



Department  
for Transport

# Appraisal and Modelling Strategy

## Theme workshops and TAG User Survey Results

**Moving Britain Ahead**

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# Introduction

## Background

- 1 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. The strategy<sup>2</sup>, which is published alongside this document, aims to enable the best investment decisions to be made by equipping those producing appraisals with the right tools, methods, knowledge and data to produce robust assessments of the wide-ranging impacts transport investment has. It also aims to ensure that these impacts are presented clearly and imaginatively to decision makers painting an informative and insightful picture of the impacts.

## Theme workshops

- 2 As part of the consultation, we embarked on an active round of engagement to gain a better understanding of our stakeholders' evidence needs and the challenges faced when applying Transport Analysis Guidance (TAG)<sup>3</sup>. We held ten consultation events: a launch event; four regional events in Birmingham, Exeter, Leeds and London; workshops on priorities for each consultation theme and an online TAG user survey. In total we met over 200 people, received 74 responses to the consultation and a further 90 responses to an online TAG user survey.
- 3 This document presents summaries of discussions at the five theme-based workshops and the results of the online TAG user survey. To encourage a wide range of views and open discussion, the workshops were led by leading experts in the field and included a diverse mix of stakeholders. The workshops played an influential role in determining the priorities for each theme that are detailed in the strategy document. **In the interests of transparency and openness, the summaries have been written by either the workshop lead or an external attendee. They do not, therefore, necessarily reflect the views of DfT.**
- 4 We are grateful to the following people for their contributions:
  - Peter Jones, Professor of Transport and Sustainable Development, University College London (UCL) for chairing the "People and Place" workshop and to Paulo Ancaes, Research Fellow at UCL Centre for Transport Studies, for summarising the discussion;
  - Richard Batley, Professor of Transport Demand and Valuation and Director of Institute for Transport Studies (ITS) University of Leeds, for organising and summarising the workshop on "Reflecting uncertainty over the future of travel";

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

<sup>2</sup> [link to STRATEGY]

<sup>3</sup> We are taking the opportunity of a new strategy to drop the increasingly outdated "Web" element of WebTAG.

- Tony Venables, Professor of Economics, Oxford University, for organising and summarising the workshop on "Modelling and appraising transformational investments and housing".
- David Christie, Demand Forecasting Manager, City Planning, Transport for London for chairing the workshop on "Supporting the application of WebTAG and making it more user friendly" and Tim Gent, Technical Director, Atkins, for summarising the discussion.
- Tom van Vuren, visiting professor ITS Leeds and Mott MacDonald, for organising, hosting and summarising the workshop discussion on "Modelling and appraisal tools that meet user needs".

# 1. People and Place: capturing the range of impacts relevant for transport policy

## Introduction

- 1.1 This chapter reports on the workshop on the "People and place: capturing the range of impacts relevant for transport policy" theme.
- 1.2 The objective of the workshop was to gather views on priorities for expanding the WebTAG guidance regarding three sub-themes:
  - Healthy people and places;
  - Journey improvements;
  - Location attractiveness.
- 1.3 The workshop was held in London on 27 September 2018 and was chaired by Professor Peter Jones of UCL (University College London). Participants represented a range of stakeholder organisations with particular interest and/or expertise in the theme of people and places in the context of transport appraisal, including universities, consultants and local and national governmental institutions.
- 1.4 The attendees were as follows: Iven Stead (DfT), John Nellthorp (ITS Leeds), Gerard de Jong (ITS Leeds), James Laird (Peak Economics), Tom Worsley (ITS Leeds), John Swanson (SDG), Terry O'Neill (Temple Group), Colin Smith (Defra), Ryan Taylor (TfL), Tom Millard (PJA), Like Jiang (ITS Leeds), Andrea Barry (TfN), Bruce McVean (City of London), Lucy Saunders (TfL), Paulo Anciaes (UCL), Andy Cope (Sustrans), Bianca Letti (NIC), Matthew Dillon (ARUP), Manuel Ojeda Cabral (ITS Leeds), Bridget Fox (CBT), David Metz (UCL), Paul Cobain (TfWM), Pedro Abrantes (HE), Rhys Wheeler (HE), David Simmonds (DSC), Henry Kelly (DfT), Jack Snape (TfN), and Ian Raymond (Merseytravel).
- 1.5 The summary of the discussion below has been written by Paulo Anciaes (UCL) and does not necessarily reflect the views of DfT.

## Format of the workshop

- 1.6 The workshop started with three motivation presentations, from John Nellthorp, Gerard de Jong, and James Laird, introducing the sub-themes of healthy people and places, journey improvements, and location attractiveness, respectively. The presentations described the scope of these sub-themes (i.e. what are the relevant transport impacts and whether they are already covered in WebTAG) and the state of research on methods to assess them.
- 1.7 The chair (Peter Jones) then asked the practitioners in the room about their opinion on the methods for transport appraisal in use in their organisations, and if they

adequately cover impacts on people and places. The objective was to gather views on the state of practice in this field.

- 1.8 The workshop was then split into three breakout groups to discuss the three sub-themes separately. The group discussions were facilitated by Peter Jones (healthy people and places), Tom Worsley (journey improvements), and John Swanson (location attractiveness). Each group discussed the following two questions:
- **Priorities** – which transport impacts should be added to appraisal guidance and which impacts already covered in guidance require better methods of modelling and appraisal?
  - **Practicalities** - what are the major problems in improving the guidance on those impacts?
- 1.9 This note summarises the main points made by the workshop participants and the areas of agreement and disagreement on the four aspects described above, i.e. state of research, state of practice, priorities for the future and practicalities.

## Healthy people and places

### State of research

- 1.10 The motivation presentation on 'healthy people and places' impacts stressed that most of these impacts are related to pedestrian movement and can be split into two main groups:
- Negative impacts caused by motorised traffic (e.g. exposure to noise and air pollution, accidents, and delays)
  - Positive or negative impacts caused by urban design (e.g. ease of movement along and across the street, navigability, street environment, and availability of places to stop).
- 1.11 The speaker also presented recent developments in methods to estimate the economic value of interventions such as the reduction in community severance caused by busy roads and improvements in the urban realm.
- 1.12 Areas where knowledge is still insufficient include:
- Exposure to noise for individuals in their workplaces or using the streets;
  - Morbidity aspects of inactive travel;
  - Users' satisfaction with street quality;
  - Stress caused by accident risk (which is an impact different from accidents per se).
- 1.13 Given the interrelationship between several "people and places" aspects, the speaker believed that WebTAG could adopt a more holistic "public health perspective", covering impacts such as noise, air pollution and active modes.
- 1.14 The speaker also identified both a gap in the evidence base and a lack of practical tools for forecasting demand for active modes to support economic valuation. The 'propensity to cycle' toolkit has been very successful, so a similar tool could be created to estimate propensity to walk.
- 1.15 The speaker talked in some detail about the strengths and limitations of commonly used methods such as stated preference methods and hedonic pricing and suggested that given the nature of some of the impacts on healthy people and



places, approaches based on concepts such as life satisfaction and subjective wellbeing could be a viable alternative to cover the shortcomings of existing methods.

### **State of practice**

- 1.16 Among the practitioners in the room, there was a consensus that health impacts are already reasonably well captured but there was interest in their organisations for widening the scope of the impacts included in appraisal, with participants suggesting aspects such as morbidity, long-term effects, mental health, and benefits of using green space.
- 1.17 Practitioners generally supported the idea that transport appraisal should go beyond aspects of movement (of people and goods), and consider also the impacts of transport schemes on public places (including streets and areas surrounding stations). It was felt that despite some recent developments, the values of good-quality places and of improvements in the urban realm are still not well captured in transport appraisal.
- 1.18 Several participants mentioned biases in current practice, such as:
- Estimating benefits of active travel but not the costs of inactive travel;
  - Deriving values based on what individuals want (usually expressed through stated preference surveys), rather than on what individuals and society need;
  - Methods tailored to the assessment of large projects, and not always applicable to smaller interventions;
  - Detailed guidance for assessing health impacts in urban areas but relatively little information for the case of non-urban areas.

