessarily mean greater modelling complexity.

**Employing smaller, simpler models with reduced run times could allow greater attention**

**to be paid to sensitivity and scenario testing, thereby taking stronger account of the uncertainty concerned.** We believe that **the length of forecasting periods used for economic assessment also merits reviewing** with a need to consider the pros and cons of periods reaching too far into the future (whereby the credibility of the results may be diminished) or not far enough (nearer-term forecasting that is in turn extrapolated into the longer term could be giving undue emphasis to current preferences and behaviours).



*Q5: 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?*

**Effective communication** - Presenting the results of uncertainty analysis in a meaningful way in business cases requires careful consideration to be given to the language and content used such that **a balance is struck between transparency of how uncertainty has been handled and simplicity that avoids paralysing the decision making itself**. A series of different alternative forms of presentation emerged when this issue was brainstormed as part of the internal Mott MacDonald debate on this consultation. Two examples are as follows:

- *Providing a probability distribution of values of the scheme's BCR*: this can and does provide a useful and simple visual depiction, however, the outputs are particularly sensitive to the input assumptions associated with drivers of change that are themselves uncertain.
- *Providing a table summarising the different scenarios and their associated appraisal outcomes*: this would portray the range of plausible outcomes, but could over-simplify matters and lead to a risk that decisions are based on what is deemed to be a preferable scenario, rather than based upon least regrets.

**Guidance for decision makers as well as for analysts** – Allied to the point above, decision makers need to be aware of the subjectivity faced by analysts themselves in handling uncertainty. This awareness should in turn help **ensure the decision makers are able to understand the importance of their being able to qualify the robustness of the summary results presented to them**. This is not about giving licence to the decision making process to put the analysis itself to one side but about **ensuring the decision maker is as equipped as possible to make a decision they believe to be robust for the circumstances faced**. Indeed such guidance may also be important in securing the support of the decisions makers for the extent and nature of uncertainty analysis that is warranted and which must be resourced.

We would also like to note that Mott MacDonald supported a high-level roundtable discussion on handling uncertainty in transport planning and decision making which took place in July this year. The report is available here: <http://eprints.uwe.ac.uk/37926/> We encourage DfT and others to also consider this as part of examining the responses to its consultation.

## 5 Transformational Investments

*Q6: 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?*

There was an agreement among the discussion participants that more emphasis should be given to the construction of the **narrative** behind a scheme that proposes transformational impacts; to be able to build a realistic model, it is required that the promoter's development logic is clear. However, it was pointed out that a **modelling framework for strategically planned change does not currently exist**. If the analysis is carried out by extrapolating forward from the present, it will not capture the potential for transformational change. Furthermore, it was noted that the logic behind some of the schemes proposing transformational changes has changed over time, and supplementary modelling is being used as an additional bolt-on rather than an inherent part of the original modelling work. This reduces the credibility of the scheme's appraisal as the comment is often heard that *'the bolt-ons are only included to boost the BCR'*. **Therefore, the participants welcomed the suggestion to create a series of case studies showing how areas have changed over time and felt that this would help in the creation of a robust narrative for new transformational schemes.**

From the modelling point of view, and in relation to the issue of creating a credible narrative, it was highlighted that it is possible to look at the results of a LUTI or SCGE model and judge whether the direction of change makes sense, but **a robust quantification of the impact of a truly transformational transport scheme on, for example, employment or GVA, seems beyond us at the moment as the emphasis has to be on national scale economic impacts, neglecting the fact that transformation occurs at different spatial scales**. To improve modelling, it was agreed that it is important to have, as a starting point, some **high-level forecasts**, and to base the optioneering around them.

As for the choice of a supplementary model, it was agreed supplementary models (such as UDM for example) work well at early stages when trying to decide how to invest across a large area, but as schemes develop they need more refinement, which is where a model like TEAM<sup>1</sup> comes in, which helps demonstrate the linkages between economic growth and new transport schemes.

Regarding modelling and appraisal of housing, it was pointed out that **new housing will most likely lead to a redistribution of residents, not additional ones**, although local impacts need to be properly reflected. However, **new housing does accommodate growth and relieves overcrowding in urban areas as well as addresses pent-up demand**. From a modelling point of view, **it was highlighted that it was unclear whether a correction into NTEM always needed to be made in cases of new housing developments -is the narrative about growth or redistribution?** In addition, a question related to identification of bottlenecks in growth was raised. Modelling housing should take into account where the capacity restraints are, i.e. it is possible that there are other constraints in the network that prevent growth of trips materialising. As an example, if the number of parking spaces in a city centre is not increased the amount of car commuting is likely to stay constant, even with significant new housing and other complementary interventions<sup>2</sup>.

<sup>1</sup> <https://www.mottmac.com/article/918/economic-research>

<sup>2</sup> Assuming other work locations are not available within the model

A discussion participant also shared a case study *How can a very high Value for Money transport scheme have a negative Benefit Cost Ratio (BCR)?* (C White and S Sirivadidurage, 2014, European Transport Conference) that details practical issues found when using the dependent development approach in appraisal work. We have attached the paper in this document and would be happy to provide further information on any of the points made in the study.

Regarding modelling and appraisal of a package of schemes, it was agreed that in an environment where a project's funding is based on Value for Money framework, packages of schemes are hard to assess. Inevitably, **there will be package components that don't add enough to warrant funding on their VfM contribution** (although they could be an important part of the overall package and narrative). Previous experience of Mott MacDonald shows that in some cases an essential part of a scheme has ended up not being funded, and therefore has blocked the benefits that the overall scheme could deliver. In addition, it was maintained that the model error could easily be as large as some of the individual package elements. Moreover, **with packages with a large number of interventions it is simply not practical to model and appraise all combinations of all interventions**. As a solution, **a series of cumulative tests to ensure that progressive interventions each add value** was suggested.

*Q7: What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why?*

**It was agreed that the narrative behind the transformational benefits of schemes is important;** there were concerns that the scheme promoters tell the story they want to, sometimes without challenge. Therefore, developing a **series of case studies to show how transformed areas change over time is a priority.**

**Post opening evaluation is important for all models,** but even more so for schemes that rely on non-traditional mechanisms and benefits. In the experience of the participants of the debate, some of the wider economic effects can be very small, perhaps spurious, and unrelated to the scheme itself, as well as difficult to extrapolate over space and time. Therefore, **gathering evaluation evidence** to show how different models that have been used in transformational schemes have performed is another top priority. One way to achieve this could be for scheme funders to mandate and specify evidence gathering as a condition of approval.

**Thirdly, it was considered that extending programmatic appraisal methodology to consider a package of interventions by different government departments was important.** A transport scheme may be one part of a package of interventions that could also include, for example, housing and training/education/skills elements. In pure transport appraisal terms, the transport scheme may not appear to represent value for money, but it may be essential in enabling other parts of the package to deliver their full benefits. This is a concept that is similar to, but extends much further than, current WebTAG guidance on dependent development.

## 6 Supporting the Application of WebTAG

*Q8: What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?*

**Inflexibilities in the prescriptive nature of parts of the guidance, particularly around base year validation standards** - It is understood that WebTAG is intended to be non-prescriptive and to help practitioners prepare appraisal outputs in a flexible and proportionate way. However, this does not typically play out in practice, **with interpretation of WebTAG amongst scheme promoters and practitioners often being limited to meeting the quantified targets and standards it contains**; for example, around base year validation, the effects of matrix estimation and output elasticities from realism tests. Whilst we recognise the importance that schemes are assessed on a similar basis and that no scheme is favoured simply because of modelling methodology, **prescriptive standards can also have unintended consequences where models are used for purposes that they may not be suitable for**, as is correctly recognised by paragraph 3.4.2 in unit M3.1. To overcome this barrier, we suggest that **guidance should move away from generic quantified assessments and towards provision of better guidance on how to demonstrate that a model is suitable for its intended purpose**. This could include, for example, focussing on model performance in the area of influence of a particular scheme and not just across the whole model. We would also recommend that **where prescriptive targets exist, the research that led to the creation of such targets be published**. It would then be possible to assess the consequences of not meeting these targets and to make an informed judgement of whether a model is suitable for a particular purpose.

**Inaccessibility of the guidance** - The guidance is presented in book chapter format in a series of individually linked pdf documents. This makes it **difficult to search, to navigate and to bookmark or highlight important sections for future reference**. We would recommend **moving the guidance into a web-based repository** in line with how most people now access information online. Further discussion of this recommendation is provided in our response to the third consultation question under this theme.

*Q9: What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?*

**Provision of additional material to sit alongside the guidance in the form of “How To” guides and case studies** - Internal polling of analysts within Mott MacDonald showed that there was a **strong appetite for additional material to illustrate application of the guidance in practice**, with opinion eventually coalescing around a need for the **development of both “How To” guides and Case Studies** to serve different purposes. We would recommend that **“How To” guides, if worded and presented correctly, would assist practitioners in developing assessments that satisfy a set of principles that are sufficient for producing a good model** that is appropriate in many cases. Such guides could include checklists of minimum expectations that would also be useful to scheme promoters in assessing the appropriateness of what is produced. **Case Studies could then be used to illustrate different ways in which the guidance can be used, flexibly, to answer the questions that each separate study requires**, perhaps highlighting cases where simplified, proportionate approaches were used and the associated circumstances that made them acceptable. Publication of **Case Studies would also provide a medium to highlight innovations or deviations from the guidance that were approved and appreciated**, thereby providing confidence to practitioners and scheme promoters that alternative approaches can be acceptable where they are appropriately justified and providing a mechanism for developing the practice of modelling. That all said, **we would caution that there is a risk associated with “How To” guides that they could reinforce the notion that WebTAG is prescriptive and that there is only one acceptable way to undertake assessments**. This highlights the importance that “How To” guides are appropriately worded and focus on principles, rather than a prescriptive step-by-step guide.

**Provide checklists for scheme promoters** - Our experience with scheme promoters is that their understanding and interpretations of WebTAG vary but that **most are not modelling experts and simply want to know that any work done is to an appropriate standard**. The prescriptive standards currently within WebTAG therefore provide a set of quantifiable tests that can be used to make such judgements. If guidance moves away from such standards, as we have suggested in our response to the first consultation question under this theme, then we would **recommend that the production of checklists as an aid to scheme promoters in assessing the appropriateness of work undertaken**. Such checklists could include questions that scheme promoters should ask and have answered, for example, around the area of detailed modelling, data sources used, uncertainties within forecasts. Checklists could also cover a list of items that scheme promoters should expect to see in deliverables, making it easier to interpret reports provided.

*Q10: 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.*

**Transfer guidance to a web-based, wiki-style dedicated website** - Internal polling of analysts in Mott MacDonald showed that **the majority of respondents rate the presentation of WebTAG as poor**, with many highlighting it as a significant barrier to using it and assimilating the guidance that it contains. In its current form the **guidance feels old-fashioned and static**. It is also very wordy and can be difficult to absorb. This detracts from the value of the guidance that WebTAG undoubtedly contains. We would **recommend that the guidance is transferred into a dedicated website and set out in presentation that is more akin to a “Wiki”, with a good internal search engine**, bringing the presentation of content into line with other online repositories of information. [Wikipedia](#) provides a good example of some of the principles that could be included in such a site:

- Material fills the full screen instantaneously in contrast to WebTAG units, which, when opened, fill less than half the screen and which also have several introductory pages that have to be scrolled past
- Hyperlinks to cross-reference relevant material stored elsewhere
- Clear table of contents for each page describing its content
- Easily accessible search engine available on every page
- Ability to easily bookmark particularly useful subsections using the browser window

**Such a format would make guidance much more accessible and would also be more likely to engage younger generations within the profession.**

**Provide a platform in which practitioners, scheme promoters and DfT representatives can share experiences** - Alongside a dedicated website we would **be keen to see a platform (like Yammer) that enables practitioners, scheme promoters and DfT representatives (as the custodians of WebTAG) to interact with each other**. This could be used to share experiences, to ask questions, to post tips, to promote the release of updated elements of the guidance. Such a platform could be used to engage with the appraisal and modelling community on a more regular basis and to potentially make more incremental changes to guidance; for example, to address highlighted inconsistencies within the guidance where they exist.

**Explore the use of alternative communication mediums to present material** - This could include **videos, slideshows or infographics**, all of which could be used to introduce new parts of the guidance, to present case studies, or to explain “How To” guides. This would improve the **accessibility** of guidance to those in the appraisal and modelling community whose natural learning style does not predispose them to absorbing information from report style documents. It would also modernise the presentation of guidance, which again would make it more engaging to younger generations within the industry.

## 7 Developing Modelling and Appraisal Tools

*Q11: What should our priorities be for improving the development of modelling and appraisal tools and why? Please select up to three.*

**Promoting a greater understanding of NTEM forecasts and operations** – During open discussion between Mott MacDonald colleagues, it emerged that the constraining of trip ends to NTEM forecasts in local areas is often a point of ambiguity among practitioners and clients, particularly local authorities. Better guidance around

- when to constrain, and what assumptions constraint reflects;
- what to constrain (trip ends or population and employment inputs);
- the spatial level at which to constrain planning data,
- and what assumptions and calculations have gone into NTEM forecasts

would help to match the forecasts with the expectations of end users. Tools that could help to produce bespoke local forecasts would be beneficial to many projects and hopefully lead to more suitable and explainable forecasts. One suggestion is to make CTRIPEND openly available as a tool, with documentation to help practitioners to apply it appropriately.

**Development of existing DfT tools** – When questioned regarding the current tools that the department provide and maintain, some individual comments were raised:

- **DIADEM** – still very widely used, but the long terms plans for the software need sharing so practitioners can plan accordingly.
- **TUBA** – aging software that is becoming increasingly cumbersome to use on larger and more segmented models. Needs to be reviewed and potentially rewritten.
- **WITA** – better communication is needed around the release of the new version.

More generally, we suggest that the user group meetings for these tools should be re-instated to allow queries and comments like the above to be shared more readily and to allow practitioners to input into ongoing development.

**Improvements to freight modelling** – Given the importance of goods traffic for both the economy and for the environment, we don't feel that a) the current practice, b) advice in WebTAG and c) the commercial tools available for forecasting freight traffic impacts is adequate. Input data is often poor and aged, relying on national data sources with poor spatial detail since alternatives such as mobile phone data and TrafficMaster data do not cover HGVs well. There also need to be improvements in how LGVs are segmented within base year OD matrices to allow more specific growth drivers when forecasting.



*Q12: How can we best encourage innovation whilst maintaining a consistent and robust approach?*

**Innovation in the option development stage** – As the world and available (transport and other) technology evolves, we are increasingly required to model concepts that can only be represented through innovative modelling approaches. Continuing to use traditional methods will inevitably promote more traditional, and not necessarily the most beneficial, schemes and policies. We acknowledge that it is not straightforward to adopt new approaches, but we suggest that the department should be open to innovation in the option development stage where model requirements are less strenuous and critical than in the Economic Case. This would allow practitioners to develop an understanding of new technologies such as big data driven models (including Artificial Intelligence), activity-based and agent-based models, and to build up the skills required, whilst also serving to ensure that the transport programmes put forward include all modes and types of intervention, rather than just those that have been modelled traditionally.

**Appropriate success criteria for all tools** – On reflection we as practitioners, alongside our clients, are often quick to reject innovative approaches because they cannot conform to the quality assurance criteria that are set out in WebTAG. We recognise the importance of these criteria but feel that they have been shaped by the tried and tested methods that we use currently and as such are too rigid, stifling innovation. We therefore suggest that defining a wider set of criteria to justify the robustness of “non-traditional” methods would be beneficial, allowing flexibility depending on the purpose of the model or solution method. Where there is already flexibility within the guidance or where flexibility is introduced, we hope the department can play a role in ensuring that these flexibilities are understood by clients and practitioners alike.

**Transparent sharing of innovative progress** – During discussions around innovative model approaches that are emerging within our industry, it was noted that much of the promotion of these technologies comes from a commercial standpoint. These models and their results are presented in a way that makes them more marketable and not necessarily as an honest assessment of how well the technology works or compares with standard methods. In the few cases where validation reports for new techniques have been made available, it has been refreshing to understand the progress the technology has made, current shortcomings and what purposes it is currently suitable for. To this end, we would like to see a central location, managed by the department, where emerging guidance and assessments of new model technology can be gathered.

*Q13: What new and emerging techniques and methods should we potentially explore and what problems might they solve?*

**Using big data to test our modelling paradigms** – Evaluating existing uses of big data, the emphasis until now has been on better informing the trip matrices and validation data with which we populate our base year models. Although this has undoubtedly been to the benefit of modelling, it does not utilise the full wealth of data available. The focus has been on the averages of travel movements, rather than changes over time and the variability in travel movements and travel conditions. We would like to see exploration of this aspect of the data, led by the department, using it to challenge the underlying theories behind our modelling and investigating if it can be used to improve our long term predictive models.

**Agent-based modelling**– Through internal discussions around emerging techniques, there was support among Mott MacDonald colleagues for the idea of applying agent-based models in our transport appraisal; their operation makes behavioural sense to the lay-person and they can handle new modes and technologies that traditional trip-based models cannot. However, there was also consensus that we currently do not have the knowledge, skills or commercial software to develop these models or to understand fully how or where they are best applied. There are reservations that by investing in new model techniques, we replace model specification error with exogenous input uncertainty due to the need to provide very detailed forecasts of what the future population will look like. We encourage the department to lead an effort between practitioners, academics and software developers to advance in this area.

## Appendices

- A. How can a very high value for money transport scheme have a negative Benefit Cost Ratio (BCR)? 18

## **A. How can a very high value for money transport scheme have a negative Benefit Cost Ratio (BCR)?**

# **HOW CAN A VERY HIGH VALUE FOR MONEY TRANSPORT SCHEME HAVE A NEGATIVE BENEFIT COST RATIO (BCR)?**

Chris White and Sansaka Sirivadidurage

Mott MacDonald

## **ABSTRACT**

The UK Government recently approved a major improvement for Norwich's Postwick interchange on the A47 Trunk Road due to the scheme enabling employment development to proceed. Although there would be a negative impact on traditional travel time benefits for existing car users, the benefits from the new employment, its location and its users mean that the scheme would produce an overall value for money that is very high.

Some transport interventions will help to unlock new development or, to look at this another way, the new development is directly dependent on the implementation of a proposed transport intervention. This paper examines the practical issues encountered through the application of transport benefit appraisal methodology. It explains how benefits are derived and why a scheme with a negative BCR actually represents very high value for money.

The UK Department for Transport produced guidance several years ago in WebTAG which dealt with some of the issues, the calculation of planning gain and transport external costs, but requiring the conventional transport benefits to be based on traffic levels excluding new development trips. However there is no guidance in WebTAG on the calculation of Gross Value Added (GVA) for employment gains.

Some of the problems addressed by the paper include the difficulty in determining dependency of a development on the implementation of a transport scheme, the irrationality of calculating transport benefits without the development trips being included and the assumptions required for GVA calculations, especially those on the additionality of development.

The paper suggests that the dependent benefits should be included with the conventional benefits so that the calculated BCR properly reflects that value for money for a scheme. It also makes suggestions for how the guidance should be altered to address some of the problems and how GVA benefits should be set out alongside the transport and planning gain benefits.

## 1. INTRODUCTION

Conventional transport scheme appraisal assumes the same land-use in both the without – and with-scheme cases. Thus the transport scheme is independent of changes in land use. However there are some transport interventions that will help to unlock new developments. Such developments are called dependent developments. Appraisal of dependent developments requires a different approach as the land-use assumptions without the transport scheme are not the same as those with the scheme. This has been addressed in the UK Department for Transport's WebTAG guidance in TAG unit A2-3 which provides guidance on how to estimate benefits of dependent housing development. The same approach can be followed for any other development type although dependent developments that are aimed at job creation will provide significant Gross Value Added (GVA) benefits for which there is no guidance in the above WebTAG unit at present.

This paper highlights practical issues encountered through the application of transport benefit appraisal methodology in WebTAG A2-3 in the context of dependent developments and then highlights possible remedial measures where applicable. The paper is organised as follows. Section 2 provides a methodological review. Section 3 describes an example application of the method. Section 4 identifies issues in the current methodology when applied in practice and provides suggestions for possible improvements while conclusions are presented in Section 5.

## 2. METHODOLOGICAL REVIEW

For conventional transport appraisal the land use is the same in both without and with scheme scenarios. Hence the benefit of the transport scheme can be assessed using the traditional notion of the change in consumer surplus where the demand curve is constant with regard to the policy being evaluated. This satisfies the condition that is required to use the rule of the half principle – the *ceteris paribus* condition or, put another way, with other things the same. The complexity of dependent development appraisal arises from the fact that land use is different for without and with scheme scenarios and thus transport benefits should ideally be estimated from

$$= T0 \text{ on } DM - T1 \text{ on } DS \quad (1)$$

Where

T0 on DM is the total trip costs calculated from assignment of the trip matrix T0 without the dependent development onto the Do Minimum (DM) network which excludes the transport scheme (referred to as Scenario A in WebTAG)

T1 on DS is the total trip costs calculated from assignment of the trip matrix including the new dependent development onto the Do Something (DS) network which includes the transport scheme (Scenario C in WebTAG)

Equation 1 above does not satisfy ceteris paribus condition that is required to use the rule of the half principle, however the above equation can be rewritten as:

$$\begin{aligned} &= (T0 \text{ on DM} - T0 \text{ on DS}) - (T1 \text{ on DS} - T0 \text{ on DS}) \\ &= \text{Benefits of the transport scheme in isolation} - \text{Transport external costs} \quad (2) \end{aligned}$$

Where

T0 on DS is the total trip costs calculated from assignment of the trip matrix without dependent development but with the transport scheme (Scenario D in WebTAG)

WebTAG A2-3 takes transport external costs away from above equation and estimates total development benefits by comparing transport external costs with planning gain and other externalities. Therefore total development benefits according to WebTAG is

$$= \text{Planning gain} - \text{Transport external costs} - \text{Other externalities} \quad (3)$$

WebTAG A2-3 provides more details on how to estimate the first two components in the development benefit formula (3). Planning gain is the increase in value of the development land unlocked by the transport scheme (for example changing from agricultural use to housing). The transport external costs calculation in WebTAG A2-3 has been derived by assuming that number of trips between an origin and destination pair is the sum of the existing trips and the development trips. WebTAG requires that the derivation of both without and with dependent development scenario trip matrices are constrained to the planning projections (population, households, employment, workers) and trip ends provided in the national data set, National Trip End Model (NTEM). This process reduces the growth in the number of trips generated by existing land use to compensate when dependent development is added. The TEC component is then likely to be negative particularly when existing trips are reduced on congested parts of the network and the transport scheme provides capacity for the new development trips: it should be noted that the TEC component can be a large negative value but as it is subtracted from the planning gain it will result in a large *positive* development benefit. Other externalities are not dealt with in the guidance.

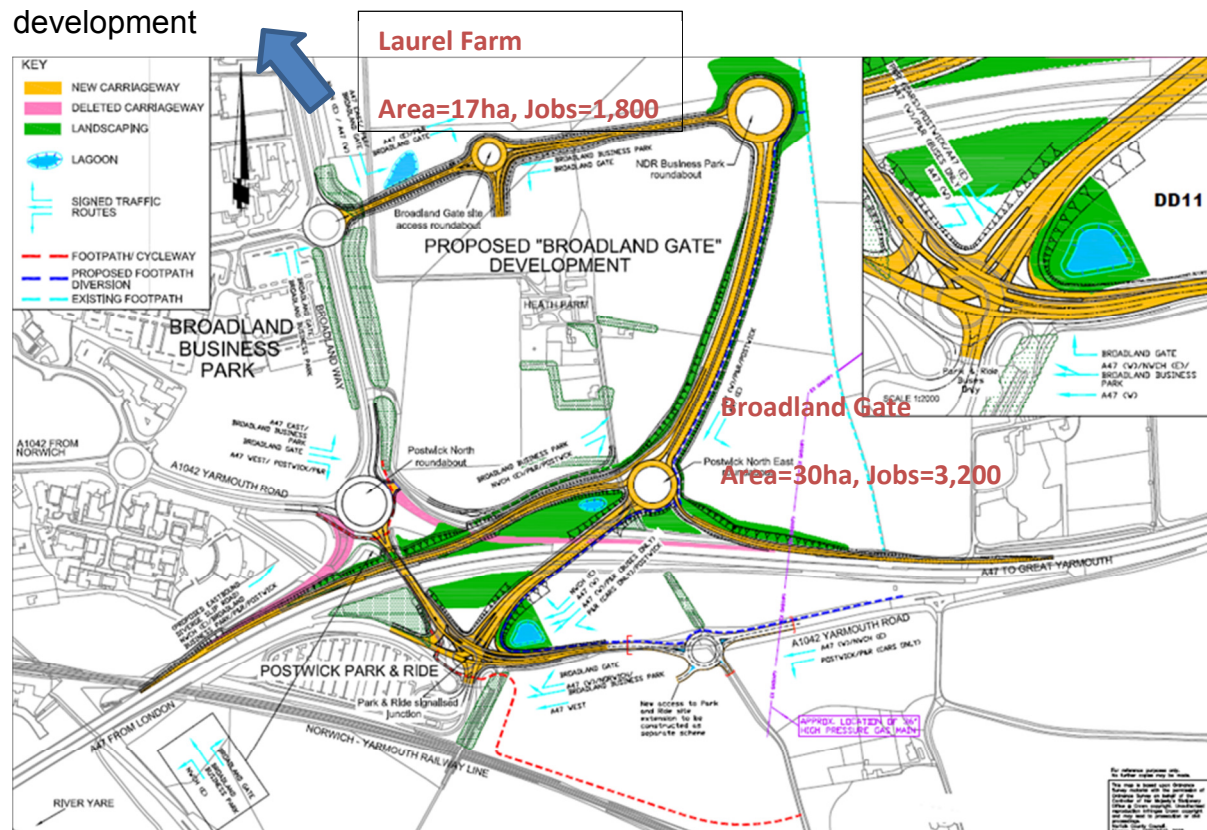
In addition to the benefits of the transport scheme in isolation, planning gain and transport externalities, developments that are aimed at job creation will contribute significant GVA benefits to the overall economy. There is no

guidance in WebTAG for the derivation of GVA benefits or how they could be included in appraisal.

### 3. EXAMPLE APPLICATION

The WebTAG method for the appraisal of dependent development was applied to a major junction improvement on the A47 trunk road junction to the east of Norwich, UK, which already suffers from significant traffic queues and delays. A large amount of employment development is proposed at this location comprising 47Ha of employment and mixed use development which is capable of creating 5000 jobs. To accommodate this development and the traffic that it would generate a new junction configuration was designed that would also protect the operation of the trunk road. As such the development is dependent upon the implementation of the transport scheme and the highway authority made the implementation of a highway improvement a condition of approving development.

Figure: A47 Postwick Junction Improvement to accommodate new development



© Crown copyright and database rights 2012, Ordnance Survey 100019340



The transport and development benefits estimated using the methods described above are set out in the table below.

Table: Costs and benefits of the Scheme

	<b>Costs and benefits</b> <b>(£m, 2010 prices discounted to 2010)</b>	
	<b>Cost</b>	<b>Benefits</b>
Transport Scheme	Present value of costs: 25	Present value of benefits: -74
Development	Development cost: 88	Planning gain and TEC: 494 GVA: 378

The transport scheme benefits were based on the trip matrix excluding the new development trips in accordance with the WebTAG method (using scenarios A and D). As the scheme imposes additional journey time for existing traffic this results in negative benefits. The resulting headline BCR is consequentially negative, -2.93. This would be a common outcome for new development accesses in many situations, but of course does not account for the new development trips and the associated benefits.

The development benefits that were calculated (£494m) comprise mainly the TECs and planning gain (derived from WebTAG scenarios C and D), and these substantially outweigh the negative transport benefits for existing users. Mott MacDonald's Transparent Economic Assessment Model (TEAM) approach was used to calculate additional GVA benefits of £378m, though this cannot simply be added to the transport and development benefits.

#### 4. PROBLEMS WITH THE METHODOLOGY

This section highlights problems with the application of the methodology and the presentation of the results and where changes are required to the guidance so it can be applied to a wide range of developments. Also there are some areas in the guidance where there needs to be more clarity.

##### 4.1 Dependency Test

The tests to determine whether development is dependent on a transport scheme required in WebTAG compare model output on network performance between Scenario A above and Scenario B (scenario B is with the new development but without any form of transport intervention). Since model runs

for both scenarios are constrained to NTEM and with variable demand modelling applied, the comparison of outputs may not highlight the changes expected in the guidance. The guidance suggests that sharp changes in journey times or junction delays with the dependent development added may be taken as evidence of dependency, but in complex networks the new development trips may displace existing trips in the assignment process making it difficult to firmly establish this evidence from the model runs.

In some circumstances the dependency may be directly imposed by the responsible highway authorities based on their experience of existing network conditions and a dependency test should not be required. The guidance does not reflect such instances and it is recommended that it should recognise these circumstances which may be a more pragmatic way of establishing dependency.

#### **4.2 Effect of Controlling to Planning Projections (NTEM)**

The impact of controlling to NTEM can be substantial in the calculation of transport external costs depending on the size of the development and the area over which the control is applied. This process reduces the growth in the number of trips generated by existing land use to compensate when dependent development is added and may result in reductions in congestion in parts of the network. The key issue is that the control area should be sufficiently large to cover the planning area in which the dependent development is a part, with trip end totals over this area used as a control rather than applied at disaggregated zonal level. Given the importance of this process, it is considered that this should be addressed in the guidance.

Whilst the guidance is clear in its requirement for controlling to NTEM, there is the question of whether all of the dependent development could be achieved within the control area in the absence of the spatial allocation to the dependent development sites. This aspect is also referred to as additional impact or *additionality* of a development and it is considered that this too should be addressed in the guidance.

#### **4.3 Assessing Benefits of the Transport Scheme**

The procedure assesses the impact of the transport intervention on existing users (i.e. users without the dependent new development). This is irrational in situations where the transport scheme is promoted and required to serve the dependent development rather than as a means to improve conditions for existing users. WebTAG requires the Benefit Cost Ratio (BCR) to be calculated on this basis, but the benefits do not include any benefits for new development trips for which purpose the transport scheme is proposed. As the BCR is usually quoted as the headline for a transport scheme, in cases with dependent development it will be misleading as it excludes all benefits related

to the development trips. Therefore it is considered that the TEC element should be included within the transport scheme benefits or at least shown as potential additional transport scheme benefits.

#### **4.4 Assessing the Benefits of Dependent Development**

There are several issues that need more clarification when calculating dependent development benefits. These are discussed below in detail.

Appraisal period:

Transport projects are generally appraised over a 60 year appraisal period. However it's not clear from the guidance how long the appraisal period should be for the evaluation of TECs. According to equation 2 above, it would appear that TECs should also be assessed for a 60 year period for consistency with the transport scheme benefits. However whilst an assessment period of 60 years is appropriate for the transport scheme, a shorter period of 20 or 30 years would be more appropriate for the development. The guidance should define the appropriate period to use for the calculation of planning gain and TECs.