### **Priorities**

- 1.19 The group discussions on the 'healthy people and places' sub-theme identified two main gaps in existing methods:
- Some impacts already have a solid framework of analysis and a considerable evidence base, but the framework needs to be expanded and the evidence base needs to be fully exploited in order to be applicable in practice.
  - There are impacts that call for more than a simple change in perspective, and require whole new concepts and appraisal methods, because there is no consensual definition of what the impacts are, and poor knowledge about how to quantify and value them (and whether this is possible or desirable).
- 1.20 One example of impacts that already have a solid conceptual and empirical base which nevertheless requires further development is transport-related noise. The standard approach is the measurement of the negative impacts of noise on health. But several participants felt that this is not the only relevant impact of noise. Participants mentioned several additional impacts that could be considered, and for which there is almost no evidence, such as how transport prevents people from enjoying the positive elements of "soundscapes", including the sounds of nature, children playing, or neighbours chatting.
- 1.21 In addition, appraisals tend to consider only the impacts on residents in areas surrounding noisy transport infrastructure, neglecting the impacts on other people using the area (e.g. workers, tourists), and focus on impacts of people at home, not walking or using public spaces. There is also a need to look beyond noise levels, and consider perceptions about those levels.

- 1.22 Another area with a solid conceptual and empirical base which could nevertheless benefit from further development is the assessment of impacts on physical activity, which was felt by some participants to suffer from a similarly partial point of view as the assessment of noise. Current appraisal methods are designed to capture the active travel benefits of interventions that improve conditions for non-motorised modes (e.g. walking, cycling), and not the costs of reduced physical activity caused by interventions that improve the circulation of motor vehicles in detriment of non-motorised modes. It was felt that more research is needed on how transport schemes affect the use of different modes of transport, and the consequences on the individuals' physical activity levels. Participants also mentioned that there is some academic literature on the associations between physical activity and subjective wellbeing, but few practical methods to address these associations in the context of appraisals of specific transport interventions.
- 1.23 One area that requires whole new concepts and methods is the assessment of the value of "place". It was felt that WebTAG and other transport appraisal frameworks rely on a concept of transport as movement and are not well suited to assess the uses of transport infrastructure (e.g. streets, stations) as places where people spend time. So, there is a need to have a better understanding on the impact of transport schemes on public places and then on how people perceive those places and how that affects their wellbeing.
- 1.24 A related aspect is how the quality of places, as perceived by their users, is affected by what one participant called "traffic dominance", meaning the psychological and social impact of the presence of motorised vehicles in streets and other public places, over and above the problems caused by collision risk, noise, air pollution, and community severance. The participant mentioned that the type of vehicles that may use the roads in the future ('smart' and environmentally efficient) may solve all these problems, but they will still have an impact on people using the surrounding spaces just by being "metal structures moving around" on the streets.
- 1.25 It was also noted that increasing the focus of transport appraisal on people, either by expanding existing knowledge or creating new concepts and methods implies giving more attention to equity issues. It was felt that current appraisal frameworks are designed to give priority to either the groups that benefit or the groups that are negatively affected by a given intervention. A more balanced perspective is needed.

### **Practicalities**

- 1.26 One of the implications of extending or reformulating WebTAG to address the aspects identified in the previous discussion is the need for more complex modelling than is routinely undertaken now.
- 1.27 For example, one participant mentioned that the assessment of how people are exposed to noise in different modes of transport at different times of day requires a rigorous assessment of the mobility patterns of the population. Similarly, another participant noted that to derive a more comprehensive assessment of the impact of transport schemes on physical activity, enhanced methods are needed to forecast the individuals' levels of physical activity during a period (e.g. a whole day or week), rather than on a trip basis, considering the modes of transport used during that period.
- 1.28 The assessment of the value of good-quality places is also dependent on the development of more sophisticated methods to estimate and forecast how many people use a place and the impact on their quality of life.

- 1.29 The point made by the speaker in the motivation presentation was further developed in the group discussion. It was generally agreed that the assessment of the more subjective aspects of health and wellbeing requires methods that go beyond stated or revealed preferences.
- 1.30 There was also some discussion on the practicalities of attending to equity issues in the appraisal of healthy people and places. A theme that emerged was the need to give more attention to spatial aspects. Participants mentioned aspects such as:
- A better delimitation of the area affected by the interventions;
  - Network effects of interventions in one area on surrounding areas;
  - Imbalances between geographic areas having the positive and negative impacts.
- 1.31 According to one participant, improving methods to assess equity within appraisal is important but is not enough: equity considerations need to be brought forward in the planning process, at the strategic level, and as an element informing option generation.
- 1.32 There was also a consensus that the development and application of new or improved methods that are more complex and have a wider scope than the ones currently in use would be more successful if it was the result of inter-department and interdisciplinary efforts. For example, one participant noted that approaches used by Defra to assess the benefits of green space are highly relevant for the study of the benefits of public spaces in cities.

## **Journey improvements**

### **State of research**

- 1.33 The motivation presentation on journey improvements stressed that the value of travel time is very important for appraisal - more than for modelling and forecasting. However, there is an increased recognition that travel time has both a negative and a positive component. The positive component has become relevant due to the growing number of IT-driven opportunities for productive uses of travel time. The speaker thought that this moves the policy debate from reducing travel time to travel time efficiency (which can be increased, for example, by investments in Wi-Fi on trains).
- 1.34 The speaker also discussed the suitability of the methods currently in use to estimate the value of travel time. It was noted that the values that are obtained by stated preference methods are probably the difference between the values of the positive and negative components of travel time. However, there is still insufficient knowledge on how to disentangle those two components. The speaker suggested one solution could be to include the positive component of travel time as a separate element in cost-benefit analysis, requiring bespoke surveys to estimate its value.
- 1.35 Considering the value of both positive and negative components of travel time also creates a dilemma, as the higher potential for using travel time in public transport trips could be seen as implying a lower priority to investments that improve travel speeds of public transport, compared with those that improve speeds of private vehicles.
- 1.36 The chair of the workshop agreed that these are pertinent questions and that it is important for appraisal guidance to be clear that what is usually called “value of time” is in fact the “value of travel time savings”.

- 1.37 The speaker also mentioned methods to value improvements in freight transport and stated that the current cost-saving approaches are appropriate. However, more stated preference evidence is needed to value the reliability of freight transport.

### **State of practice**

- 1.38 The general opinion among practitioners was that advances have been made in the assessment of journey improvements, although there was some disagreement on whether current methods are already good enough. For example, several participants mentioned that their organisations already include journey quality in appraisal, most commonly by using multipliers of travel time to account for crowding in public transport. However, one participant thought that these multipliers could be refined.
- 1.39 Reliability is also in some cases already accounted for in transport appraisal. For example, two participants mentioned that their organisations have simple lookup tools to value disruption. But there was some disagreement regarding the potential for using sophisticated models to capture reliability. One participant mentioned that reliability could be captured by modelling the probability of having ‘bad days’ (i.e. delays, overcrowding, or mass trip cancellations). In contrast, another participant noted that models tend to perform poorly in forecasting extreme peaks and troughs in transport demand.
- 1.40 A common theme in the discussion was that a broader perspective of reliability is needed, encompassing the resilience of the transport system in face of unexpected events affecting travel demand or supply.

### **Priorities**

- 1.41 Participants agreed that, despite the developments in the opportunities for productive or enjoyable uses of travel time, travel time savings are still an important impact of transport interventions, and should be an object of appraisal. The main question is whether it is more desirable to save travel time in “bad” (i.e. economically, socially, or environmentally unsustainable) transport modes or to improve the conditions under which people travel in “good” transport modes.
- 1.42 There was general support for the idea that journey improvement is more than simply shorter or longer travel times. Some suggested that travel time reliability is as important as travel time itself. One participant mentioned the importance for passengers of having a “consistent experience” of travel time. Most participants agreed that there is still a limited understanding of the causes and effects of travel time reliability and how policy interventions can improve it, especially in the case of road transport.
- 1.43 Most participants supported the view that the values of time used in appraisal should be modified based on aspects of journey quality such as comfort and convenience. However, it was felt that the evidence base on these aspects is still relatively small. For example, more research is needed on crowding in public transport, something that is not easily captured in travel demand models. One participant mentioned that bus crowding is a particular evidence gap.
- 1.44 There are also many gaps on the wider impacts of improvements (or deteriorations) in journey quality. One example is safety, which is currently appraised in terms of the personal and property costs of accidents. Several participants thought that the long-term effects of stress and trauma caused by accidents are not well captured. One participant mentioned that WebTAG already recommends values for trauma of experiencing a rail accident (taken from Rail Safety and Standards Board guidance) and another that WebTAG recommends values for human costs, described in the

guidance documents as “pain, grief, and suffering” – although both participants agreed that more research is needed to derive more robust valuations.

- 1.45 It is also important to look at the social and behavioural aspects of accidents involving pedestrians and cyclists. For example, accidents may have an impact on travel demand. One participant pointed out that witnessing or learning about accidents involving cyclists may lead some people to make fewer trips by bicycle. However, there is little empirical evidence on these aspects, and no established methods to account for them in appraisal.
- 1.46 There was also a consensus that freight transport is a relatively neglected topic in transport appraisal. Some participants stressed that given rapid changes in patterns of production and consumption, transport planners need to understand how freight transport uses the road infrastructure and how new infrastructure, improvements in the management and operation of that infrastructure, and regulations, benefit not only the freight industry but also the whole community, through the impacts on producers and consumers. It was also mentioned that reliability is key for freight operators.

### **Practicalities**

- 1.47 In the discussion on the practicalities of improving the appraisal of journey improvements there was some consensus around the idea that the main issues related to the application of values of travel time are not methodological but empirical and presentational. Empirical because values derived in a particular geographic area at a particular time do not always transfer well to other contexts. Presentational because it was felt that WebTAG does not explain clearly what “value of travel time” means and what it measures.
- 1.48 Potential methodological issues were acknowledged, including:
- Accurately forecasting uses of travel time. This issue could be solved by building an evidence base on how people use travel time in different modes under different conditions;
  - Isolate the opportunity cost of travel time from the value of productive/enjoyable travel time uses;
  - Double counting journey quality benefits as other types of benefits (for example, safety, personal security, or reduction of noise).
- 1.49 Participants also commented on the use of multipliers of travel time to represent different aspects of journey quality in different modes of passenger transport:
- There was some support for updating the multipliers recommended by the Passenger Demand Forecasting Handbook for the value of travel time spent in crowded conditions for rail trips.
  - There was also some discussion on the scope for deriving multipliers for car trips by modelling the value of driving in roads with different levels of congestion – and if the necessary research effort is justifiable.
  - It was also noted that there are currently no recommended multipliers for bus trips.
- 1.50 It was generally recognised that improving the appraisal of journey improvements requires more complex modelling and appraisal methods, especially to capture the wider impacts of those improvements – some of them may occur only in the medium or long term.

- 1.51 Freight transport is a particularly complex area. It was recommended that appraisals should consider not only the preferences of freight operators but also the impacts on the sender and recipient, other road users, and other stakeholders. One participant mentioned that it is also important to consider how other policies, such as clean air zones, impact on freight transport, and suggested that in some cases, policies that directly or indirectly restrict freight transport may be beneficial for society.
- 1.52 In practice, the development and application of more sophisticated methods for appraising freight transport is challenging. One participant identified three major hurdles to overcome: data collection, forecasting, and economic valuation. Another participant suggested that, due to the complexity of the topic, the production of appraisal guidance on the quality of freight transport requires very specialist expertise.
- 1.53 There was also some support for an increase in the scope of the aspects covered in the appraisal of passenger transport. For example, it was suggested that the impacts of improvements in travel time and journey quality could be assessed not only for current users but also for non-users.
- 1.54 It was also mentioned that there is a wide potential for different types of journey improvements in the future, due to advances in travel modes and information technologies. The assessment of these improvements would therefore benefit from better methods for generating the options that are included in the appraisal.

### **Location attractiveness**

#### **State of research**

- 1.55 The motivation presentation on the 'location attractiveness' sub-theme explained that transport has potential impacts on the character of the locations it serves. This is because the changes in the transport options available in one location, and the associated changes in the total number of trips starting or ending in that location, often lead to changes in land use and in the attractiveness of the location for people and businesses, materialised in the number and diversity of the opportunities, facilities, goods, and services available in that location.
- 1.56 The speaker mentioned some examples of the use of linked transport-land use models and methods to capture the benefits from increased attractiveness of trip destinations. However, it was felt that this area is still fairly thinly researched and has been dormant for some time – it is much less established than the “healthy people and places” and the “journey improvement” areas.
- 1.57 The speaker also thought that the ‘rule of a half’ as an approximation of the value of new trips does not capture the positive and negative spill-overs of transport investment in the origins and destinations of those trips.
- 1.58 One workshop participant remarked that there is now very clear evidence that investments in transport tend to ‘buy’ accessibility, not travel time savings, as individuals use improved transport to travel to further places. This means that land use is a key component in the appraisal of transport schemes.

#### **State of practice**

- 1.59 The opinion of practitioners was that WebTAG is not up-to-date regarding the measurement of the benefits associated with trip generation and suppression, as guidance does not consider current trends towards different commuting, shopping, and leisure patterns (for example, flexible working and work/shopping from home). In



some cases, suppressing a trip generates a benefit – something that current guidance does not acknowledge.

- 1.60 It was commented that the lack of solid WebTAG guidance on the impacts of transport on land use results in reluctance to consider these impacts. However, some participants mentioned examples of the use of transport-land use models in their organisations. Nevertheless, it was felt that the current practice of trialling different approaches in parallel in different organisations is inefficient, so a convergence in methods would be welcome.
- 1.61 The general opinion was that it is important to capture the value of transport on land use, and that means widening the scope of current approaches, as these approaches have the following biases identified by participants:
- They consider the impact of transport on land use but seldom the feedback effects of land use on transport (for example, how land use changes affect transport revenues).
  - They are more suitable to assess residential location than business location.
- 1.62 Some participants felt there was some confusion about the indicators of the benefits of increased location attractiveness, as some government departments use land value uplifts and others use logsums (which are based on demand models).

### **Priorities**

- 1.63 In the group discussion on priorities regarding the location attractiveness sub-theme there was widespread consensus that the rule of a half is a poor measure of the value of new trips.
- 1.64 It was also felt that there is a lack of solid evidence on the multiple interactions between the transport system and patterns of land use and incomplete guidance on how to assess these interactions - transport and land use are mostly treated separately in WebTAG. There is a need for more suitable approaches to integrate transport and land use and appraise packages of changes involving both.
- 1.65 Participants also alerted for the fact that it is not enough to capture the benefits for locations. It is also necessary to show that projects have an impact on people living or using those locations, such as for example:
- Local economic growth and what one participant called “thriving communities”.
  - Social aspects such as reduction of structural unemployment. It was felt that these impacts could be better estimated. One participant mentioned that the valuations used by the Department for Work and Pensions could be applied in this context.
- 1.66 Several relevant distributional aspects were also mentioned:
- Appraisal is usually limited to the assessment of how projects generate benefits at trip destinations. However, the same projects may lead to costs at trip origins. This is for example the case when improved transport leads people to stop doing an activity (e.g. shopping) in their local area and start doing it in another area.
  - The additional economic activity generated by transport in one area may be displaced from another area. However, it was noted that it is not necessarily a zero-sum game
  - Projects that disproportionately increase jobs in deprived areas may be more desirable than projects with a more equal distribution of generated jobs.

- 1.67 More generally, attending to the relationships between transport and land use requires judging the extent to which the anticipated impacts of projects are aligned both with their economic and strategic cases. Participants agreed that economic case narratives (which tend to focus on journey time savings) can differ from strategic case narratives (which discuss changes in jobs and housing). It was mentioned that disconnecting the strategic and economic cases contributes to a perception of “rigidity” in WebTAG. Some participants thought that WebTAG could be slightly modified to address this, but others thought that a wholly different approach is needed to appraise major transformational schemes. This approach could focus on benefits from land use changes, rather than on travel time savings.