What benefits should be included in the appraisal?

According to the guidance, TECs should be calculated by taking into account the change in costs such as time, vehicle operating costs, charges, accidents and environmental conditions (noise, air quality and so on). It should also take into account change in revenues for transport providers. As with the assessment of the transport scheme in isolation, the TEC calculation should take into account all the relevant impacts irrespective of whether they are transport, environmental or safety related.

The derivation of planning gain is clear in WebTAG and it suggests the Valuation Office Agency (VOA) land values as a source although local data might provide better estimates that take account of the specific site characteristics and the type of development. The latest version of the guidance makes it clear that the land area to be assessed should include the whole requirements for the development and include elements such as access roads, car parking, gardens and landscaping.

#### **4.5 Non-residential Development Benefits – GVA**

Non-residential developments such as office and industrial developments will generate significant GVA benefits for the economy. GVA benefits could be combined with planning gain to calculate overall development benefits as follows.

$$\text{Total development benefits} = \text{Planning gain} + \text{GVA} \quad (5)$$

However there are several aspects that need more information in relation to the calculation of GVA benefits. These are discussed below.

#### Appraisal period

A shorter appraisal period than used for transport schemes, such as 30 years, should be used for GVA calculations reflecting the 'life' of the development.

#### Development build-up

It is also important to clearly identify how the development builds up and associated job creation takes place. The assumptions should be in line with the approved transport appraisal for the development. Experience suggests that for some developments a stepwise profile may be appropriate while for other developments a linear profile may be appropriate.

#### GVA per employee

GVA per employee by different market sectors can be obtained from reliable sources for a given price base year. However depending on the mixture of productivity levels of the development, it may be sufficient to calculate an average GVA which can then be applied to whole developments.

#### Additionality

The additionality in the context transport dependent developments refers to the percentage of jobs that would not have been created in the absence of the project (the combined development and transport scheme). This is a key input to the GVA calculation. The assessment of additionality in an ex ante appraisal is more difficult than in ex post evaluation, when occupiers and others can be surveyed about what they would have done in the absence of an intervention. The following considerations bear on ex ante appraisal:

- The difficulty of assessing additionality should not lead to an assumption that additionality is zero
- The uncertainties of assessment mean that a conservative approach should be taken under which additionality is assessed at the low point of the plausible range
- Appraisals and evaluations elsewhere form valid experience on which to draw
- Guidance from official bodies should be followed, recognising that general guidance is unlikely on its own to be sufficiently specific to yield conclusions in respect of a particular scheme.

The “Additionality Guide” [Third edition, October 2008] may be followed to come up with an appropriate additionality value if no local or other data is available to assess the additionality for the dependent developments.

#### Discount rate

The Green Book specifies a social discount rate of 3.5%. But for commercial activities a long term real rate of return on commercial investments would be more appropriate which is generally higher than the social discount rate given in the Green Book. A rate of around 6% would be more appropriate (average return on equities in the UK and USA reported in the authoritative Barclays Equity Gilt study, published annually since 1956). Whilst the GVA needs to be earned by commercial investment, and on this basis a higher discount rate would be more appropriate, it is the implementation of the transport scheme that unlocks the land for development for which a social discount rate applies. Therefore in providing GVA benefits alongside the transport scheme benefits two different discount rates are applied and the different assumptions need to be made clear.

#### **4.6 How to Present the Dependent Development Benefit Appraisal?**

The benefits discussed so far can be divided into those attributable to the transport scheme (the benefits with the fixed DM land use), those due to the development (planning gain and GVA) and those that require both (TECs). In addition there will be return on the investment cost paid by the developer (e.g. sale of housing). To understand the full impact of the transport scheme and the development it will be necessary to set out all the benefits and costs of both. Different economic assumptions such as discount rate need to be made clear. Then there is the question of how to calculate the BCR as clearly the BCR based on demand that excludes development trips is irrational. Should the transport scheme benefits include TECs, but if they do then this implies the investment in the development? These difficulties need to be addressed by the guidance and should include an example application and show how the results should be presented.

### **5. CONCLUSIONS**

The assessment of a transport scheme in circumstances when development is dependent on it introduces theoretical constraints. The standard appraisal process requires the same land use assumptions with and without the scheme to isolate the transport benefits of the scheme, but this constant land use assumption is not met with dependent development.

The application of the WebTAG guidance that deals with appraisal in the context of dependent development has revealed aspects that could be made clearer or are not fully addressed. Also the guidance is based on housing development and though it says the methods can be used for other types of

development, it should deal directly with benefits due to employment development.

The modelling approach for dependency testing can, in our experience, produce inconclusive results and the guidance should acknowledge that local experience and the position of local planning and highway authorities may be a better determinant of dependency.

Large values for TECs due to new dependent development trips can be produced by the method that can substantially outweigh the benefits calculated for the transport scheme in isolation with only existing trips with growth applied. Given the scale of these TECs it is important that control to the planning data (NTEM) is carried out over an appropriate planning area that allows for an alternative spatial allocation of development should the dependent development not proceed in the proposed location.

Employment development can generate significant GVA for the economy. A key input to the assessment is the amount of employment that is considered to be additional with the project in place. There is a guide on the values to use though this is not part of the Department for Transport's WebTAG method. There is also a conflict between this concept and that of assuming that development should be controlled to the same planning data, with or without the scheme (and the dependent development). Consequently it is suggested that the GVA be calculated and presented alongside the transport and development benefits, but that it should be made clear that the GVA benefits cannot be added to these.

The 'life' period for the development is also likely to be shorter than the 60 year period for the transport scheme for the assessment of benefits. In addition a commercial discount rate is more appropriate for dealing with GVA benefits.

The standard BCR calculation for the transport scheme only takes into account the benefits of the transport scheme in isolation on existing users and excludes the dependent development trips and is thus likely to misrepresent the true benefits of the scheme. The guidance needs to address how a more representative headline BCR could be calculated and presented given the complications of including development benefits and costs.

## **REFERENCES**

English Partnerships, The national Regeneration Agency (2008) Additionality Guide, Third Edition

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/191511/Additionality\\_Guide\\_0.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191511/Additionality_Guide_0.pdf)

Norfolk County Council/ Mott MacDonald (2013) Postwick Hub Scheme – Economic Appraisal Report

<http://www.persona.uk.com/a47postwick/deposit-docs/DD-362.pdf>

Transparent Economic Assessment Model (TEAM), Mott MacDonald

<https://www.mottmac.com/article/918/economic-research>

UK Department for Transport Guidance, TAG unit A2-3 transport appraisal in the context of dependent development

<https://www.gov.uk/government/publications/webtag-tag-unit-a2-3-transport-appraisal-in-the-context-of-dependent-development>





**Omega Centre  
DfT Consultation Paper  
Appraisal and Modelling Strategy  
Informing Future Investment Decisions  
June 2018**

I am very pleased to offer these comments on behalf of the Omega Centre at Bartlett School of Planning UCL – one of the leading global centres for research and advice on the appraisal of mega infrastructure projects. As requested at the workshop I attended I am also offering some related thoughts in a personal capacity (as among other things co-architect of the first ‘new approach to roads/transport appraisal’ some 2 decades ago!).

We would be happy to present our work to DfT if it would be useful.

Dr Martin Hurst

**General comments**

There is much to welcome in the consultation paper/ the draft webtag revision and the DfT presentations at the workshop. In particular, our research at the Omega centre has identified two overarching lessons from analysis of mega projects worldwide (see <http://www.omegacentre.bartlett.ucl.ac.uk/research/>), which appear to be reflected, at least in part, in your approach:

- The contention that a different approach is needed for mega projects than for smaller infrastructure projects;
- The finding that a pure CBA approach will typically underestimate certain non-monetised impacts, particularly with regard to some environmental, social and regeneration impacts. The concept of adjusted BCA is certainly a worthwhile acknowledgement of the general point here.

We also welcome the acceptance of the degree of uncertainty about future transport technologies.

That said, we would offer the following suggestions for further development:

- 1) The requirements for appraisal of mega projects would benefit from further development. In particular, our analysis strongly indicates: a) that a more continuous approach is required than simply the traditional SOC, OBC, FBC assessment; and b) that appraisal of such mega projects cannot abstract from assessment of the state of local and regional governance (and its shortcomings – e.g. in terms of join up). Furthermore, the transformational nature of mega projects is very hard to capture through conventional appraisal methodologies.
- 2) We have found that a formal multi criteria approach is superior even to amended BCR (as has other research e.g. the UCL/Sintropher Intereg study on projects connecting European regions using innovative transport - [file:///C:/Users/user/AppData/Local/Packages/microsoft.windowscommunicationsapps\\_8wekyb3d8bbwe/LocalState/Files/S0/20902/2017.12.06%20Sintropher%20WP6%20Web\\_001%20FINALWEB\[22261\].pdf](file:///C:/Users/user/AppData/Local/Packages/microsoft.windowscommunicationsapps_8wekyb3d8bbwe/LocalState/Files/S0/20902/2017.12.06%20Sintropher%20WP6%20Web_001%20FINALWEB[22261].pdf)) (NB this study, which looks at 7 light rail/tram projects in northern Europe, including Fylde in Lancashire is worthy of wider reading.) Wide concern about the over reliance on CBA was also reported by a significant number of important practitioners in our research for the ICE. We would suggest at a minimum that the case for MCA analysis to support adjusted BCA be made explicitly – as indeed is allowed for in central guidance on the economic case component of the 5-case model and in the green book

- 3) The policy background to projects and the underlying objective of policy is much more important than has been suggested. Indeed, it has been argued (e.g. by the House of Commons environmental audit committee), that the use of green book analysis can in practice typically be confined to assuring a positive NPV and that decisions between projects thereafter can owe as much to politics as to relative costs and benefits. While this is true for all projects, it is particularly relevant for comparisons between transport modes, for projects which form an important part of regional initiatives such as northern rail link and the transport offer in the Oxford-Cambridge corridor, and for 'transformational' mega projects. There are also considerations here about consistency with the Government's industrial strategy.

This is also a subset of our central finding of the importance in mega projects of the power of context. The tool we have developed, among others for the EIB – Policy Led Multi Criteria Analysis – is highly relevant here.

- 4) We have some scepticism about currently accepted approaches to optimism bias. In particular, there is growing evidence that this can actually lead to cost overruns, as such contingency becomes the new central estimate.
- 5) We are very concerned at the apparent disconnect between transport appraisal and land use planning. This has two potential consequences: a) it can exacerbate societal opposition to projects, thus causing project delay and cost overrun; b) it can lead to duplication and /or inconsistency – e.g. with the requirements of local plan formation and IEA/SEA compliance.

I would also add four personal comments:

- 1) There is widespread concern about the handling in conventional appraisal of 'high consequence, low probability' events – such as black swans. There is growing evidence that approaches which rely on a Normal distribution – such as P50/P90 modelling, expected NPV, and Monte Carlo methods – will underplay such events, given that in practice there are clear indications that true probability distributions are 'fat tailed'.
- 2) While the presentations at the workshop show good awareness of the additions in the new green book with regard to wellbeing and natural capital, the draft guidance does not cross refer to this guidance;
- 3) The guidance is largely silent on issues around access pricing/demand management. While road pricing in a 'non-estuarial' context can I accept only be dealt with at a national level – and has proved intractable even there – issues around pricing for other modes, and on wider demand management options/additions are notable by their absence. This also reflects what some have characterised as a continuing bias towards 'predict and provide'. The point may be particularly relevant for freestanding large projects, where there is more freedom to set bespoke pricing approaches
- 4) There is an urgent need for webtag to incorporate guidance on the approach to climate change adaptation. This includes: floods and surface water issues (and for coastal transport sea level rise and tidal surge); and the impact of rising heat – e.g. through melting of conventional road surfaces, thermal expansion of rails.

## Specific DfT 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?

"People and Place" should be expanded to focus on the extent of achievement of defined policy objectives, not simply identifying and measuring "impacts". There is also a synergy with the "Transformational Investments" theme.

There is a strong case to emphasise more strongly the need to better appraise transport schemes as an integral part of regeneration or growth packages.

On a related topic, the efficacy or otherwise of the current and proposed institutional operating environment, notably for regional/corridor projects, seems to us essential.

The emphasis seems to be on passenger - appraising investment for freight transport appears to have less emphasis?

Assessment of demand management /local charging seems totally absent.

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

Improving the ability of the DfT Model and WebTAG to enable closer and more proactive alignment of transport investment with key national and regional objectives e.g. the Industrial Strategy.

Developing more explicit guidance for the need for more sophisticated approaches to mega projects

## 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.

“People and Place “ should be expanded to focus should be on achievement of policy objectives, not simply identifying “impacts” and should more explicitly look at the interactions with the land use planning system.

How to better appraise transport schemes as an integral part of regeneration or growth packages – and better avoid transport appraisal looking at schemes in a silo. Linked to this, the paper proposes to better assess the benefits of “change in location attractiveness”.

## 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 approach to scenario planning and sensitivity analysis is welcome. That said, the approach to risk in mega projects is undeveloped: key sensitivities include those around the political environment for example.

The use of normal distribution-based techniques such as P50/and P90 and monte Carlo approaches is overplayed, given the apparent predominance in project delivery experience of ‘fat tailed’ distributions.

The fact that complexity increases more than proportionately with size of projects.

### 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??

Suggestions here differ between conventional and mega projects. For the latter we argue that:

- a) Greater recognition of the policy context; and

b) More continuous assessment than is required by the SOC/OBC/FBC approach

are essential.

There are also complex issues surrounding the effective presentation of uncertainty to decision-makers.

## **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.

How to better appraise transport schemes as an integral part of regeneration or area-based growth packages.

Land value capture is covered in the guidance, but the threat of generated land banking is not. There is some evidence for example that the transport announcements in the Oxford Cambridge corridor has led to withdrawal of land from supply, in expectation of greater return once the transport is delivered. Hence there can be a reduction in housing following announcement. This is not simply a UK problem, there is evidence of similar issues in China for example.

The DfT paper's proposal to develop a commonly agreed framework to help people build knowledge about how local economies work and consider the impacts of transport investment on those economies - including case study evidence – is an important priority.

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's integration with other forms of investment: transport is an enabler but also potentially a catalyst within a wider spatial investment package, and although direct cause and effect is hard to establish, transport does have a valid (and perhaps stronger) value as part of a strategic cross-sector package eg growth corridors.

Wider regeneration and growth benefits - going beyond the current “wider economic benefits” – seem to need greater attention. For example on housing there appears to be emphasis on looking at property and land values uplift, which obviously is only part of the housing objectives picture.

Assessing the net impacts to avoid the well-known zero-sum game between areas/cities/regions.

## **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 are not users of webtag- but there seem to be barriers of complexity and lack of understanding of proportionality and flexibilities. The paper's proposals for case studies, short leaflets and “how to” guides look sensible.

The proposed revision of WebTAG guidance, involving stakeholders, is good.

There is a real risk of disconnection between webtag guidance and material required for EIA/SEA compliance and for local plan making.

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

As above.

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.

As above.

### **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.

Guidance on land use and economic modelling to support assessment of transformational investments and investment packages where transport links are only one element.

Simpler approaches at earlier stages in option generation and assessment, such as sifting based on logic and deliverability.

The proposed review of the existing modelling guidance, with opinions and suggestions from a range of stakeholders and practitioners regarding its application - with a view to clarifying flexibilities within the WebTAG guidance and encouraging interpretation and use in a proportionate way.

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

No comment.