### **Practicalities**

- 1.68 In the discussion about practicalities, there was a lack of consensus about the most suitable indicator to measure location attractiveness. Some participants noted that trip generation and attraction, or house price value changes, can be proxies for location attractiveness. Others suggested that it is also necessary to consider how people perceive the increased attractiveness (for example, in terms of accessibility and quality of housing and local environment).
- 1.69 There was also a discussion about the risk of double counting (for example, the benefits of location attractiveness and economic agglomeration). It was suggested that the scope of analysis and the risk of double counting could be clarified in advance, in guidance documents.
- 1.70 There was a general recognition that measuring the impact of transport on land use changes is very complex, as it requires capturing multiple cause-effect relationships at different time scales and isolating the effect of transport schemes from other factors affecting land use.
- 1.71 It was also pointed out that transport interventions can lead to a relatively quick change in transport modes used by individuals, but not to changes in decisions to change residence and job location. It may take up to 20 years for the full impacts of transport on land use to appear.
- 1.72 This time-lag effect is a problem, as there is a lack of data to show transformational and behavioural impacts resulting from transport schemes over time. Some of this data would need to be gathered before suggesting any major changes to WebTAG.
- 1.73 A related issue is the commercial sensitivity surrounding data. A good proportion of relevant data is generated by private companies, especially land developers. The information in the Passenger Demand Forecasting Handbook is also protected. Some participants believed that opening up data and commercial models could produce better outcomes for all. There was also a suggestion for DfT to adopt a data access model akin to the one of Ordnance Survey, where data is accessible, with conditions.
- 1.74 There was also disagreement on whether the additional benefits captured are big enough (or the current evidence base small enough) to justify the extra effort put in developing (and then applying) new methods to capture those benefits. Some participants felt that the existing methods are sufficient to derive a broad estimate of the impacts of transport and land use. Others felt that better methods are needed, because the potential benefits of changes in land use are substantial, as transport can have a large impact on where people live and work.
- 1.75 Participants also mentioned several possible solutions to reduce the effort in assessing the relationships between transport and land use:



- Use simple models, at least at the stage of drafting the strategic case for schemes.
  - Re-use existing models, because a large part of the country has already been modelled.
  - Use versatile models, which can have scheme-specific components within an underlying unified base.
  - Use new data sources, which allow for faster and cheaper modelling.
  - Use results of evaluation studies – however, it was noted that models are still needed to assess counterfactuals (i.e. the “do nothing” alternative).
- 1.76 There was also support for cross-department cooperation and joined-up efforts across sectors, for example, with the housing, environment, and labour market sectors. It was suggested that the work done in the field of spatial economics (for example, spatial models that take into account transport costs) could provide interesting insights on methods for appraising transformational schemes, but there was also scepticism about this among some participants.
- 1.77 One participant mentioned that the problems regarding multiple parallel efforts in different organisations, discussed in a previous section, could be reduced if DfT could specify performance criteria to benchmark models. However, not all participants agreed with this and the idea of the ‘rigidity’ of WebTAG re-emerged. Some participants believed that WebTAG “sets the floor” but also inhibits further development of appraisal and contributes to a compliance culture.
- 1.78 Participants agreed that learning from international experience is also important although there was disagreement on the relative merits of WebTAG when compared with similar guidance in other countries. Differences in decision-making processes also complicate any comparisons. It was also commented that the majority of the literature on transport and land use is US-based. Some participants questioned the suitability of applying this to the UK.

## Overarching issues

- 1.79 Before closing the workshop, the chair made a summary of common issues identified in the separate group discussions. This was followed by a final plenary discussion reflecting on these issues and on the implications of addressing them. This section of the report combines the ideas discussed in this final session with conclusions derived from the sections described above.
- 1.80 An overarching issue across the discussions on the three sub-themes was that current appraisal methods to assess people and places often look only at “one side of the coin”: either the positive or the negative impacts of transport schemes. For example, appraisal tends to look at:
- The negative impacts of noise – and not the positive impacts of “soundscapes”
  - The benefits of active travel – and not the costs of inactivity
  - The cost of opportunity of travel time – and not the benefits of productive or enjoyable travel time
  - The benefits at trip destinations – but not the costs at trip origins and at alternative destinations

- 1.81 Capturing some of the impacts on people and places also requires going beyond current appraisal paradigms and developing new concepts and methods, to capture aspects such as:
- The value of “place”
  - Benefits of travel time use
  - Benefits of trip suppression (due to working/shopping from home)
- 1.82 Widening the scope of appraisal to include impacts on people and places increases the risk of double counting and calls for new approaches to isolate the value of the activities that people do in places or while travelling from the value of being exposed to the surrounding physical environment when doing those activities.
- 1.83 An issue that emerged in all discussions was that the distributional impacts related to people and places currently do not get the attention they deserve. These impacts have two dimensions: a social dimension (i.e. imbalance in the distribution of positive and negative across social groups) and a spatial dimension (i.e. positive impacts that imply negative impacts elsewhere).
- 1.84 Another conclusion is that moving forward requires more complex methods, both to start estimating the wider indirect impacts of transport interventions and to assess the direct impacts in more detail than it is currently done.
- 1.85 Overall, the major disagreement point among workshop participants was about the pragmatics of using complex methods. Is it realistically possible to identify all the multiple cause-effect relationships between transport, health, environment, and land use? And if yes, are the additional benefits and costs captured with the new methods big enough to justify the extra modelling effort?
- 1.86 Discussions on the topic of complexity lead in several instances to discussion about more fundamental issues on transport appraisal guidance, namely whether the best approach is the incremental improvement of WebTAG, or if there is a case for a completely new style of transport appraisal guidance. This was also evident in discussions in two of the groups (healthy people and places and location attractiveness), where some participants raised the question of whether transport appraisal should focus on schemes or on policies.
- 1.87 There was consensus that enhancing WebTAG and adding complexity requires joined-up efforts. For some participants this meant simply the harmonisation of methods used by different transport policy-makers. Other participants suggested that this is not enough, and more bridges should be built within and between the public and private sectors, which could be achieved for example, by opening-up data and software.
- 1.88 Some participants were optimistic that the increased availability of “big data” allows for more robust revealed preference analyses to value the direct and indirect impacts of transport schemes. However, this optimism should be tempered with (at least) two concerns. The first is that to address impacts on people and places, methods based on preferences need to be balanced with methods focusing on subjective wellbeing and life satisfaction. The second is that the success of modelling and appraisal methods is dependent on improvements in methods for option generation - the stage that one participant identified as the most neglected in transport decision-making.
- 1.89 Improving WebTAG also requires learning from experience, i.e. putting more effort on the evaluation of transport projects, to derive a richer understanding of their impacts, which can be used to inform appraisal. There is a need to only to produce more

evidence but also to build a database bringing together evidence that already exists but is scattered.

- 1.90 Because impacts on people and places have wider consequences, there is also a need to learn (and use) work done in other governmental departments and other sectors, such as environment, health, housing, and labour markets. This could be fruitful to assess policies that affect all these sectors, such as urban regeneration.

## 2. Reflecting uncertainty over the future of travel

### Introduction

- 2.1 This chapter reports on the workshop held to discuss "Reflecting uncertainty over the future of travel".
- 2.2 The workshop was organised and chaired by Professor Richard Batley of the Institute for Transport Studies, Leeds, and held at Great Minster House, London, on Friday 14th September. Invitations to the workshop were issued to specific individuals/organisations with particular interest and/or expertise in the theme of uncertainty, drawn from a wide range of stakeholder organisations.
- 2.3 The attendees were as follows: Barry Meehan (DfT); Claire Worsdall (DfT); Fitsum Teklu (Systra); William Hiscock (Systra); Mohsin Munshi (Mott MacDonald); Rahulan Chandrasekaran (TfL); David Harding (Network Rail); Tim Gent (Atkins); Keith Homer (TfWM); Angele Harris (Network Rail); Julian Laider (TfGM); Richard Bradley (TfN); Stephen Cragg (Transport Scotland); James Fox (Rand); Sarah Rae (NIC); Laura Comeau (TfL); Marcus Chick (HE); Stephen Cragg (Transport Scotland); Joanne Gomez (RDG).
- 2.4 The objectives of the workshop were three-fold:
  - To gather intelligence about different areas of uncertainty and methodologies for addressing uncertainty in modelling and appraisal.
  - To review the suitability of WebTAG guidance on the treatment of uncertainty, and identify areas for improvement.
  - To shape the specification of more detailed research which might support further development of WebTAG on the treatment of uncertainty.
- 2.5 The summary of the discussion below has been written by Richard Batley (ITS Leeds) and does not necessarily reflect the views of DfT.

### Format of the workshop

- 2.6 The workshop began with Richard Batley laying out the territory around uncertainty in modelling and appraisal – by summarising a ‘stocktake’ paper which he had been commissioned to write by the Department<sup>4</sup>. With this as the motivating material, there was then plenary discussion to review the scope and objectives of the workshop – and agree any adjustments. The workshop then split into two breakout groups facilitated by DfT officials (Barry Meehan and Claire Worsdall from Transport

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<sup>4</sup> This stocktake will be published as an annex to the Joint Analysis Development Panel's annual report later this year.

Appraisal and Strategic Modelling (TASM) division), to undertake group work in two areas as follows:

#### 2.7 Breakout 1:

- What are the key sources of uncertainty and how can we deal with them?
- What are the key sources of uncertainty which affect modelling and appraisal?
- What can we do to mitigate these uncertainties?
- For uncertainties that remain, how best can we deal with them in modelling and appraisal?

#### 2.8 Breakout 2:

- How should we account for modelling and appraisal uncertainty in WebTAG?
- Is the current treatment of uncertainty in WebTAG adequate? Which parts are good/not so good?
- Is there support for the concept of an 'uncertainty toolkit'? If not, is there a better way of enhancing WebTAG guidance on the treatment of uncertainty?
- What should be included within an uncertainty toolkit?
- What research is needed in order to enhance WebTAG guidance on the treatment of uncertainty?

2.9 The final session of the day was a further plenary session to pull together key points from the workshop.

## Summary of the uncertainty stocktake

2.10 The objectives of the uncertainty stocktake were as follows:

- To inform TASM thinking on possible updates to WebTAG guidance on the treatment of uncertainty.
- Help to inform the specification of more detailed research which might be undertaken
- To gather intelligence about different areas of uncertainty and methodologies for addressing uncertainty in modelling and appraisal
- To create an indicative list of research priorities; and
- To provide suggestions for the possible format of the research.

2.11 The stocktake concluded that WebTAG encompasses guidance on various aspects of 'uncertainty' (broadly defined) within the modelling and appraisal process, and the quality of some aspects of this guidance (e.g. on scheme costs) is very respectable. Furthermore, the ongoing TASM work on scenario analysis might be considered best (even leading) practice for national transport ministries. However, in totality, TAG guidance on uncertainty gives the impression of having evolved in a rather ad hoc and fragmented fashion over time.

2.12 Against this background, the stocktake issued a series of recommendations, as follows:

- R1: The priority should be to review – and where necessary refresh – existing WebTAG assets, with the objective of delivering a coherent ‘toolkit’ to deal with uncertainty in transport modelling and appraisal.
- R2: The purpose of the ‘toolkit’ should be to equip practitioners with sufficient guidance to enable them to investigate and report key sources of uncertainty in modelling and appraisal in a systematic and consistent fashion.
- R3: As and when such guidance is developed and released, a longer-term priority should be to form an overview on the key sources of uncertainty – especially if these are in areas where the Department could take action to mitigate.
- R4: A three-package work programme is proposed for drafting, testing and finalising the proposed uncertainty ‘toolkit’, as follows:
  - WP1: Draft guidance on the uncertainty ‘toolkit’
  - WP2: Case study analysis of uncertainty mitigation
  - WP3: Update guidance on the uncertainty ‘toolkit’ and issue research recommendations
- R5: The optimal team for this work programme would be some combination of practitioner (bringing insight on practical context) and academic (bringing insight on methods), but would need active contribution from the Department.

### Notes from the opening plenary session

- 2.13 The initial point made was that, in practical terms, WebTAG is only used when scheme promoters are looking to secure funding for a scheme. At this stage, it is typically the case that scheme promoters have already determined the scheme and preferred option. It is therefore too late for WebTAG to meaningfully impact on how schemes take uncertainty into account in the development of schemes. Moreover, given the adversarial nature of the funding process, WebTAG is often used retrospectively to justify an existing choice.
- 2.14 Following from the above point, there is scope to promote WebTAG as a tool to be used on an ongoing basis throughout the appraisal process.
- 2.15 WebTAG may not be the right place for DfT to encourage schemes to engage with uncertainty analysis – which needs to be early in the scheme development process.
- 2.16 There is a distinction between ‘scenario planning’ which can help determine the best approach for a scheme, and ‘sensitivity analysis’ which can demonstrate the robustness of a scheme within any given scenario. Both methods should be incorporated into guidance.
- 2.17 Scheme promoters should be incentivised to consider uncertainty at the development and option selection stage.
- 2.18 Decision-makers should be equipped with guidance to help them make decisions in the face of uncertainty.
- 2.19 There is a disconnect between the tools used for developing economic narratives and building the economic case. In particular, it can be difficult or indeed impossible to explore uncertainty using the same tools that underpin the economic case.
- 2.20 There was general agreement on the distinction between the treatment of uncertainty in modelling vs. appraisal.

- 2.21 Bias is different from uncertainty. There are known behavioural biases, and these should be separated out from issues around optimism bias.
- 2.22 There is a fundamental assumption that uncertainty arises because we try to predict how people travel in the future, but the Department's approach of 'predict-and-provide' is not the only way to do things. Some sub-national bodies such as TfGM take a 'decide-and-provide' or 'vision-and-validate' approach, whereby they decide what they want the future to look like and create policies which make that future more likely. This can reduce the uncertainty as the public body is using the tools at their disposal to narrow the uncertainty. Techniques such as real options analysis and adaptive decision-making can be leveraged to make a scheme more resilient to future uncertainty.
- 2.23 It is important to think carefully about how uncertainty is presented to decision-makers. There is a possibility that if decision-makers are presented with too much information they may struggle to synthesise it and make effective decisions. Guidance could be developed for decision-makers as well as for practitioners.
- 2.24 Scenarios should be used in conjunction with forecasting and monitoring so that we can understand which scenario we are moving towards and adapt the scheme accordingly.
- 2.25 There was a discussion on whether it was possible to deliver guidance on uncertainty given the difficulty in dealing with the topic. There was agreement that guidance should focus on the process of addressing uncertainty and not be too prescriptive in terms of the uncertainties addressed for each scheme.
- 2.26 There was discussion on whether the Department could help with longitudinal data and inferences around how to establish when a trend is developing in noisy data.
- 2.27 A final point was around the uncertainties in our transport models. Namely, are the algorithms that underpin our models relevant in a 2050 scenario? Technology may change people's behaviour in a way that affects the way our models work.

### Notes from Breakout 1 – Table 1

- 2.28 Discussion began by considering some of the main sources of uncertainty – firstly looking at population. Population growth was considered to be a major source of uncertainty in London – but also very important outside of London. It was felt that a major uncertainty was whether the current trend of urbanisation would continue.
- 2.29 The group then spoke of categorising uncertainty in terms of 'exogenous' vs. 'endogenous' uncertainty. It was suggested that within the endogenous grouping there were degrees of control. i.e. the uncertainty could be endogenous to the local authority, the DfT or the Government as a whole. Endogenous uncertainty could be controlled and mitigated against more easily than exogenous uncertainty.
- 2.30 The example of Heathrow rail station was cited where the value for money of the scheme was entirely dependent on the third runway – and hence represented a significant uncertainty over which the Government has some control.
- 2.31 TfN gave an example of how they have represented uncertainty, conceptualising two axes of uncertainty – whether future travellers will be selfish or shared and whether people will prefer face-to-face interaction or interact digitally.
- 2.32 The question was raised of whether existing models are capable of quantifying stretching scenarios. Practical experiences from the group suggested that models



may sometimes struggle to match supply and demand in more stretching scenarios – leading to convergence issues. Such issues may limit the testing of uncertainty.

- 2.33 It was highlighted that many of the inputs and parameters that we use in models are averages – and that this practice obscures the inherent uncertainties in the input/parameter distributions.
- 2.34 There was broad consensus that simpler tools would be beneficial to be able to test more options and more scenarios. It was suggested that the WebTAG modelling approach was too complex and too expensive to be able to properly test uncertainty. TfN gave an example of a programme of over 300 schemes and that testing uncertainty with current tools was extremely difficult.
- 2.35 The use of elasticity-based models could be used to more easily understand uncertainty – an approach which has tradition in the rail industry. The group discussed the difficulty of exploring significant uncertainty in elasticity-based models, as when there are large changes in the underlying variables the point estimates of elasticity are less robust. The group talked about overcoming this by estimating full demand curves rather than just looking at elasticity.
- 2.36 Another suggestion made was that we should move from equilibrium tools to system dynamic tools.
- 2.37 There was a discussion about the role of WebTAG and who it was for. The group discussed the benefits of having a ‘level playing field’ set out by WebTAG from the perspective of central government who are deciding which schemes to fund. However, there may be costs of taking this approach, as it gives less flexibility for promoters to approach problems in ways that fit their specific needs. For example, NTEM 7.2 establishes a common base for all schemes, but models at the national level and does not always adequately reflect local issues. This is exacerbated if, for example, a rail scheme is dependent on the population density of a very small area (e.g. at ward level) in the centre of cities.
- 2.38 To ensure a level playing field, it would be beneficial if DfT could ensure that models have consistent base data so that it was easier to work across models.
- 2.39 There was brief discussion around whether we could make use of AI and machine learning techniques.
- 2.40 There was a degree of support for the idea that it was more important to have a scheme that was robust to multiple scenarios rather than one scheme that was optimal in one scenario. We discussed how DfT could influence promoters to consider uncertainty in the initial pre-funding stages. DfT could give a project a ‘poor’ value for money category if the project team fails to demonstrate that they have adequately considered uncertainty in the initial planning stages.
- 2.41 The point about providing guidance for decision-makers (as well as analysts) was raised again. The group looked at switching value analysis not just in terms of the change to the value for money category, but also to determine option changes. The question was raised: “what would have to happen for a different option to be optimal?”
- 2.42 TfL talked briefly about their scenario work and how they have tried to avoid high/low/central approaches.
- 2.43 There was a brief discussion around how far into the future it is necessary to model. It was noted that some schemes are being appraised with only a couple of modelled years because their opening dates extend into the 2040s.