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

Modelling of freight seems to merit more attention in the wider UK policy context.

Use of Policy Led Multi Criteria Analysis

Natural capital and wellbeing analysis as set out in the new version of the green book.

Dr Martin Hurst; OMEGA centre, UCL

October 2018

# Appraisal & Modelling Strategy Consultation

## Comments from Oxfordshire County Council

### 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 do reflect the range of challenges which are likely to be faced in appraisal and modelling in the near future.

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

Advice on the appraisal of transformational investments is probably the most pressing of the themes, given the scale of large housing developments that are proposed for the next few years and the number of major infrastructure projects which will need to begin appraisal in the next couple of years, along with advice on developing modelling and appraisal techniques, especially in the light of models using big data and machine learning techniques which are currently being suggested or developed.

The other themes are important to progress, but are not areas where there is a pressing need and a lack of available up to date advice.

### 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 journey improvements – in particular, this should include consideration of improving reliability/reducing variability in journey times which will be likely to play an increasing importance as network-wide congestion becomes more prevalent. Improved journey time reliability should become a first order benefit for appraisal of schemes.

Public Health – the health benefits of active travel modes over motorised have been established for a long time but as yet they are not fully incorporated within the WebTAG framework. The appraisal needs to be expanded to allow for the incorporation of the WHO HEAT process, or similar, as a standard part of scheme assessment to encourage projects to fully embrace their potential to encourage more active travel and to discourage schemes which would result in fewer active trips.

Attractiveness – this is an area which has been active subject for many years and where many approaches have been tried to produce a methodology which would allow the environmental impacts, both positive and negative, of interventions to be fully incorporated. The result of this lack of success is a perceived disconnect between decision makers and the general public, for whom these issues are often paramount. For it to be successful, any approach needs to be both technically sound and to be widely accepted, which will be no easy feat to achieve.

## **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 impact of technological changes such as CAV or MAAS on traffic levels and impacts are currently poorly understood and indeed plausible arguments can be made both for positive and negative impacts.

The development of a set (or number of sets) of coherent scenarios for the future against which business cases can be assessed. This would allow schemes to be assessed on a consistent basis. In the absence of such exemplars there would be a risk that scheme promoters could develop their own scenarios meaning that comparisons between schemes would become difficult or impossible. Carrying out this scenario based assessment would place an increased burden on scheme promoters so, to ensure that this burden does not become disproportionate, it might be necessary to develop a hierarchy of assessments with, for instance, local schemes only tested against a small number of key scenarios whereas nationally important schemes are tested against the full range.

*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?*

With increasing levels of uncertainty, presumably compounding over time, then the timescale over which schemes are appraised also needs to be considered. What value should be placed on the benefits gained in Year 50 of a scheme's life when the uncertainty about the environment at that time are such that it is in all practical terms unknowable? Perhaps the results of an appraisal should be split into short-, medium- and long-term impacts, with an acknowledgement of the increasing uncertainty at each stage? Thus, a scheme might show high positive benefits in the short term, low positive to high positive benefits in the medium term and low negative to very high positive benefits in the long term.

We have become used to a situation where the result of a business case is a single number or assessment (e.g. a BCR of 2.0 or a High vfm rating). In a world where the uncertainties inherent in future prediction were acknowledged then we would need to also acknowledge that such precision is not possible or even desirable. The increased acknowledgement of uncertainty in prediction must, therefore, be accompanied by a more sophisticated method for the presenting of the results of the appraisal and of decision makers in interpreting the outputs. While such a situation may make decision making and prioritising more complex, or less apparently precise, unless such a change is also made then the impact of acknowledging uncertainty are likely to be more negative than positive.

## **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.*

Truly transformational projects have the potential to alter the relationships which underpin trip making behaviour. There is therefore the paradox that for the largest investments, where the highest levels of evaluation and justification might be expected, the true margins for error in estimating impact might be widest.



This needs to be accepted as an inevitable consequence of the scale of impact and not seen as a weakness in the quality of the appraisal that has been undertaken. Appraisals could be carried out as a series of self-contained scenarios, or alternatively through a wide range of sensitivity testing without seeking the false precision of a single predicted value of impact.

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 estimation of wider economic impacts are difficult and complex but should be included in the estimation of major interventions, especially those with potentially transformational impacts, as they are potentially the most important impacts a scheme could give. However, their position within the Value for Money Framework, with their use as an indicative impact to determine the overall VfM category tends to downplay their importance. This in turn makes it more difficult for a scheme promoter to justify the often resource intensive process needed to make an estimate. The requirements in this area are:

- i. More research to determine the underlying relationships between mobility and economic factors such as local GVA, productivity and employment;
- ii. The setting out of straightforward methodologies for estimating these values to reduce the cost; and
- iii. The inclusion of quantified wider economic impacts as a requirement within all Economic Cases.

### **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 barrier is that the WebTAG advice has expanded both in its scope and in the complexity of the techniques set out in the increasing number of advice notes published under the WebTAG banner. Allied to this is the problem of indexing of the notes and it is increasingly difficult to be sure that an appraisal is being comprehensive in its use of the advice.

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

WebTAG presents the methodologies which are appropriate for the largest and most complex of schemes. While it states that the appraisal of any scheme should be proportionate there is little guidance on how this proportionality should be put into practice. Should some units be ignored? Or only applied as a qualitative assessment? Without such guidance there is a natural inclination to include full assessments in all cases, increasing the resources required.

It would be better if projects were sifted into different categories and it was made explicit what was the appropriate level of appraisal expected/required for that category of appraisal. This would guard against unproportionate appraisal. An example of where a similar approach is advocated is in the guidance on producing Monitoring and Evaluation Plans for large local authority schemes. Here schemes are simply divided into one of three categories depending on cost and complexity and the requirements for each of those three categories is set out in a simple and straightforward manner.



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.

WebTAG is presently a set of text guidance. Its location is not particularly logical and is not well indexed. It would be better if it had a website of its own rather than being a minor part of the .gov site and even better if this website was put together in a hierarchical fashion which encouraged users to read the general advice before setting off in using the detailed guidance.

If the full power of the web was utilised then this could be converted into active worksheets which calculated and presented the various assessments. This would ensure that the calculations within the guidance are applied in a consistent fashion and also link though to the various parameters within the WebTAG data sheets.

### **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.

If you are to produce advice on matrix creation and use of MND then this should not be too prescriptive as this could stifle innovative approaches from emerging. The same approach would apply to the use of “big data” methods of model building, and other new approaches such as machine learning, especially when dealing with model calibration and validation challenges.

Scenario approaches provide a way to deal with uncertainty, but before they are made a standard approach then thought also needs to be given, and advice produced, as to how these should be used within the decision-making context. The risk would be that the range of predicted outcomes that could be produced from a range of testing scenarios could be either an excuse for inaction or for “planning by wishful thinking”- the option chosen being the one that works best for a preferred scenario rather than taking account of the range of possible outcomes. It should also be the “best” outcomes can sometimes occur when a scheme goes against the prevailing scenario – in a traffic restraint scenario the most impact could be achieved by a high construction traffic relief scheme. So the range of scenarios used may need to be tailored to the types of schemes being considered, which could present problems for comparison across a national programme.

Need to ensure that the guidance is equally as applicable to the appraisal of schemes which improve conditions for all different modes. Thus WebTAG should be as applicable an approach to a scheme improving cycling conditions or giving bus priority as it is to allowing general traffic to bypass congested roads.

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

Traffic modelling is likely to undergo considerable change and development over the next decade as new methods of data collection become available and new approaches to the development and calibration of models become established. The best way to encourage innovation is to ensure that the guidance that is in place for modelling is flexible enough to accommodate the changes that are almost certain to come.

Another measure would be to develop an assurance process for newly created models, particularly those which are using innovative approaches, that would provide commentary and certification on the soundness of modelling processes, suitability for use and limits to use of models. This could be carried out by a panel of suitable consultants, academics or Departmental staff for which fees could be charged.

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

The biggest problem which faces traffic modellers in the next few years is that the traditional sources of data will cease to be readily available – roadside interviews are becoming difficult to arrange because of police availability and willingness to operate, and also because the congestion which they can engender is no longer considered to be acceptable; travel diaries are becoming increasingly expensive and difficult to arrange and with more selective subjects there could be an increasing issue of representative

ness. These mean that there needs to be a paradigm shift within modelling from the use of small amounts of high quality data as the basis for models to large amounts of lesser quality data. This will make some areas of modelling which have been taken for granted in previous models, such as trip purpose segmentation, much more difficult to achieve and guidance in many areas covered by WebTAG will need to adjust to take this into account.

4 October 2018



# **PA'S RESPONSE TO DFT APPRAISAL AND MODELLING STRATEGY CONSULTATION**

**11 October 2018**

# CONTENTS

1	YOUR REQUIREMENT	3
2	OUR RESPONSES	4
2.1	PRIORITIES	4
2.1.1	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?	4
2.1.2	What considerations should inform the scope and priorities of our strategy, particularly over the first 18-24 months?	4
2.2	PEOPLE AND PLACE: CAPTURING THE RANGE OF IMPACTS RELEVANT TO TRANSPORT POLICY TODAY	5
2.2.1	What should be our priorities for improving the appraisal of people and place and why? [3 max]	5
2.3	REFLECTING UNCERTAINTY OVER THE FUTURE OF TRAVEL	5
2.3.1	What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? [3 max]	5
2.3.2	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
2.4	MODELLING AND APPRAISING TRANSFORMATIONAL INVESTMENTS AND HOUSING	6
2.4.1	What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? [3 max]	6
2.4.2	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?	6
2.5	SUPPORTING THE APPLICATION OF WEBTAG AND MAKING IT MORE USER FRIENDLY	6
2.5.1	What are the main barriers and challenges to applying WebTAG? How do you think these could be overcome?	6
2.5.2	What more could be done to articulate the flexibilities in WebTAG and support scheme promoters apply the guidance?	6
2.5.3	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.	7
2.6	DEVELOPING MODELLING AND APPRAISAL TOOLS THAT MEET USER NEEDS	7
2.6.1	What should our priorities be for improving the development of modelling and appraisal tools and why? [3 max]	7
2.6.2	How can we best encourage innovation whilst maintaining a consistent and robust approach?	7
2.6.3	What new and emerging techniques and methods should we potentially explore and what specific problems might they solve?	7

# 1 YOUR REQUIREMENT

Correctly prioritising the right public sector transport investments requires a comprehensive understanding of the pertinent consequences of each investment being assessed. The WebTAG methodology provides the Department for Transport's (DfT) guidance on how to conduct transport appraisals, including the impact transport has on the economy, environment and society. For this guidance to remain relevant, acceptable and robust for transport planners and decision makers, the methodology for appraising transport investments and the supporting evidence base must keep abreast of rapidly changing technology and behaviours.

You have launched an open consultation to identify priorities for 1) making WebTAG appraisal methodology more flexible and easier to use and 2) developing the modelling evidence base. Specifically, you want consultees to help DfT identify and understand:

- aspects of WebTAG which are not user friendly
- areas where additional evidence data is required over the next 5 years
- best practice of appraisal and modelling across other industries.

You have requested answers to 13 questions by the 15<sup>th</sup> October 2018.

## 2 OUR RESPONSES

### 2.1 PRIORITIES

DfT has identified five key themes and priorities for developing the evidence base and supporting WebTAG users over the next 5 years:

- People and place: capturing the range of impacts relevant to transport policy
- Reflecting uncertainty over the future of travel
- Modelling and appraising transformational investments and housing
- Supporting the application of WebTAG and making it more user friendly
- Developing and maintaining modelling and appraisal tools to meet user needs

#### **2.1.1 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 selection / prioritisation of different types of projects to create a balanced portfolio is an area that our clients find challenging. For example, choosing between a project enhancing customer experience versus a project delivering a safety benefit. Providing additional guidance around how to evaluate the softer benefits will enable better comparability and it would be helpful to have additional commentary from DfT providing their view on how portfolios of projects should be prioritised in each mode.

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

1. Isolated consideration of schemes always risks over statement of the benefits, including benefits that can only be realised because they are enabled by other schemes or benefits that cannot be realised due to blockers elsewhere in the transport network e.g. customer experience will not improve above a certain level until all aspects of a journey are enhanced. We believe that a UK-wide assessment of the potential benefits that could be achieved by transport schemes will provide context for evaluating individual business cases. For example, if the maximum benefit that UK transport could generate from improving customer experience is £100m, it may be unlikely that an individual scheme could contribute 10% of this.
2. DfT business case documentation is currently inconsistent with HM Treasury Green Book structures in several areas. Greater consistency between these approaches, with a clear rationale for where a change is necessary, would be useful and ensure greater comparability between business cases. Nonetheless, we consider WebTAG to be the most developed economic appraisal approach used across the UK public sector. Other departments could benefit from DfT sharing its experience on developing and maintaining this toolkit.
3. Increased guidance on where business cases are required would be helpful. We increasingly see business cases being produced in situations that should potentially be business as usual activities. Clearer guidance on when business cases for different types of projects (e.g. infrastructure, maintenance, operations) are required would reduce this overhead and focus effort and attention on key investment decisions.

## 2.2 PEOPLE AND PLACE: CAPTURING THE RANGE OF IMPACTS RELEVANT TO TRANSPORT POLICY TODAY

Transport policy is increasingly focused on devolution and cities noting that well-connected communities are essential for a healthy society. Transport is a key contributor to this; however, physical infrastructure can have wide ranging implications for health and wellbeing (positive and negative), such as community severance, urban realm, safety, noise and air quality.

Improvements to the built environment can generate value for affected communities, both while travelling and not. DfT is keen that business cases capture all aspects of customer experience beyond just journey time and reliability including ride quality, availability of information, ambiance, productive use of time, crowding, service frequency, safety and landscape. New approaches may be required to model these impacts. DfT is also interested in economic cases providing more granular detail, demonstrating impact at a transport user level.

### 2.2.1 What should be our priorities for improving the appraisal of people and place and why? [3 max]

1. Many business cases only focus on journey time savings because justifying anything more bespoke is harder to evidence robustly and therefore more difficult to take through the approvals process. If the case stacks up with just journey time savings, there is little incentive to do anything else. Mandating that a qualitative assessment of impacts of a scheme is carried out for all projects, even when it may stack up strongly on conventional metrics (e.g. journey time savings), will ensure that business cases comprehensively consider all implications. This reduces the risk that only certain types of schemes get approved and opens the door for more innovative / unique projects. Being able to quantify these items would be even more valuable in supporting the VfM assessment. However, there need to be accepted methodologies and examples for how these can be applied.
2. Customer experience/satisfaction is linked to the end-to-end journey experience. It is difficult to isolate assessment to a specific initiative or scheme. Guidance is required to ensure that this benefit is not over stated.
3. Increased guidance on appraising air quality impact is required.

## 2.3 REFLECTING UNCERTAINTY OVER THE FUTURE OF TRAVEL

The significant shifts we are seeing in transport and wider technology is changing people's travel behaviour, making it difficult to understand and model travel needs in the future eg electric vehicles, mobility as a service and connected and autonomous vehicles. Technology is also influencing where people want to live, shop and work.

DfT is looking at ways they can provide a toolkit for users to select the most appropriate modelling for the size of project and uncertainty involved to contribute to more resilient decision making. DfT is also proposing to more regularly review optimism bias assumptions in guidance based on more extensive project evaluation.