## Notes from Breakout 1 – Table 2

- 2.44 A number of high level points were made about sources of uncertainty, including the context in which uncertainty is being considered (scheme level or national transport strategy), and the extent to which uncertainty is exogenous – there are factors over which government (central, regional, local) has some control e.g. council decisions over land use.
- 2.45 It was also observed that we should better recognise uncertainty in reflecting the current situation in models, as data around current employment and trips is limited.
- 2.46 It should be recognised that there are ‘known’ uncertainties as well as ‘unknown’ uncertainties.
- 2.47 Specific sources of uncertainty to consider should include:
- Uncertainty around future land use: local plans do not extend out beyond 5 years but we are appraising over 60 years. Therefore, further guidance on reconciling future land use plans to NTEM would be useful.
  - Political uncertainty is also important.
  - Technological uncertainty is key, particularly consideration of new, alternative modes and behavioural responses to them.
- 2.48 The question was asked: “how broadly is uncertainty considered by decision-makers?”
- 2.49 The discussion highlighted that there is uncertainty in modelling inputs, within the model itself, and in the values used to monetise impacts, all of which need to be considered.
- 2.50 Uncertainty logs should be used to break down uncertainties further, but they are currently focused on the assumptions in the Do Minimum. Such logs should flag critical risks for review.
- 2.51 In considering how much analysis of uncertainty is required, we may want to consider different metrics for VfM, including payback periods. If a payback period is short, then we may care less about reflecting uncertainty over the longer-term.
- 2.52 We should not necessarily seek to deal with uncertainty mathematically or during the modelling process, but rather aim to unpack uncertainty and be honest about its sources.
- 2.53 In general, avoiding multiple model runs is helpful, but ranges can be useful.
- 2.54 A key factor for consideration is model design. Current tools are operating beyond their design limits. We need to consider what tools are appropriate for consideration of uncertainty at different points in the decision-making process. In particular, we should consider coarse- vs. fine-grained modelling, with the former being appropriate for capturing uncertainty at early stages in scheme development. Models need shorter run times if they are going to be used for sifting options. Transport Scotland cited the example of using an Excel spreadsheet as a scenario tool to test the robustness of different options against a number of futures.
- 2.55 On a related note, we need to consider what is appropriate information to provide at a particular decision point and for different types of decision: portfolio, programme and scheme.

- 2.56 Other approaches include working backwards from a BCR to focus on the specific impacts that would shift the BCR and hence the VfM category.
- 2.57 There is a need for a culture shift, with Ministers and decision-makers free to admit uncertainty and to be more open on dependencies.
- 2.58 There is the potential to find out how other government departments treat uncertainty and learn lessons from those insights.
- 2.59 Decision-makers require information to be presented in a succinct and clear way, with visual representations likely to help this process. We should however consider the merits of narrative as well as numbers in presenting uncertainty.
- 2.60 Decision-makers want confidence that schemes are resilient.
- 2.61 'Named' scenarios/scenario planning are a useful tool for highlighting uncertainty as they are easy to engage with.
- 2.62 There should be consideration of exit strategies if things do not work out i.e. alternative uses for the infrastructure and implications for the VfM.
- 2.63 We need to provide information about which decisions close off possible future paths.

### Notes from Breakout 2 – Table 1

- 2.64 The group first discussed WebTAG's current approach to uncertainty. The group felt that the guidance was very fragmented when it comes to how uncertainty was represented in WebTAG. The group also felt that it was very limited in how it dealt with uncertainty.
- 2.65 There was nothing about how promoters should forecast scenarios. There was also a feeling that promoters were constrained by NTEM 7.2. There was reiteration of the point that WebTAG has influence at the wrong stage of the process and that uncertainty needs to be considered early on.
- 2.66 Such is the breadth of schemes covered by WebTAG – from minor road improvements to major rail schemes – it is difficult to provide guidance on uncertainty that is applicable to the full range.
- 2.67 There was agreement that DfT should not be overly prescriptive about which sensitivity tests schemes should use – but instead focus on the process of identifying uncertainties and deciding how stretching to be.
- 2.68 There was a disagreement at the table around whether DfT as a funding provider should move towards a 'decide-and-provide' approach or enable scheme promoters to do so. Some in the group felt it would be difficult for DfT to validate the work of scheme promoters using such an approach, and that comparison between schemes would be difficult. Countering this point, the example of Norway was cited, which allocates funding based on how well schemes help to achieve policy objectives.
- 2.69 There was discussion about how DfT can influence transport planning before schemes try to secure funding. The group came up with three possible approaches:
- DfT could take a more active role in working with scheme promoters throughout the transport planning process.
  - DfT could devolve the process and funding to regions.
  - DfT could require schemes to demonstrate that they have considered uncertainty appropriately in the transport planning process when they apply for funding.

- 2.70 The group felt that some methods of dealing with uncertainty are difficult to validate and easy to game. Monte Carlo analysis was cited as an example. There was discussion about transparency of analysis, and how external scrutiny could promote 'honesty' in the input assumptions.
- 2.71 There was also discussion of the possibility of publishing evidence papers before publishing analysis of preferred options etc. The group felt this could improve transparency and the threat of external scrutiny could reduce the risk of gaming.
- 2.72 There was consensus that guidance on different tools to address uncertainty in a proportionate way should be included in the toolkit. These should not be prescriptive on particular inputs and ranges but should give guidance on the best overall approach in certain circumstances.
- 2.73 The consensus was that publishing ranges around inputs and parameters would not be a good idea because the ranges will differ at a local level and many of the main uncertainties do not have quantifiable uncertainties.
- 2.74 There was support for the idea of the toolkit including case studies around schemes which could be held up as best practice in addressing uncertainty in modelling and appraisal.
- 2.75 A question was raised about whether DfT is the right body to publish such guidance – in particular, is DfT agile enough to keep pace with the leading edge of best practice? A discussion followed about the trade-off between authority and flexibility. There was a feeling that DfT is the only organisation with sufficient authority to deliver the toolkit, and it was acknowledged that development of the toolkit itself would likely be outsourced.
- 2.76 One participant argued that the toolkit should avoid spurious quantification of uncertainty.
- 2.77 The group talked about the power of scenario planning in option development, option choice and robustness checks.
- 2.78 In terms of research priorities, the only idea presented was to evaluate the tools currently presented in WebTAG against outturn data to understand if they are still the best models.

### **Notes from Breakout 2 – Table 2**

- 2.79 It was felt that the treatment of uncertainty in WebTAG is very focused on the development of uncertainty logs, which tend to focus on the scheme assumptions made in the Do Minimum and the uncertainties around land use.
- 2.80 There were reflections around the use of common language about uncertainty and it was felt that WebTAG is not at present particularly helpful in this regard. Clear and consistent definitions for terminology (e.g. sensitivity test, scenario, Do Minimum) are key.
- 2.81 The current guidance does not talk about uncertainty in the assignment stage of the modelling – setting up the base year is very important in this regard.
- 2.82 It was felt that an uncertainty toolkit would not be useful if it stands alone. The consideration of uncertainty needs to be integral to the way of thinking throughout the appraisal and modelling process, with a focus on the requirements of decision-makers and the decision-making process given uncertainties.

- 2.83 Some members of the group were concerned about the terminology used and thought we should talk about 'tools' rather than a 'toolkit'. A toolkit could suggest an add-on to core analysis when techniques to consider uncertainty should be used throughout the process of developing a business case.
- 2.84 It was questioned whether current guidance supports treatment of uncertainty throughout the five elements of the business case. Participants noted that WebTAG is guidance to support the development of the economic case, but felt that consideration should be given to the wider decision-making process and whether higher-level guidance might be appropriate.
- 2.85 A particular issue raised was whether there should be guidance on different tiers of modelling which are suitable for informing decisions at different stages of business case development.
- 2.86 One suggestion was that NTEM could be further developed as an open-source tool for scenario analysis – since all the key levers which could be used to test uncertainties are already built into NTEM.
- 2.87 There was discussion about the impact of devolution and the extent to which risk is being shifted outside of central government. What do devolved bodies want in terms of guidance on uncertainty? Should they develop their own guidance? What is the function of WebTAG in this regard?
- 2.88 Consideration needs to be given to the level of prescription in WebTAG. ideally the guidance should allow a multiplicity of approaches, with options for developing different tools and models. Guidance should be couched in terms of specifying outcomes and outputs.
- 2.89 The prominence of uncertainty in the guidance needs to be raised.
- 2.90 Some challenges to implementation of new guidance in this area were identified including embedded attitudes/practice and tendency to focus on a core scenario. The discussion also highlighted the need to consider the skills implications of new guidance and the capacity of the industry to absorb and implement changes. Development of skills will not necessarily happen organically in consultancies.
- 2.91 Research may be required to consider how to capture 'disruptors' which we cannot currently model.