### 2.3.1 What should our priorities be for improving our understanding and treatment of uncertainty in modelling and appraisal and why? [3 max]

1. The guidance states that optimism bias adjustments should be used to complement rather than replace detailed work to identify project specific risks that would support a proper quantified risk analysis. In practice, optimism bias is often used instead of a detailed risk assessment because it is easy and there's a process to follow. This can provide business case users with a false sense of security from what is in essence a finger in the air estimate. It would be good if more DfT-specific optimism bias guidance was provided based on evidence of actual increases in cost estimates seen between SOC, OBC and FBC stages for different project types. Establishing and providing a database for sharing data on other projects would support enhanced risk assessment.

### 2.3.2 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 to adopting a more sophisticated approach	How could these be overcome
The more difficult the approach, the less likely users are to use it	DfT need to provide a clear process, including a well-defined approach for developing assumptions

## 2.4 MODELLING AND APPRAISING TRANSFORMATIONAL INVESTMENTS AND HOUSING

The strategic objectives of many schemes extend beyond journey time savings and are intended to provide structural economic improvements, improving productivity, rebalancing growth and inducing new housing. DfT is looking to make further progress in clearly establishing the pre-requisite factors (eg skills investment, land remediation, creation of enterprise zones) required for a scheme to have transformational impacts.

DfT recognises that there is a range of methods for assessing impact to productivity but some forms of productivity impacts are not captured by existing guidance.

### 2.4.1 What should our priorities be for improving the modelling and appraisal of transformational investments and housing and why? [3 max]

1. Transformational investments should be made to support specific policy / strategic objectives to drive economic change. The economic value of this change should be determined at a policy / programme level. Individual projects that contribute to the realisation of this strategy can then take a share of these benefits. The success of a project will be almost impossible to measure if individual projects independently model these kinds of transformational benefits. The full economic benefits may only be unlocked if all aspects of scheme are implemented. However, transport links are clearly an enabler and research / examples are required to identify how significant or fundamental upgraded / new links were to an area. We agree with DfT's intention to work with other Departments to understand which parts of a package of investments are critical for its success and the timing of those.

### 2.4.2 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?

None identified.

## 2.5 SUPPORTING THE APPLICATION OF WEBTAG AND MAKING IT MORE USER FRIENDLY

As the evidence base and methodology for assessing more impacts of transport investments grow, there is a risk that the appraisal process becomes disproportionate to the scale of the project and overly cumbersome / complicated for a large group of stakeholders.

To increase the usability of WebTAG, DfT is planning to

- develop a set of case studies to share and promote best practice
- increase learnings from divergences between forecasts and outturn benefits
- run WebTAG training courses
- launch 'at a glance' leaflets
- increased guidance on how the combined effect of impacts should be considered.

DfT would like to work with stakeholders to better understand the issues and challenges faced when using and understanding the guidance.

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

Barriers and challenges to applying WebTAG	How could these be overcome
WebTAG does not readily support non-standard transport projects (beyond regular capital infrastructure schemes) so users must flex guidance to suit requirements	It would be helpful to have some guidance around how best to do this e.g. a list of the most relevant elements that can be flexed and applied outside of the original intended context

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

Regular series of clinics / webinars to explain and articulate different aspects of WebTAG to users across the transport community.



### **2.5.3 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.**

- Central location for all definitions of qualitative scoring (particularly 7-point scale) would help consistent use of this approach. Current guidance seems to spread around different papers. Examples of how the scoring applies to specific schemes would also be useful.
- Structure of the website difficult to navigate and there is insufficient detail provided about each file / paper before opening it.
- Provide a forum for submission of questions and a FAQ section to provide answers to the most commonly submitted questions.

## **2.6 DEVELOPING MODELLING AND APPRAISAL TOOLS THAT MEET USER NEEDS**

DfT acknowledges the challenges and complexities of preparing transport modelling analysis for business cases and intends to add clarity around how to provide evidence and analytical assurance around the chosen approach.

DfT is looking at how it can enhance the capabilities of its own analytical models to better forecast in the face of expanding uncertainty over the future of travel. DfT also intend to provide updated guidance and tools to allow and encourage users to provide transport analysis that embraces uncertainty in business cases. This could be supported by guidance on appropriate scenario testing to evaluate the robustness of a case.

At one end of the scale, there is an option to offer more simple modelling approaches to use at an early stage of options generation and appraisals. At the other end, using advances in data availability and processing capability to provide more detailed and specific modelling.

### **2.6.1 What should our priorities be for improving the development of modelling and appraisal tools and why? [3 max]**

1. Increased post-approval evaluation of projects through implementation and operation to inform future modelling methods. Establishing an evaluation unit to commence analysis immediately of previous projects will start to yield insight that can be used to inform and iteratively develop a more rigorous future process for assessing success of projects and support the creation of an improved evidence bank.
2. Offering simpler modelling approaches and examples covering a range of different project types and sizes.

### **2.6.2 How can we best encourage innovation whilst maintaining a consistent and robust approach?**

- Existing modelling approaches are focused around value of time calculations. Greater connectivity and future automation technologies mean that the time spent travelling is not necessarily lost. More research and case studies on how different values of time should be applied could support innovative transport solutions.
- Many business cases only focus on journey time savings because justifying anything more bespoke is harder to take through the approvals process. If the case stacks up with just journey time savings, there is little incentive to do anything else. This risks only a certain type of scheme is generally getting approved and it may be a blocker for more innovative / unique projects. If you want people to quantify all the potential benefits of a transport initiative, there must be established methodologies and examples for doing it.
- Provision of a central set of assumptions by DfT would ensure consistency across all transport authorities. For example, providing UK-wide assumptions about electric vehicle take-up would ensure that business cases consistently respond to a central view of growth in this mode.

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

- System of systems approach. The often-narrow focus of a business case can result in problems being shifted elsewhere (geographically or modal) rather than resolving the underlying issues. For example, an extra escalator in a station may clear congestion in one area but contribute to a bottleneck elsewhere.
- Equally, multiple separate projects may be underway, targeting the same benefits. Increased visibility of other change projects being considered would help ensure that benefits are not being double-counted. DfT should investigate how it could provide this visibility.



## About PA.

An innovation and transformation consultancy, we believe in the power of ingenuity to build a positive human future in a technology-driven world.

As strategies, technologies and innovation collide, we turn complexity into opportunity.

Our diverse teams of experts combine innovative thinking and breakthrough technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

We are over 2,600 specialists in consumer, defence and security, energy and utilities, financial services, government, healthcare, life sciences, manufacturing, and transport, travel and logistics. And we operate globally from offices across the Americas, Europe, the Nordics and the Gulf.

**PA. Bringing Ingenuity to Life.**

## Corporate Headquarters

10 Bressenden Place  
London  
SW1E 5DN  
+44 20 7730 9000

## [paconsulting.com](http://paconsulting.com)

This report has been prepared by PA Consulting Group on the basis of information supplied by the client, third parties (if appropriate) and that which is available in the public domain. No representation or warranty is given as to the achievability or reasonableness of future projections or the assumptions underlying them, targets, valuations, opinions, prospects or returns, if any, which have not been independently verified. Except where otherwise indicated, the report speaks as at the date indicated within the report.

**<b>All rights reserved**

**<b>© PA Knowledge Limited 2018**

This report is confidential to the organisation named herein and may not be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical or otherwise, without the prior written permission of PA Consulting Group. In the event that you receive this document in error, you should return it to PA Consulting Group, 10 Bressenden Place, London, SW1E 5DN. PA Consulting Group accepts no liability whatsoever should an unauthorised recipient of this report act on its contents.



TASM

Department for Transport

Great Minster House

33 Horseferry Road

London

SW1P 4DR

[TASM@dft.gov.uk](mailto:TASM@dft.gov.uk)

Your ref:

Our ref: TN/A891

Date: 15<sup>th</sup> October 2018

*Letter sent by e-mail*

Dear Sirs

**Re: Appraisal and Modelling Strategy: Informing Future Investment Decisions (June 2018)  
Consultation Document**

Thank you for providing the Peak District National Park Authority with the opportunity to comment on the Appraisal and Modelling Strategy: Informing Future Investment Decisions (June 2018) consultation document. Whilst we appreciate that you have set a series of questions in relation to the consultation document, these do not offer the opportunity to fully respond to the consultation in relation to either the National Park, or the Statutory role of the Authority. Therefore, our response takes the form of a letter, through which we hope to provide a more detailed response to the Department's consultation.

The National Park Authority's response is split into three parts: -

- i) An explanatory section in relation to National Parks and the role of the Peak District National Park Authority
- ii) General comments in relation to the Appraisal and Modelling Strategy
- iii) Specific comments in relation to the Appraisal and Modelling Strategy

**National Parks and the role of the Peak District National Park Authority**

The Peak District National Park was the first of the UK's National Parks to be designated, in 1951. The Peak District National Park Authority has two statutory purposes as set out in the National Parks and Access to the Countryside Act (1949) and restated within Section 61 of the Environment Act (1995). These purposes are: -



- i) To conserve and enhance the natural beauty, wildlife and cultural heritage of the National Park, and
- ii) To promote opportunities for the understanding and enjoyment of the special qualities of the National Park.

The two purposes have equal weight, except in cases where there is conflict between them. Should this occur, then the first purpose takes precedence (this is known as the Sandford Principle<sup>1</sup>). Section 62 of the Environment Act (1995) also places a statutory duty on National Park Authorities that they should seek to foster the economic and social well-being of communities within the National Park.

In addition to the purposes and duty relating to National Park Authorities, Section 62 of the Environment Act (1995) places a statutory duty on other relevant authorities undertaking work affecting land within a National Park to have regard to National Park purposes. In the context of any work affecting land within the Peak District National Park, this duty applies to Network Rail, Highways England, sub-national transport bodies, city regions, plus local highway and transport authorities.

The Peak District National Park is crossed by the A628 Trunk Road and the Hope Valley (Sheffield to Manchester) Railway, whilst the National Park boundary incorporates land from within seven different highway authority boundaries<sup>2</sup>. The National Park Authority is the planning authority for all land within its boundary, irrespective of other authority boundaries.

#### General comments in relation to the Appraisal and Modelling Strategy

In the main, our comments are in relation to the lack of appropriate coverage of National Parks and other protected landscapes within the appraisal process, and the difficulty in assigning appropriate value to National Parks when assessing potential impacts and benefits. There is an historic and consistent approach to safeguarding National Parks from major development, and in particular in relation to transport schemes.

This approach is upheld within the Defra: English National Parks and the Broads UK Government Vision and Circular 2010 (paragraph 85) and the National Planning Policy Framework 2018 (paragraph 172). Similarly, the Environmental Impact Assessments regulations (2017) require that development within National Parks that does not fall under the General Permitted Development Order requires EIA screening.

In our experience, the current appraisal methods seem unable to easily ascribe a realistic value and importance to National Parks or to provide a balance between benefits and impacts in relation to the two national park purposes; whilst having regard to the Sandford Principle. Similarly, National Parks often contain land that is the most important in providing ecosystem services to the wider urban population and to society as a whole. Currently, the appraisal process is unable to take account of and quantify the individual and cumulative impact of transport schemes on the delivery of these benefits.

There is also a lack of knowledge overall, of the impact of major schemes within National Parks on the experience of users of the National Park, and how this affects their willingness to continue visiting. For example, the introduction of a major new road or railway, whilst potentially allowing

---

<sup>1</sup> Department of the Environment (1976), Circular 4/76: Report of the National Park Policies Review Committee

<sup>2</sup> Barnsley Metropolitan Borough Council, Cheshire East Council, Derbyshire County Council, Kirklees Council, Oldham Council, Sheffield City Council and Staffordshire County Council

for easier access, will in all likelihood bring visual and auditory impact, whilst severing footpaths and cycle routes. The knock-on effect could be to reduce the enjoyment of the visitor to that part of the National Park, leading to a disincentive to visit and a subsequent reduction in visitor numbers to that location. This is likely to impact the rural economy, which is to a large extent dependent on the tourist industry. Such impacts may vary from National Park to National Park and even within individual National Parks; dependent on the popularity of the area and the perceived impacts. To our knowledge this is not accounted for when assessing scheme impacts within National Parks.

We would wish to see the appraisal process take full account of the national importance of National Parks (areas designated on account of their natural beauty, wildlife and cultural heritage) when assessing transport schemes. This may require an assessment of the value of that National Park to the local, regional and national economy, along with any impact that the scheme might bring. Consideration would also need to be given to the value of the well-being and societal benefits of the National Park. There would also be a requirement to consider the added value of the ecosystem services to wider society. It is only through a considered appraisal of the impacts of a major transport scheme on the National Park, that an appropriate assessment of impact and benefit can be achieved.

### Specific comments in relation to the Appraisal and Modelling Strategy

## **Chapter 1 – Introduction**

### **Recent progress**

**Page 12, Paragraph 1.9** – the third bullet point refers to updates to environmental values used in appraisal, in relation to air quality and noise; this is a positive approach. However, there is no clear assessment of impacts on users of National Parks, where new schemes bring additional noise and a reduction in air quality. Such impacts can negatively impact on the enjoyment of the National Park by visitors, particularly where walking or cycling routes cross or parallel new roads or railways. Similarly, the appraisal process needs to take full account of the impact of airborne pollution and noise on protected habitats and species. This is a particular concern for those areas of National Parks that are covered by SSSI and Europa 2000 designations in relation to internationally rare or threatened species.

### **Ongoing work**

**Page 13, Paragraph 1.10** – the third bullet point refers to work to incorporate valuations of transport specific landscape impacts. This is a positive approach to take; however, there will be a need to take account of the value of landscapes within National Parks and Areas of Outstanding Natural Beauty. Whilst not wishing to undervalue any landscape, both National Parks and Areas of Outstanding Natural Beauty are designated on account of their landscape features, which are deemed to be of national importance. Therefore, in ascribing value to any landscape, those within National Parks and Areas of Outstanding Natural Beauty should be ascribed the highest values possible.

## **Chapter 2 – The role of WebTAG in decision making**

### **Impacts considered in appraisal**

**Page 16, Paragraph 2.9** – refers to the qualitative monitoring of landscape impacts. It is important that where an assessment is being made of landscape impacts within a National Park or Area of Outstanding Natural Beauty, that regard is given to the national importance of that landscape (see previous comments in relation to paragraph 1.10).

## Examples of scheme impacts

**Page 17, Example bypass scheme** – as referred to above consideration needs to be given to the national importance of the landscape of the referenced Area of Outstanding Natural Beauty. As part of the appraisal, this should include an assessment of impact of the scheme on views into and from an Area of Outstanding Natural Beauty. It is unclear that under the current appraisal system that such an assessment is easily made, or that appropriate weight is given to such impact.

## Assessing Value for Money (VfM)

**Page 17, Paragraph 2.13** – refers to the difficulty in assessing monetary values to things such as townscape and landscape. It is important that sufficient weight is given to the national importance of National Parks and other protected landscapes, when making such assessment. Similarly, the economic value, recreational benefit and the value of associated ecosystem services of a National Park should also form part of the assessment where a scheme is likely to affect land within a National Park.

## Making the case for investment across the country

**Page 18, Paragraph 2.16** – the third bullet point refers to time valuations and the approach of not distinguishing between earners irrespective of their earnings. This is sensible; however, there is an argument to be made for differential assessment of the value of Green Capital and Ecosystem Services in relation to rareness of habitat, and the value of the societal benefits that occur as a result. At present the value of such benefit appears not to be adequately assessed within the appraisal process. In order to fully recognise any potential impacts of transport schemes on such benefits, they need to be better understood.

Similarly, it cannot be assumed that each bit of green space offers the same benefit. For example, a lowland, intensively farmed field will offer wider societal benefits, including food production and water retention. However, the upland moors may offer a range of benefits including recreational opportunities, carbon sequestration, water retention, improved water quality, clean air, plus offer a habitat for pollinating insects. Not only does this upland area offer a wide range of benefits, but it is generally a rarer and more fragile habitat, so therefore is more susceptible to damage.