### **Closing plenary session**

- 2.92 The final session invited conclusions from attendees of the workshop, and the following points were volunteered in response. These should be seen as individual responses which do not necessarily reflect a consensus.
- 2.93 There is a need to consider the structure of guidance and who it is aimed at. Distinct groups of people may have different requirements – appraisal practitioners; planners; programme and portfolio funding decision-makers.
- 2.94 Guidance should consider how to treat exogenous and endogenous uncertainties – defining endogenous uncertainty may depend on who the sponsoring organisation is.
- 2.95 There is a need for a systematic framework – scenario planning is suitable at the optioneering stage, whilst scenario and sensitivity analysis are suitable at the appraisal stage.

- 2.96 There should be consideration of how to incentivise good uncertainty analysis – including through specifying required outputs (for example in the appraisal summary table).
- 2.97 TfN highlighted that they already have a toolkit and an analytical framework for considering uncertainty – and that there should be joint working with DfT to capture these insights.
- 2.98 The role of uncertainty should be captured early on in business case development through the strategic case.
- 2.99 In order to engage decision-makers, uncertainty should be framed within the context of the risk they are taking on.
- 2.100 The ongoing work on strengthening WebTAG’s treatment of uncertainty should be seen as a staging post on the road to a more ‘vision-focussed’ approach to transport planning, with consideration given to developing adaptive planning and real options analysis.
- 2.101 Transport planning is not unique in dealing with uncertainty and we should look to the wider world to consider how best to capture and present it.
- 2.102 Uncertainty has implications for the model development process – we need to consider issues such as placeholders for CAVs in models, and the run time for models when considering multiple scenarios.
- 2.103 “Uncertainty is fundamentally unquantifiable”.

## Richard Batley’s summary

### **Introductory comments**

- 2.104 First and foremost, it is important to agree terminology, and there was no apparent objection from workshop attendees to the Oxford English Dictionary’s definition of ‘uncertainty’, as follows:
- 2.105 “The quality of being uncertain in respect of duration, continuance, occurrence, etc.; liability to chance or accident. Also, the quality of being indeterminate as to magnitude or value; the amount of variation in a numerical result that is consistent with observation”.
- 2.106 There was however acknowledgment that, in transport modelling and appraisal practice, the term attracts a broad interpretation – drawing in related concepts such as ‘risk’ and ‘error’. In what follows, the broadest definition will be adopted.
- 2.107 The notion of uncertainty in transport modelling and appraisal is complex and multi-faceted. It would seem to manifest in different ways to different agents within the modelling and appraisal process. As of consequence, any single agent in the process (e.g. modeller, appraisal analyst, DfT official) may not necessarily have full oversight of the inter-relationships between different sources of uncertainty (broadly defined), and/or their cumulative effect on the precision and robustness of appraisal outcomes.
- 2.108 At a conceptual level, there are perhaps two broad dimensions of uncertainty especially relevant to DfT:
  - The precision of models – in terms of both inputs and outputs – may impact upon the robustness of appraisal results.
  - Practical modelling and appraisal is being conducted over longer timeframes within an increasingly uncertain world.

2.109 With reference to the objectives of the workshop, key points made by attendees can be summarised as follows:

- To gather intelligence about different areas of uncertainty and methodologies for addressing uncertainty in modelling and appraisal.
- There was support for the idea of establishing a typology of sources of uncertainty, especially distinguishing between notions of ‘exogenous’ and ‘endogenous’ – where the defining characteristic was whether the source of uncertainty was under the control of a given organisation.

2.110 With regards to specific areas of uncertainty, the following were identified as important areas to understand:

- Population growth, and especially the rate of urbanisation;
- Land use, and especially the mis-match between 5-year local plans and 60-year appraisal periods;
- Political uncertainty;
- Technological uncertainty, especially new modes and behavioural responses to them.

2.111 With regards to methodologies, a point which attracted lively debate was the suggestion that uncertainty is especially prominent in the modelling and appraisal process because the dominant paradigm is ‘predict-and-provide’. It was argued that the alternative paradigm of ‘vision-and-validate’ – coupled with tools such as real options analysis and adaptive decision-making – can make a scheme more resilient to future uncertainty. A counter-argument was the suggestion that DfT might encounter difficulties in validating the work of scheme promoters employing such an approach, and that comparison between schemes could be more difficult.

2.112 To review the suitability of WebTAG guidance on the treatment of uncertainty, and identify areas for improvement.

2.113 There was general discussion about the role of WebTAG and who it was for. It was acknowledged that there is an inherent tension between promoting consistency of approach in the modelling and appraisal of schemes – which helps to establish a ‘level playing field’ for determining funding priorities – and giving scheme promoters licence to develop bespoke solutions which might better suit local contexts.

2.114 There was widespread support for the argument that WebTAG should be promoted from start-to-finish through the modelling and appraisal process – to counter the practice of scheme promoters enlisting WebTAG only when the scheme has been determined and funding is being sought.

2.115 In a similar vein, the point was made that WebTAG may not be the best place for DfT to encourage schemes to engage with uncertainty analysis specifically – since this needs to be early in the scheme development process.

2.116 There appeared to be consensus that WebTAG is at present rather limited in its treatment of uncertainty, and that relevant parts of the guidance are fragmented. At the same time, it was acknowledged that, such is the breadth of schemes covered by WebTAG, it will not be easy to develop guidance on uncertainty that is applicable to the full range.

2.117 There appeared to be support for DfT’s proposal of an uncertainty ‘toolkit’, but thought needs to be given to various aspects of detail, as follows.



- 2.118 There was agreement that DfT should not be overly prescriptive about which sensitivity tests schemes should use – but should instead focus on the process of identifying uncertainties and deciding how ‘stretching’ to be.
- 2.119 There was consensus that guidance on different tools to address uncertainty in a proportionate way should be included in the toolkit. Again, this should not be prescriptive on particular inputs and ranges but should give guidance on the best overall approach in certain circumstances.
- 2.120 It was felt that prescribing ranges around inputs and parameters would not be a good idea because the ranges will differ at a local level and many of the main uncertainties do not have quantifiable uncertainties.
- 2.121 There was support for the idea of developing case studies around schemes, which could be held up as best practice in addressing uncertainty in modelling and appraisal.
- 2.122 In a slightly different vein, one attendee argued that the toolkit should not necessarily seek to deal with uncertainty mathematically or during the modelling process, but rather aim to unpack uncertainty and be honest about its sources.
- 2.123 To shape the specification of more detailed research which might support further development of WebTAG on the treatment of uncertainty.
- 2.124 It was highlighted that, in seeking to account for multiple sources of uncertainty over a significant timeframe, current modelling tools are operating beyond their design limits.
- 2.125 It was felt that different tools may be required at different stages in the decision-making process. At the same time, proportionality should be exercised in terms of model scale, detail and the range of scenarios considered – all of which have implications for model run times and modelling resource.
- 2.126 There was a particular appetite for simple tools that allow rapid testing across a range of schemes and scenarios.

### **Some general reflections**

- 2.127 There was discussion about whether DfT should be the custodian of the uncertainty toolkit. On balance, it was agreed that DfT is the only organisation with the authority to deliver the toolkit, but that the technical content should be outsourced to relevant experts.
- 2.128 There was discussion about the impact of devolution, and whether this places an onus on sub-national organisations to develop their own versions of guidance on uncertainty. This question was left unresolved.
- 2.129 Last but not least, it was highlighted that, should DfT seek to substantively update guidance on uncertainty, then they should consider the capacity of the industry to absorb and implement such change. In particular, DfT might need to show community leadership in promoting any necessary skill development.