## Flexible and proportionate guidance

**Page 19, Paragraph 2.19** – refers to a requirement for proportionality in relation to guidance on Wider Economic Impacts. This is welcomed; at present, the approach appears to be one of identifying a solution prior to fully understanding the problem and the knock-on benefits and impacts. For example, in the case of the Trans Pennine Tunnel Scheme, there seems to be an assumption that *“this is the right scheme, now let’s go out and find the evidence to support it”* rather than *“this is the problem, what is the best way of solving it and what would be the benefits and impacts across a range of options – including rail”*.

## Chapter 3 – Changing appraisal environment

### Priority themes for the next five years

**Page 21, Paragraph 3.10** – the third bullet point refers to the Trans Pennine Tunnel Scheme. Whilst this response also refers to the scheme using this name, it now appears to be largely inaccurate. The name dates back to the time when a full tunnel wholly under the Peak District National Park was being planned. As this is no longer the case, and the suggested scheme will

include an above ground two-lane expressway motorway within the National Park, with only one third of the distance in tunnel, to continue to refer to the scheme by the same name is confusing. Stakeholders involved with the scheme have expressed their confusion at the retention of what is now an inaccurate name for the scheme. For clarity to all, we would suggest that the scheme be referred to more accurately, political sensitivity notwithstanding.

## **Chapter 4 – People and Place: capturing the range of impacts relevant for transport policy**

### **Valuing attractiveness**

**Page 23, Paragraph 4.2** – from experience in working with Highways England and their agents, in relation to traffic impacts, there is not at present, an adequate means of assessing the visual impact of increased traffic on an existing road as a result of nearby road scheme. This is of particular concern, when assessing impact within a National Park or Area of Outstanding Natural Beauty. It cannot be assumed that a proxy impact, such as for noise, is appropriate. This is because the flow of landscape may hide traffic from view, whilst still allowing audible impact. Conversely, the traffic may be inaudible from surrounding land but be clearly visible against the skyline. The makeup of traffic will also be significant; for example, traffic flow with a high proportion of HGVs will be more clearly visible against the skyline than traffic that is more car dominant.

**Page 24, Paragraph 4.4** – refers to the development of tools to robustly assess the quality of the urban realm by those who live in it. This is positive; however, a similar approach should be taken in rural landscapes and particularly protected landscapes to assess their importance to residents, visitors and the nation as a whole.

**Page 24, Paragraphs 4.7 & 4.8** – this is a positive approach. There are a number of well-being and health benefits associated with activity in, and enjoyment of the natural environment. It is particularly important that great weight is given to such benefits in association with National Parks, as they offer opportunities to experience the outdoors in iconic life-changing settings. Not only does this bring benefit to lifestyle and well-being benefits to visitors to and residents of National Parks; they also offer a significant boost to the rural economy, and that of the nation as a whole.

## **Chapter 5 – Reflecting uncertainty over the future of travel**

### **Wider issues**

**Page 30, Paragraphs 5.21 and 5.22** – refers to the need to make adjustments for optimism bias, and the need to disaggregate optimism. This is a positive approach, as is the suggested approach of the better sharing of data on cost over-runs.

There is a danger with the 'Transformational' schemes that the range of models used, and the desire to build the wider benefits case, that there will be the multiple counting of benefits. It is important that a careful approach is taken to ensuring that the cost benefit analysis is accurate and takes a thorough account of impact as well as benefit. Failure to do so runs the risk of the assumed benefits not being delivered along with a knock-on lack of confidence in the process.

## **Chapter 6 – Modelling and appraising transformational investments and housing**

### **Background**

**Page 31, Paragraph 6.2** – see earlier comments in relation to the use of the name of the ‘Trans Pennine Tunnel’ scheme.

**Page 31, Paragraph 6.4** – it’s important that the modelling of such schemes is robust. The scale of transformational schemes means that analysis is based on a number of different models, that do not necessarily produce easily transferable data. The cost of modelling across such wide ranging schemes is also expensive, so there will always be an economic case for a minimalistic approach to modelling. However, in order to fully understand the benefits, impacts and costs of a scheme, it is important that any modelling is thoroughly robust and stands up to scrutiny.

This is of even greater importance where a transformational scheme is proposed within a National Park. Such schemes have to meet the major development test set out in the National Planning Policy Framework 2018 (paragraph 172). In order to do so, the scheme promoters must be able to provide evidence that proves the test has been met. Given the sensitive nature of development in National Parks, it can be expected that such evidence will be open to challenge, and will therefore need to be robust.

**Page 32, Paragraphs 6.6 and 6.7** – the suggestions within these paragraphs are welcomed, but will also need to be aware of the designations ascribed to National Parks and Areas of Outstanding Natural Beauty.

**Page 32, Paragraph 6.10** – whilst we can see the benefits of utilising private sector models, it is important that a consistent approach is maintained. It should be remembered that inaccurate modelling ultimately led to the Highways Agency’s withdrawal of the A57/A628/A616 Mottram – Hollingworth – Tintwistle Bypass scheme in 2009, along with the associated repayment of costs to opponents and supporters of the scheme.

**Page 32, Paragraph 6.11** – as stated previously, it is important that benefits and impacts are robustly assessed, particularly for the ‘transformational schemes’. It is relatively easy to build an aspirational benefits case, but it can be unclear from a stakeholder perspective how accurate the evidence is in support of the quoted benefits. Similarly, there needs to be a real assessment of the cost of impacts on landscape, ecosystem services and enjoyment of the countryside, rather than an acceptance of them as being ephemeral / unmeasurable. This is of particular importance where schemes are being proposed within National Parks or Areas of Outstanding Beauty.

## **Chapter 7 – Supporting the application of WebTAG and making it more user friendly**

### **Building capability**

**Page 7.6, Paragraph 7.6** – we are supportive of this approach.

#### Summary

We feel that the current approach to appraisal doesn’t fully take account of the national importance of National Parks and Areas of Outstanding Natural Beauty. We appreciate that it may be difficult to ascribe appropriate values to landscape, natural beauty, cultural heritage, tranquillity or ecosystem services. However, failure to do so presents a bias in favour of the delivery of schemes within protected landscapes whilst not properly accounting for impacts on them. It should be noted that in assessing schemes that fall within or affect land within a National Park, scheme promoters are bound by legislation to have regard to National Park purposes.

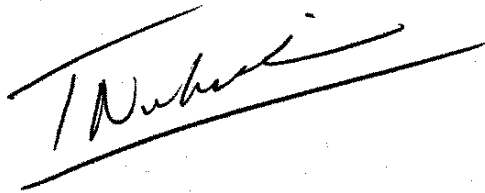
Therefore, we believe that the appraisal process needs to find ways of fully assessing the value of the special qualities of National Parks and other designated or protected landscapes. It is only



through undertaking such an approach that it can be demonstrated that the major development test set out in the National Planning Policy Framework 2018 (paragraph 172) has been met.

I hope that this response is useful to you in updating the approach to the appraisal of transport schemes. If you have any questions about any of the points raised, then please contact me directly.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Tim Nicholson', written over a horizontal line.

Tim Nicholson  
Transport Policy Planner

# Annex A: Full list of consultation questions

Name : Phil Abbott

Responding as an individual.

Co-author:

Department of Transport and Welsh Office (1988). Calculation of Road Traffic Noise. HMSO, London.

My response is related to Question 10 of the Consultation:

*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.*

In particular to WebTag's valuation of environmental noise impacts from road traffic on annoyance and sleep disturbance.

The current WebTag Noise Chapter 2 in WebTag Unit 3: *Environmental Impact Appraisal* is not transparent and likely to cause confusion. In addition, the method for assessing sleep disturbance may under value the impact from road traffic at sites in the vicinity of motorways.

To overcome these problems WebTag should adopt the noise indices  $L_{den}$  and  $L_{night}$  as the preferred indices for valuing environmental noise impacts, not  $L_{Aeq, 16h}$ , particularly as the dose response relationships which underlie the methodology are expressed using these indices. The existing noise models used for calculating noise levels can either directly calculate these noise indices as in the case for rail and aviation or be converted to these indices in the case of road traffic using the recommended method developed for noise mapping<sup>1</sup>. By presenting marginal values in terms of  $L_{den}$  or  $L_{night}$  the valuation of noise impacts from schemes which include both motorway and non-motorway roads can be assessed. Currently assuming the relationship between day and night traffic flows for motorways follows that for non-motorways may on average under estimate night noise levels by about 6 dB.

Ultimately, leaving aside issues relating to Brexit, the UK will adopt the EU common approach to calculating noise impacts from transportation, CNOSSOS-EU. Adopting the approach suggested above will prepare stakeholders for such a transition.

i. <sup>1</sup>Abbott, P.G, Stephenson, S.J, (2006) "Method for Converting the UK Road Traffic Noise Index LA10,18h to the EU noise indices for noise mapping" TRL Ltd and Casella Stanger report prepared for Defra

A further issue that needs to be clarified more explicitly concerns the final sentence in paragraph 2.2.17:

*For both road and rail, the night noise assessment should be based on freefield noise levels.*

This might be interpreted that all other noise assessments are not freefield which is incorrect.

The sentence should be deleted and a clear statement earlier in the noise chapter should make it clear that all noise assessments assume freefield conditions which is defined as the received noise at the facade ignoring any reflected noise from the facade itself.

I hope the above advice is clear but if you require further clarification please contact me.

Best Wishes

Phil Abbott

# Technical Note

**Project:** Appraisal and Modelling Strategy: Informing Future Investment Decisions

**Subject:** Consultation Response

<b>Client:</b>	Department for Transport TASM	<b>Version:</b>	A
<b>Project No:</b>	N/A	<b>Author:</b>	Dan Bent & Tom Millard
<b>Date:</b>	15th October 2018	<b>Approved:</b>	Mark Nettleton

This note sets out the PJA Group<sup>1</sup> response to the Department for Transport (DfT) 'Appraisal and Modelling Strategy: Informing Future Investment Decisions' May 2018 consultation document. It does not respond to every question in the consultation, instead it focuses on the areas we feel we can contribute most to the development and shaping of future guidance and the research that underpins it.

Our response is split within the table below, into five technical areas:

- Microsimulation modelling;
- Mesoscopic modelling;
- Isolation modelling;
- Proportionality/appropriate tools; and
- Valuing urban realm.

The relevant consultation question that each section of text is responding to is outlined in the right-hand column of the table as we feel there is much overlap between the questions.

We hope that you find our response useful, and we will be happy to discuss any part of this with you.

Response	Consultation Question
<p><b><u>Microsimulation</u></b></p> <p>The WebTAG guidance (Unit 3.1 in particular on Highway Assignment Modelling) generally focuses on the development and calibration/validation of large, strategic models. This has its merits and is a suitable reference when large projects require vast area-wide models to be produced. However, the guidance does not really cater for smaller sized projects where smaller networks are required and strategic models are not appropriate/viable.</p>	<p>8 – “barriers to applying WebTAG”</p>

<sup>1</sup> Phil Jones Associates Limited (<https://pja.co.uk/>) and Multimodal Limited (<https://www.multimodaluk.com/>)

Response	Consultation Question
<p>For these transport projects, microsimulation software is commonly used. This allows a range of network layouts and features to be modelled, which can accommodate all modes of travel and simulate the complex interactions between them. The ability to model demand, supply and behaviour in detail, along with powerful visuals and a range of outputs makes microsimulation a leading transport planning tool.</p> <p>Microsimulation software has advanced over the years and the ability to model pedestrians and their interactions with vehicles has led the various programmes to be used for more diverse projects – shared space, public transport interchanges, freight modelling, all with the ability to output results regarding capacity improvements, travel times, network performance etc. These are big developments on the software and make it more than just a tool for assessing road network improvement schemes.</p> <p>However, aside from TfL’s Modelling Guidelines, there is no explicit supporting guidance on the calibration and validation of microsimulation models. Over the years, the DMRB / WebTAG criteria for strategic modelling has been adopted and used in the calibration and validation of microsimulation models, as this has always been the sole source of guidance outside of TfL. Whilst this provides a backstop for certain modelling criterion, there is still some ambiguity in the guidance, particularly when it comes to smaller models. This can lead to delays in the approval process during external audits, which all affect the overall project delivery.</p> <p>It is suggested that DfT develop modelling guidelines for applying other modelling techniques (including Microsimulation and Mesoscopic modelling) through supplementary units within WebTAG. These would stipulate the key differences to Unit 3.1 and provide parameters/values/criteria appropriate for producing acceptable models to the DfT using these alternative techniques.</p> <p>A few examples of differences / elements for DfT to consider include:</p> <ul style="list-style-type: none"> <li>• The collection of observed journey time data (required length of routes, number of samples);</li> <li>• Journey time validation criteria – as the routes collected will be short, is the 60s criteria suitable?</li> <li>• The consideration of adding additional checks are recommended, including looking at the range of observed data to see if the modelled times fall within that; and</li> <li>• Model convergence criteria – for microsimulation model is particular, the current parameters are not really suitable and other criteria should be considered.</li> </ul> <p>As a way forward with developing guidance for other modelling techniques, it is suggested that DfT hold workshops with a number of Transport Planning/Modelling Companies to identify key areas for developing clearer guidance and/or establish a team made up of people from different consultancies to develop the appropriate documentation.</p> <p>The consultation document also makes reference to improving understanding of cyclist behaviour and trends. If DfT were to develop modelling guidance for other modelling platforms this would allow microsimulation software to be used for the analysis of cyclist schemes, both in terms of the effects on the cyclists and general traffic.</p> <p>The use of microsimulation software for developing evidence cases is growing due to their range of outputs and the ability to model multiple scenarios, which can include varying levels of congestion. These varying outputs are</p>	<p>13 – “new and emerging techniques and methods”</p> <p>8 – “Barriers to applying WebTAG”</p> <p>9 – “articulate the flexibilities in WebTAG”</p> <p>10 – “improve the way WebTAG is presented”</p> <p>3 – “improving the appraisal of people and place”</p> <p>2 – “inform the scope and</p>

Response	Consultation Question
<p>essential for understanding the proposal impact and therefore ensuring that these models are developed against robust and acceptable criteria should be a key focus for DfT.</p> <p>The consultation references of a desire to understand the Values of Travel Time Savings (VTTS) in congested conditions. If DfT actioned the production of further guidance for other modelling packages, then microsimulation in particular would be advantageous for providing outputs related to congested conditions. Combinations of mesoscopic and microsimulation is also possible for larger networks, with particular areas of interest able to be modelled in more detail inside of a larger network model.</p>	<p>priorities of DfT strategy"</p> <p>3 – "improving the appraisal of people and place"</p>
<p><b><u>Mesoscopic</u></b></p> <p>Mesoscopic modelling allows the modelling of much larger networks, whilst retaining the ability to simulate dynamic assignment and the effects of phenomena such as blocking back or complex variable traffic signalling strategies on travel times. Another benefit of the mesoscopic approach is vastly reduced computation times for simulation runs, as well as the ability to model in reduced detail, leading to greater efficiencies in time taken for model creation, convergence and validation.</p> <p>Mesoscopic simulation also provides a convenient way to calibrate networks due to the limited number of parameters. The simulation is more stable with respect to minor network changes which also means that phenomena such as gridlocks, where vehicles block each other's way, occur less frequently. This also helps in the validation of the model, with criteria currently based on WebTAG guidance.</p> <p>Users are also able to combine mesoscopic and microscopic simulations as a hybrid simulation within the same interface. For example, if users need to go into detail at specific corridors or junctions, these can be defined as sections of the mesoscopic simulation in which all modes of transport and their interactions – including pedestrians and cyclists – will be simulated at a microscopic level, with a variety of results able to be output at varying levels of detail.</p> <p>Hybrid simulation allows traffic management and scheme mitigation measures to be assessed at a much larger scale. The simulation allows users to investigate the cumulative effects of operational interventions in journeys – for example, by opening the hard shoulder to traffic, introducing variable speed limits, or creating systems that influence road users' choice of route, as well as the implementation of new junction layouts and signal control strategies. Hybrid simulation in turn allows for finely granulated evaluations and refinements of planned measures.</p> <p>Mesoscopic modelling appears to have been around for a few years but finding examples of its use in large scale projects is hard to come by. Even more recently, hybrid meso-microsimulation models are becoming more popular and given its nature as a cross between large strategic models and smaller microsimulation models, further promotion/use cases/guidance for this technique should be considered by DfT as this may provide a more suitable alternative for Clients/Stakeholders with projects that require network modelling, but not at a strategic level. It is therefore an appropriate tool for forming the basis of an economic appraisal that considers not only the established monetised impacts but also some of the wider economic impacts where no explicit land use</p>	<p>12 – "encourage innovation"</p> <p>13 – "new and emerging techniques and methods"</p> <p>9 – "articulate the flexibilities in WebTAG"</p> <p>10 – "improve the way WebTAG is presented"</p>

<p>changes are integrated into the transport model such as: static clustering productivity impacts; labour supply impacts; and dependent development induced investment.</p>	
<p><b><u>Isolation Models</u></b></p> <p>A further suggestion for DfT is the role that smaller traffic modelling techniques for assessing the impact of transport schemes. Whilst packages such as ARCADY, PICADY, LINSIG and TRANSYT are not the right tools for undertaking economic assessment on their own, they all have their place in assessing proposals such as aiding initial scheme design and the development of larger transport models.</p> <p>At present, guidance on the suitability / validation criteria for these modelling packages tends to come from the manufacturers of the software. However, it is suggested that DfT consider producing formal guidance to cover these modelling packages, in a similar way that TfL do for any transport modelling projects that are undertaken in London.</p> <p>This will allow all modelling steps and packages that inform an economic case in some way to be appropriately development and validated against consistent, national standards.</p>	<p>9 – “articulate the flexibilities in WebTAG”</p> <p>10 – “improve the way WebTAG is presented”</p> <p>8 – “Barriers to applying WebTAG”</p>
<p><b><u>Proportionality / Appropriate Tools</u></b></p> <p>From a transport modelling perspective, making the guidance more flexible in scheme appraisal should be one of the key focus areas for DfT. Greater clarity is needed on the modelling approach to take for small to medium sized projects, particularly where local authorities cannot afford larger scale highway assignment models. Alternative methodologies and modelling techniques need to be described and appropriate guidance provided on their use, to allow these techniques to achieve WebTAG compliance.</p> <p>To help with overcoming some of the clarity issues and providing a clearer methodology for transport projects, we propose providing a clear flow-chart / diagram / traffic light system which chooses the most appropriate modelling technique depending on anticipated size/cost of scheme (strategic / highway assignment – large, mesoscopic – medium, microsimulation – small)</p> <p>By separating the modelling choices available into clear, distinct choices, this would allow scheme promoters and consultants working for them to understand the level of modelling required for their proposal (which can feed into viability of scheme appraisals etc.)</p>	<p>9 – “articulate the flexibilities in WebTAG”</p> <p>10 – “improve the way WebTAG is presented”</p> <p>8 – “Barriers to applying WebTAG”</p>
<p><b><u>Valuing Urban Realm</u></b></p> <p>The value of ‘movement’ is well covered in WebTAG, most notably through the value of travel time savings, however the value of ‘place’ is not. Whilst there are values for aspects of the pedestrian environment, these are somewhat limited, and the source studies are now 13 years old.</p> <p>Improvements to the public/urban realm are a key part of the transport fabric, both as a standalone scheme or as part of another intervention such as a transport interchange. Improved urban realm can increase the take-up</p>	<p>3 – “improving the appraisal of people and place”</p>

Response	Consultation Question
<p>of active modes with associated health and environment benefits, but it can also offer a welfare effect in itself. New research is required on this subject so that appraisal values can be produced for use in cost benefit analysis in the same way as established monetised impacts.</p> <p>Research by Tom Millard of PJA in conjunction with John Nellthorp and Manuel Ojeda-Cabral of University of Leeds ITS (2018) titled 'What is the value of urban realm? – a cross sectional analysis in London'<sup>2</sup> found there to be, through a hedonic pricing model for the whole of London consisting of 56,000 observations, statistically significant positive relationships between property prices and indicators of urban realm across four areas of evaluation: i) traffic and severance; ii) heritage; iii) open space; and iv) street trees.</p> <p>These results demonstrate that urban realm is valued, however further research is needed to be definitive about the impacts and be able to estimate reliable appraisal values that represent the willingness to pay for urban realm improvements. Areas for future research, based on this paper, include the following:</p> <ul style="list-style-type: none"> <li>• A similar study conducted for regions outside of London;</li> <li>• Use of more detailed explanatory variables, such as street classification/layout, surfacing materials and design quality (likely to be trade-offs between data detail and geographical coverage);</li> <li>• Use of panel data that assesses the impact of different types of urban realm improvement schemes;</li> <li>• Complimentary stated preference studies for calibration and greater flexibility of variables; and</li> <li>• Estimation of the second stage hedonic model, where the implicit hedonic values are used to estimate a demand function for urban realm. This is a theoretically and analytically demanding exercise) but is arguably necessary for the results to be used in welfare analysis/economic appraisal.</li> </ul>	

<sup>2</sup> Presented at International Transportation Economics Association 2018 conference and is available upon request.





## **Rail Delivery Group**

### **Response to Department for Transport Transport Appraisal and Modelling Strategy: Informing Future Investment Decisions**

**Date: October 2018**

## **Rail Delivery Group response to consultation:**

### **Transforming appraisal and modelling strategy – informing future investment decisions**

**Organisation:** Rail Delivery Group

**Address:** 200 Aldersgate Street, London EC1A 4HD

Business representative organisation

**Introduction:** The Rail Delivery Group (RDG) brings together passenger train operators, freight train operators, as well as Network Rail; and together with the rail supply industry, the rail industry – a partnership of the public and private sectors - is working with a plan *In Partnership for Britain's Prosperity*<sup>1</sup> to change, improve and secure prosperity in Britain now and in the future. The RDG provides services to enable its members to succeed in transforming and delivering a successful railway to the benefit of customers, the taxpayer and the UK's economy. In addition, the RDG provides support and gives a voice to passenger and freight operators, as well as delivering important national ticketing, information and reservation services for passengers and staff. taxpayers and the economy. We aim to meet the needs of:

- Our Members, by enabling them to deliver better outcomes for customers and the country;
- Government and regulators, by developing strategy, informing policy and confronting difficult decisions on choices, and
- Rail and non-rail users, by improving customer experience and building public trust

For enquiries regarding this consultation response, please contact:

#### **Rail Delivery Group**

2nd Floor, 200 Aldersgate Street

London EC1A 4HD

---

<sup>1</sup> *In Partnership for Britain's Prosperity*, RDG (October 2017):  
<http://www.britainrunsonrail.co.uk/files/docs/one-plan.pdf>

## Overview

The Rail Delivery Group (RDG) welcomes the opportunity to contribute to this consultation. The key points of the RDG's response are as follows:

- RDG agree generally with the themes listed as **pressing priorities** and offer only some points to be considered within these priorities;
- Four suggested priorities are made for **People and Places** in the areas of:
  - Rebalancing the economy;
  - non-monetised impacts;
  - capturing increased land use value; and
  - the environmental impacts of schemes.
- The priorities we have given for **reflecting future uncertainty** are:
  - The general state of the economy;
  - the potential for modal switch;
  - the impact of a more developed country; and
  - other comments are also made.
- For the **modelling and appraising transformational investments and housing**, our suggested priorities are:
  - More work and guidance on defining when schemes are, or are not, transformational;
  - the post-assessment of schemes;
  - the proper consideration of the housing market;
  - and identifying causation of increases in land value.
- Some perceived **barriers to using WebTag** are highlighted with:
  - Wider Economic Benefits (WEB);
  - regeneration; and
  - Indirect benefits.
- Three suggested **priorities for improving the development of modelling and appraisal tools** are:
  - A tool to model the performance of rail at a network level;
  - a fresh look at modelling risk and uncertainty in travel behaviour;
  - more investment in studying ex-ante and ex-poste performance of demand forecasts and delivery of scheme benefits; and
  - some ideas for new techniques and methods are offered.

## 1. Priorities

RDG are in general agreement with the listed themes as pressing priorities but believe the following points could be considered within them.

### ***Devolution***

RDG affirms the value of devolving transport powers to more local control. Whilst the principle is supported, a concern within the context under discussion is the potential over time for the gradual degradation of established consistency by divergences developing across modelling and appraisal methods and approaches. This can occur when new and/or separate guidance on modelling and appraisal is issued or supported by the devolved authorities, under the provision of their newly acquired powers. Central government should work to ensure that established guidance is accepted and fully adopted by the devolved authorities. In addition, where it is felt that it fails to take sufficient account of regional differences, a programme of work to make it adaptable, to better reflect more particular local circumstances, should be executed.

### ***Consider accessibility more explicitly***

Accessibility for all does not appear explicitly as a priority but RDG appreciates that it may well be an implicit consideration. Perhaps, however, a more explicit reference could be included, as barrier free accessibility to rail transport is very much a priority for the rail industry. The Department stipulates that considerable infrastructure and ongoing service provision are required, both to provide for and to enable this, in rail schemes and franchise contract specifications.

This needs more careful consideration in appraisals as the requirement tends to push up the relative costs of rail investment within appraisals and make it relatively less attractive when compared to schemes for competing modes where the cost of this provision is a far smaller component, proportionately. That proportion of cost does not necessarily diminish pro-rata relative to the size of the scheme being evaluated and the direct benefits it produces. For example, a proposal for a smaller railway station still needs an accessible method of getting from one side of the tracks to another, regardless of the level of passenger demand. One way to address this is to invent a method that values the benefits from accessibility improvements in money terms, to represent them fully in the BCR.

It is questionable whether the current approach takes full account of the costs of providing for those with impaired accessibility for modes that compete with rail as options. For example, the national cost of provision of the Motability Scheme is £6 billion per year. By providing personal vehicles Motability provides access to road infrastructure for two million eligible people, improving their access to opportunities and facilities. This cost is not counted in the costs of road schemes but without it there would be fewer users of the scheme (and therefore lower benefits). This represents an inherent bias in the appraisal option process in favour of the road mode. RDG contend that this cost of accessibility improvement should be included in the cost component of road appraisals with a view to making a more level playing field where road and rail schemes compete as options.

### ***Cities, towns and urban conurbations – capturing the benefits of bus and tram interchange with rail***

RDG would like to contribute that, within urban models the value of bus/tram interchange with rail in cities is under-researched. Assuming adequate bus/tram networks within cities exist, then bus/tram-rail interchange delivers both direct and indirect benefits. The combination of bus/tram and rail mode can also impact on wider economic and distributional benefits, through making employment opportunities more accessible to lower income groups. This aspect should be given more detailed consideration and emphasised in the appraisal guidance. We suggest that new methodologies might be developed to quantify these important benefits in a consistent way, to enable their inclusion in appraisals.

Discussions within the PDFC have highlighted a concept that demand growth in transport markets within cities may be subject to an evolutionary process with different cities that are at different stages of maturity. Also in recent decades growth in the regions has tended to become polarised around regional hub cities as employment has shifted to service industries. Therefore, it is no-longer sufficient simply to build advice based on the categories of urban or city, but necessary to segment further or determine where urban areas might sit within a range of maturity profiles, relating to the maturity of their markets for travel.

**Some considerations that aim to inform the scope and the priorities follow.**

#### ***National and regional infrastructure***

Strategic infrastructure priorities at a National and Regional level would benefit from joint evaluation to avoid conflicting priorities and help decision making. Schemes with inter-boundary and therefore inter-regional benefits may tend to get a lower profile than those delivering benefits that are self-contained within the region, for political reasons. This issue could be taken into account when deciding on the scope and the priorities.

#### ***HS2 and the West Coast Route***

The influence of HS2 and the transitional impact on the West Coast Route, in all phases, should be an obvious consideration that informs and frames the scope and priorities of the strategy. This includes developing second best options to cover scenarios where the later phases of the high-speed route are delayed, reconsidered or, potentially, even cancelled.

#### ***Wider network effects of incremental improvements***

With respect to rail infrastructure, there may be a reflexive demand relationship between new- and enhanced-infrastructure provision. New infrastructure may stimulate demand in existing, or recently enhanced, parts of the rail network, or vice versa, thus generating additional direct benefits as a result of both schemes being implemented. The identification of these effects requires causal analysis using a more sophisticated network modelling approach, with a broad (but at the same time still detailed), geographical scope. An ambitious “whole system model” would be the ideal option to achieve this but a “second best” solution would be a willingness to broaden out the scope of the modelling demand analysis, to capture demand benefits on a network basis within appraisal studies.

***Including indirect benefits, Wider Economic Benefits (WEB) and regeneration benefits in appraisals***

This is discussed under question five, below.

## **2. People and Place: capturing the range of impacts relevant to transport policy today**

Four suggested priorities are given below.

- i. Transport schemes and improvements that help to re-balance the level of economic activity between regions should be an obvious priority. Transport appraisals need to be guided by an over-riding balanced strategy to take account of this. The Department's "Rebalancing Toolkit" is a helpful contribution, as it aims to reflect, within the development of business cases, the ambition to drive economic growth nationally on a more poly-centric basis than presently.
- ii. A multi-criteria framework for measuring non-monetised impacts of schemes could be developed. A recent attempt at creating a framework for measuring the social value of investment has been made within the rail industry. RSSB has developed a Social impact framework that pulls together a library of measures for rail. This Framework captures potential measures for benefits and dis-benefits across 10 areas. The Department may benefit from reviewing this study.
- iii. Capturing increases in land use value. The transformational nature of some transport schemes has the potential to increase land use value greatly. This should be reflected in the appraisal process. Further work may be needed to understand the likely uplift in land use value from rail investments and how to disentangle this from other sources and chains of causation. Other countries appear to have tackled this issue, so there is perhaps the potential to review their methods, together with the wider processes that they are a part of.

There is no option to give a fourth priority here but RDG notes that the submission by the RSSB in response to this consultation has environmental impact as one of their priorities here. People & Place in appraisal should give due emphasis (perhaps by definition) to the environmental impact of schemes. In particular the impact of transport schemes on: Carbon emissions; air quality; noise- and light-pollution; severance; loss of public amenity and green space.

## **3. Reflecting uncertainty over the future of travel**

Three priorities are given below.

- i. **The general state of the economy and the UK regional balance of economic activity.** Transport demand derives from this ultimately. If the uncertainty in the economy is not modelled well, this will then feed through to inaccurate demand forecasts in the appraisal. Surprisingly, the most obvious and immediate cause of uncertainty, BREXIT, receives no direct mention. BREXIT will potentially have major impacts. Not only overall levels of economic, population and employment growth but also how that growth will impact geographically and by employment sector.

- ii. **The potential for modal switch.** How will the demand for transport in the future allocate itself across modes? Will improvements to fares and rail services encourage loyalty to the rail mode or switching to it from the car mode? Will the advent of Automatic Vehicles (AVs) act to encourage use of the rail mode (e.g. as a feeder mode) or the opposite?
- iii. **As the UK population grows, the towns, cities, urban conurbations and countryside will become more developed.** Car use will increase with it and given a relatively finite road network, there will be a definite increase in congestion. What will the “knock-on” effects be on (a) the use of other modes; (b) flexible working; and (c) the location of worker residence relative to workplace location; and (d) the distributive impacts?

A more sophisticated treatment may perhaps take more account of international studies of economies that have reached the same, or a similar stage of economic maturity to that of the UK. What trends are starting to emerge in other economies and how likely are the same trends likely to manifest in the UK economy in the future?

The future state of transport appears to be studied far more than the current, or future, state of the economy. This is probably not the right investigative order but it is probably a function of the data availability in each respective field.

We are also at a particular point where the range of potential outcomes is particularly diverse e.g. the impact of AVs in terms of when, how and to what scale they will impact is virtually a blank canvas as an end state. With reference to AVs, the unanticipated consequences in the transition period are also very difficult to predict with any degree of certainty.

## 4. Modelling and appraising transformational investments and housing

Four priorities for improvement are given below.

- i. **Knowing when a scheme should or should not be classified as “transformational”.** There will be a tendency for project sponsors to compete to get their scheme classified as “transformational”, especially if they believe it will increase the chance of it being paid for out of public funds (in full, or in part). The categorisation of a project as such therefore needs to be done using clear and unambiguous criteria.
- ii. **Post assessment of schemes is needed to feed back into the model of what worked.** There should be greater focus within government on post scheme appraisal. It should be a routine part of the project lifecycle with the results used to update appraisal methodology/values. The model needs to be refreshed when a ‘transformational scheme’, e.g Crossrail, has been delivered and can be assessed/appraised. The findings can then be incorporated into the model.
- iii. **The housing market is the main driver of the supply of housing, especially expected house prices.** These prices have tended to be on a highly cyclical but overall positive trend over the last four decades. Price as the primary driver of housing

supply must somehow be separated out from any tendency for the provision of new transport related improvements to encourage the provision of more housing stock than would have otherwise been provided, without the intervention.

Given that the more general condition of the wider economy is also implicated on both transport and housing here, the impact on housing provision on transport schemes is recognised as a difficult area to cater for in forecasting terms. More studies are required, perhaps more using well developed land use and transport interaction models (LUTI models) to try and obtain a better understanding the relative impacts.

- iv. **The source of causation of the increase in land values where the cause in the appraisal is attributed to a transport improvement.** Within the UK planning system, the change of land use (e.g. from industrial to residential development), is seen as the main source of the uplift in value. Transport improvements may also partly contribute to increases in land values but cannot convincingly be said to be the sole cause of an uplift in value, given our understanding of other causal processes at work. Where it is being contended that the cause of the uplift in value can be attributed mostly to the transport scheme then that should be based on evidence which can also be composed of past case studies. The Department has published a document presenting case studies for transformational schemes. These are a useful start but are lacking in sufficient background detail in places, e.g. why some benefits/dis-benefits were included and others were omitted.

The RDG does not carry out any appraisals but its members do contribute to them and are asked to support the work of others. Within PDFH6 there is some consideration of what level of change in generalised journey time should be considered to make a rail improvement fall outside of the top end of what size of incremental change the PDFH can handle. For example, does an improvement of 10 minutes on a 30 minute journey time make it different in some way and therefore worthy of a different treatment (which might be termed “transformational”). This example illustrates that one of the key issues, i.e. how to quantify the point at which a project should be deemed definitely “transformational” and what are the other, non-transport based, criteria that it needs to satisfy for it to be deemed as truly “transformational”.

## **5. Supporting the application of WebTAG and making it more user friendly**

Some perceived barriers to using WebTag are discussed below.

### ***Using WebTag to include indirect benefits, Wider Economic Benefits (WEB) and regeneration benefits in appraisal studies***

There is more agreement and clarity over how the direct benefits of rail schemes are to be measured and estimated, than the indirect ones. For example, estimating wider economic benefits appears to be a complex business, often requiring the expertise of specialist consultants to achieve. Some studies for schemes achieve substantial additional benefits through taking account of the elements of WEB and regeneration benefits. The studies that do not take account of this type of benefit are, therefore, at a relative disadvantage. There may be sensible reasons for not wanting to include these benefits but in some cases a failure



to account for them will be due to resource constraints, as including them adds greatly to study costs. This leads to an inequity where some studies benefit from a higher level of benefit in their BCRs, as a function of the ample resources their sponsors have put into them, as compared to other studies, where the converse is applicable.

The advent of new types of indirect benefits being considered by the Department presently may serve to exacerbate this situation. The extent to which this issue has occurred, or is likely to occur frequently in the future, needs to be explored and discussed. The root cause may be that the guidance itself is overly complicated to be executed in appraisal studies by anyone but seasoned specialists. The solution here is simplification where possible and the provision of training. If the guidance cannot be made less complex to use, then it perhaps needs to be clearer about which type of schemes are likely to be required to account for this type of benefit (i.e. as a requirement opposed to just recommended to so). That would tend to reduce the inequity but only assuming no schemes then fail to be evaluated at all (for any benefits), due to the resource constraints of their potential sponsors/funders.

The advice has become increasingly complex to apply and relies upon data which itself is often of questionable accuracy, leading to the suspicion that the implementation of the advice actually leads to less rather than greater accuracy. Simplification of models, reversion to use of primary data sources and improvements to those primary data sources is what we would propose.

Understanding the flexibility is probably more a function of the understanding of the experience that the user of WebTag has in using modelling and appraisal process, than the guidance itself. A seasoned practitioner will see the flexibility in the guidance, or at least seek to identify and test it. A less seasoned practitioner will be more inclined to see it as more rigid. Sometimes there is no substitute for experience but well thought out training courses might go some way to communicating flexibility that is already inherent in the guidance.

WebTag should feature some flexibility but it should avoid being too liberal in this respect, in the interests of ensuring that a level playing field is maintained.

Those used to technical documents do not struggle with the presentation of WebTag. There are many, however, with a less technical background, who find it more daunting. There are many cross-references, with links leading to other links and it seems (in some parts at least) to the user that there is an enormous amount to read before they will be able to grasp the core of topic under consideration. Without a background in the area it is difficult to see which of the many cross references to prioritise, or alternatively, to ignore (at least temporarily).

The structure of PDFH6 is an example of an approach that is by no means perfect but may in some ways be an improvement on some parts of WebTag. There are two main sections in the PDFH. The first (Section B) gives readers the values and elasticities with examples of how to use them but there is minimal text otherwise, other than that necessary to introduce the content. Section C provides a parallel structure but has more detail, e.g. the mathematical background to the calculations, together with more detailed discussion about the references

and the evidence base. There is a Section B and a Section C for every separate chapter topic, e.g. the impact of demand on fares, or on journey time.

Transport for London's BCDM is another example of a technical document with a structure intended to cater for both seasoned practitioners and more novice users alike.

## 6. Developing modelling and appraisal tools that meet user needs

Three suggested priorities for improving the development of modelling and appraisal tools.

- (i) **A readily available tool to model the impact of rail performance at a network (or meta-network) level.** RailSys is expensive to use in terms of both time and cost. NR's System Operator function is examining modelling as part of its current CP6 activities, under the auspices of the wider System Modelling Programme. The PDFH demonstrates that rail users value reliability improvements greatly. The rail mode features relatively low journey time variability and these benefits are valued greatly by users but not represented in appraisals. They should be included and compared between competing modal options and the benefits/costs thereof included in the appraisal (if not already planning to include).
- (ii) **A fresh look at the modelling of risk and uncertainty is necessary to take account of potentially large changes in future travel behaviour due disruptive technology.** In addition to the envisaged "end-state", after the introduction of new technology, the level of demand for modes in the transition period beforehand, is also important, potentially more disruptive and probably more difficult to predict.
- (iii) **More investment in studying the ex-ante and ex-poste performance of schemes in terms of their demand forecasts and benefits delivery,** e.g. were the forecast numbers of users realised and did the forecast number of jobs, houses, etc. ever get delivered? Working toward a bank of evidence for planners to draw upon when considering the options for new rail infrastructure or enhancements. This bank could include links to the data used in any previous studies.

Demand forecasting is of critical importance to appraisal and so innovations to improve applied demand estimation methods should therefore be a central priority. With regard to rail demand forecasting the Department has invested in some studies which have contributed some small, incremental improvements to methods and results. However, when considered in the context of the huge investments that rail infrastructure and services represent, the investment in improving forecasting model methodologies is very small.

The rail industry has for many years taken the initiative on rail demand forecasting, supporting the development of the tools and methods from within. This independent approach is valued by the industry and there is no appetite for rail demand forecasting to become a Government dominated enterprise. Nevertheless, many of the Department's recent initiatives to improve demand forecasting have not involved strong partnerships, with the industry. Beyond very initial stage workshops only limited involvement from other stakeholders has been solicited by the Department. This approach has not led to a more generally perceived set of improved

outcomes. At the same time it is the intention of the industry to take the initiative here and invest more heavily in improving demand forecasting models. Arriving at more accurate demand forecasts and estimates for rail is in the interest of all stakeholders in the industry and closer partnership working, alongside greater investment in the development of applied methods, in partnership with industry, should be a stated priority. Failure to cooperate with the industry and duplication of effort will potentially undermine efforts to develop research centrally through RDG and lead owning groups and TOC's to question the value of funding and remove industry expertise and experience from the process.

***Suggested new and emerging techniques and methods to be explored.***

If there is an ambition to link transport improvements to new developments in appraisals, then a fresh look at Land Use and Transport Interaction (LUTI) models should be made. With the recent advances in data processing and management, they may be less expensive to construct than they once were and may have the potential to deliver more than previously, should an investment be made in them now.

The reference to 'big data' is encouraging, at present this has great potential but is often prohibitively expensive and not readily available for application. However, many of the survey based sources of economic data e.g. employment figures by region and by urban centre are of questionable quality. Use of these data sources to enhance the quality of these datasets would be a major step forwards.

---

<sup>i</sup> [https://www.motability.org.uk/Factsheet\\_3\\_-\\_How\\_the\\_Motability\\_Scheme\\_is\\_funded.pdf](https://www.motability.org.uk/Factsheet_3_-_How_the_Motability_Scheme_is_funded.pdf)

# Consultation:

## Transport appraisal and modelling strategy: informing future investment decisions

## Response from RSSB

15 October 2018

### Introduction

RSSB provides research, analysis, and insight to help the industry work together to deliver a better, safer railway. We welcome the opportunity to respond to this consultation.

### Responses

#### 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?

In answer to both questions, RSSB welcomes these proposed themes for improvement to the appraisal process. RSSB suggests that in order to keep WEBtag relevant and addressing the priorities, it should be required to assess the project against the current government strategies and wider policy context, for example the 25 Year Environment Plan.

Topics that appear to be omitted include: whether the project is future-proofed to predicted climate and social trends, including but not restricted to climate change; including infrastructure resilience to more extreme and frequent disruptive weather events; and the aging population/planning for a railway that must be more accessible and inclusive to a wider range of passengers.

There would also be merit in taking into fuller consideration what the future holds. Estimates about future transport use usually rely on limited back-casting techniques based on small samples. There could be a bigger role for big data to understand what really lies at the heart of people's needs and decision-making which will affect the nature and frequency of the journeys they need to make in the future.

## 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.

RSSB welcomes incorporating social, human and natural capital/ecosystem services assessment into the appraisal process as a more sophisticated approach, as this is in line with the 25 Year Environment Plan. RSSB supports further work to understand and measure the potential value rail brings to society and build in requirements into opportunities for investment in social and natural capital into transport projects.

## 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.

RSSB would welcome further research and consideration of social/human and natural capital, and in particular, noise and air quality impacts on health.

- 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 would highlight that RSSB is currently undertaking research on the future modal choices which could impact the future investment strategy for transport (reference T1134). RSSB anticipates significant changes in transport demands in the next 25 to 50 years. WEBtag could be used to appraise how well a project fits with future anticipated transport needs and integrating into new technologies such as autonomous vehicles and infrastructure such as electric car charging at stations.

## 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.

RSSB welcomes improvements in understanding transformational investments. In particular we welcome better understanding value for money and where it can have the most beneficial impact for the communities it serves and wider society, promoting more sustainable ways of living.

RSSB supports the strategic spatial planning of natural capital investment in parallel with the grey infrastructure to retain and improve the high quality and resilient environment particularly where there is intensive development from multiple sectors. Valuation of natural capital investment at the strategic level should be an area of priority for improvement in line with the 25 Year Environment Plan. Requirements for natural capital investment and planning should be assessed in feasibility and business case stage through the WEBtag and incorporated into project level remits.

- 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?

Modal shift and Social impacts - see Q11 and Q13. Modal shift should also consider the potential for integration with other forms of sustainable travel and MaaS (Mobility as a Service), for example infrastructure at stations such as public transport interchange and electric car charging point, feeding into project remit.

## 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?

Work using WebTAG at the early stages of a project are not brought through to the requirements or remit of the project. Guidelines and process should demand the WebTAG outcome to be translated to action or requirements and flow to the following stages of project management.

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

We have nothing to contribute to this particular question.

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 have nothing to contribute to this particular question.

## 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.

1. Modal Shift is a key objective of rail investment, supporting sustainable development for the UK. It is known to support improvements to air quality, reducing environmental noise, reduce road congestion and contribute to the reduction of greenhouse gas emissions. However current processes do not provide sufficient modelling of the modal shift predictions to assess and quantify the predicted extent and therefore benefits/impact of modal shift at a project/local level.
2. Priority should be given to whole-life carbon calculation for a project, including where applicable, modal shift, operational energy use, embodied carbon and construction. This should be the baseline so that a project can set targets to reduce the whole life carbon footprint. The RSSB Rail Carbon Tool could be applied at Business case stage for rail projects.

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

The appraisal process can identify impacts of a scheme, but also it can capture the potential opportunities and value in innovation or better outcomes. The appraisal process could better support innovation and better outcomes through direct links to requirements/remit setting for transport schemes. WebTAG has the opportunity to capture whole-life benefits/costs to drive innovation, which is often prevented on projects due to the benefit being realised in an operational phase or future project while capital costs lie with project design and construction stage (therefore difficult to make the business case at a short term project level for investment or taking risk in innovation).

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

RSSB has developed a Social Impact Framework that pulls together a library of measures for rail. This Framework captures potential measures for benefits and dis-benefits across 10 topics:

- Local and sustainable procurement
- Employment and skills
- Employee engagement
- Diversity and inclusion
- Community safety
- Customer satisfaction
- Accessibility
- Health and wellbeing
- Social inclusion
- Regeneration

This framework could be used to better assess the full array of community and socio-economic impacts already highlighted by the WebTAG process and provide a robust consideration of benefits as well as disbenefits. More information on this research can be found here: <https://protect-eu.mimecast.com/s/gPpPC1jAkfrnQqH1R-fE>

Also we note the work carried out by Defra to measure Biodiversity units and the natural capital Biodiversity provides that should be employed to better measure Biodiversity value.

## About RSSB

RSSB provides research, analysis, and insight to help the industry work together to deliver a better, safer railway.

As a membership-based rail industry body, RSSB includes train and freight operating companies, infrastructure managers, contractors, rolling stock leasing companies and suppliers, and our work involves partnerships with academia and other railways across the world.

If you need to contact RSSB about our response to this consultation, please contact Matt Clements, email [matt.clements@rssb.co.uk](mailto:matt.clements@rssb.co.uk), telephone 020 3142 5332.

[www.rssb.co.uk](http://www.rssb.co.uk)