### 3. Modelling and appraising transformational investments and housing

#### Introduction

- 3.1 The Modelling and Appraising Transformational Investments and Housing workshop was chaired by Professor Tony Venables of Oxford University, and held at Windsor House, London on Thursday 4th October. Invitations to the workshop were issued to specific individuals/organisations with particular interest and/or expertise in the theme, drawn from a wide range of stakeholder organisations.
- 3.2 The attendees were as follows: Chelsea Dosad (KPMG); Chris Campbell (DfT); Cynthia Kalyan (MHCLG); Damian Walne (HS2 Ltd.); Daniel Sturm (LSE); Daniel Hanson (PWC); David Metz (UCL); James Laird (ITS Leeds/Private Consultant); Jeremy Clarke (Highways England); Michele Mazza (BEIS); Phil McCann (University of Sheffield); Roger Vickerman (University of Kent); Tom Simpson (DSC); Tom Worsley (ITS Leeds/Private Consultant); Sarah Rae (NIC); Matt Shepherd (Oxera); Josh Nava (DfT); Claire Worsdall (DfT); Iven Stead (DfT); Becky Smith (DfT); Shreya Nanda (DfT).
- 3.3 The workshop was organised around two issues.
- What is the evidence on the transformational effects of transport improvement, what further evidence is needed to inform appraisal, and how can the evidence be obtained?
  - How good are existing modelling techniques used for project appraisal, can they capture transformative effects, and how can they be improved?
- 3.4 The summary of the discussion below has been written by Tony Venables (Oxford University) and does not necessarily reflect the views of DfT.

#### Part 1 - Evidence: The transformational effect of transport improvements

##### Presentations

- 3.5 The session started with three short presentations on the impact of transport improvements and their transformative impact (potential or actual) on the local and national economy,
- 3.6 Professor Daniel Sturm (London School of Economics) outlined new techniques of Quantitative Spatial Modelling which can be used to rigorously establish the effects of transport investments. The application he discussed was based on the effect of



building railways in London between 1841 and 1921 (steam train network and underground) and the impact on London's economic geography. Its innovation is to use a structural model and fine spatial data to separate out the distinct effects of the railway network from all the other forces driving change in the London economy throughout this period. Using the model to 'simulate backwards', it does a good job of identifying the effects of the railways on population and employment. Structural models fitted to actual data are an important element of a new evidence picture.

- 3.7 Professor Roger Vickerman (University of Kent) outlined what has been learnt from case studies of High Speed Rail (HSR), emphasising several points.
- 3.8 First, we do not have much evidence on the effects of HS1, and it is virtually impossible to show that HS1 has had a transformational impact in Kent. But it also opened at an unfortunate time – 2009 – coinciding with the global recession and Pfizer closing its research centre at Sandwich. Very large projects, such as the Channel tunnel, don't necessarily have big local impacts as they are part of a bigger network so effects are dissipated.
- 3.9 From the French example, the construction of 3 main lines out of Paris had regional effects in Paris, Lille and Lyon that benefitted relative to their hinterlands, but little effect on the balance between Paris and other big cities like Lyon and Lille.
- 3.10 The broad evidence from China – where the network is intended to lead to more economic development in the West and South – so far suggests that this is working, and rebalancing away from Beijing, Shanghai and the coast.
- 3.11 Important messages are not to focus just on headline results, such as growth and productivity, but to look at underlying structure and behavioural changes. Vickerman argued that it's not just about changing growth rates, it's about changing structure – including occupational and skills structure. Studies of the French experience suggest that an important impact of HSR is increased specialisation within business – moving particular functions around. These are agglomeration effects working at the level of skills in the labour market. HSR also has impacts on the knowledge economy. People who travel on HSR are relatively likely to work in innovative sectors, and HS1 may have had an impact growing the knowledge economy in Tunbridge Wells.
- 3.12 Finally, integrating the local transport into the HSR network is absolutely critical as is the generation of developments around stations.
- 3.13 Professor Philip McCann (University of Sheffield) focussed on the problem of lagging regions, making three main points. First, the UK has been partitioning in the last 20-30 years into 3 distinct countries economically. One is London and its hinterland, with an experience completely different from the rest of the country. The second is Scotland, with its own institutional drivers taking it down a distinct economic path. And third, the rest of the country, with generally very weak productivity performance.
- 3.14 Transport can play a role in improving economic performance, but the key issue is whether it can change the expectations of private investors. This is an area where we have little or no evidence, and where traditional micro-economic modelling techniques are not very useful. Integrating different modes of transport has significant impacts compared with a new investment in isolation. For example, transport improvements where they link modalities, as occurs in Germany and the Netherlands (and London with the Oyster card system), but is generally absent in the rest of the UK.

## Discussion

- 3.15 Discussion focussed around five issues, and points made are summarised below:

## Missing and new sources of evidence

- There is a (severe) lack of UK evaluation evidence, for example the West Coast Mainline, the InterCity 125 and HS1 have never been fully evaluated. This is a big gap – how do we evaluate transformative schemes we've already done, so we can better appraise future schemes?
- There has been some good hedonic pricing research done on intra-city rail and tram schemes but a lot less on inter-city schemes, perhaps not surprisingly because the effects of such schemes are dispersed over a wider area.
- In addition to failing to do complete, long term ex post evaluation of projects, little has been done to validate modelling techniques, such as LUTI (Land Use and Transport Interaction models) and SCGE (Spatial Computable General Equilibrium), that have been used in appraisal.
- There needs to be systematic collection of data to undertake ex-post evaluations and test models. A programme of good independent evaluation for UK transport schemes is needed, and should also be used to validate appraisals for those schemes
- It might be possible to make better use of information from real estate investors – they have a lot of data but it's not often used in research. They match their data on UK cities with other countries' cities as well as comparing assets. They use both official statistics (the fundamental features of an area) and market data such as yields and discount rates to inform decision making.
- Real estate investor data has the problem of being quite short term. It is very difficult to predict a step change in the economy. Market evidence is part of the solution but not the full answer (need long term case studies too).
- Land value uplift data may be useful but faces big challenges:
  - It was suggested by one participant that LVU can be sufficient for small sites and short term, but for larger/longer term projects you need a different approach.
  - It was argued that in some cases it can be difficult to separate predictions in changes in land from property values. For example, the 2012 Olympics created a lot of redevelopment and increases in land values but house prices around Stratford did not change as much as anticipated.
  - Concerns about the short-term stability of property price data, is the public sector truly backing a place? Anticipatory effects may be seen in property prices.
  - How to understand quality of place impacts when valuing housing impacts, they are always perceived to be good? This is easy at a local level but harder at the national level.
  - It was explained by one participant that MHCLG are very much aligned to commercial aspect of appraisal – that is developers will use LVU. Furthermore, small scale development should have a RICS valuation.
- Participants noted that it is important to improve links with the data science industry to develop tools and techniques. Better use of big data initiatives would shed light on the characteristics of places and how people travel e.g. Mappiness data – people input how they feel on their mobile phone and then it records their location, comparing it with background data and proximity to transport hubs such

as airport. Or, mobile phone data could be used to gain insight into how people travel, how this has changed over time and compare to productivity of companies.

- There are major gaps in our understanding/evidence around multi-modal issues, what is influencing local level land values and what influences decision making by businesses and households. A major gap is modelling impacts and benefits of integrated transport systems (e.g. “Northern Oyster Card Scheme”), this is incredibly challenging.
- The value of business time savings – do people on HSR really value the time saved because they can work on trains (or watch TV)?
- Some suggested central government should collate local authority planning data and provide regional input-output data; and that modelling is held back by missing regional trade flows data.

### **Understanding local labour markets**

- The impact of transport improvements is quite different for different skill/occupational types:
  - Highly skilled, internationally mobile workers (group 1); and,
  - Lower skilled, locally focused workers (group 2).
- It was suggested that thinking of transformational impacts in terms of different cohorts of people and core versus hinterland regions, mobile individuals in group 1 will benefit the most from investments such as HS2.
- In contrast, it was questioned by one participant how much evidence do we have that transport can help those at the bottom of the labour market, they argued that lower skilled (group 2) will only benefit from transport investments such as HS2 if they create changes in property prices as these people work and live locally.
- What should be part of a labour market checklist for deciding if a scheme is going to have transformational investments?
- Is there evidence (that we can robustly utilise in appraisals) that there are differences in the length of time people at different skill levels will travel to access a job e.g. 20-30 minutes for retail jobs versus much longer commutes for highly skilled occupations.
- There is an issue associated with potentially transformational investments and assessing time savings. HS1 is a commuter rail to London, it is not creating much reverse commuting. The reliability is so much greater that people just use HS1 instead of local rail.
- There are two major demographic changes going on that affect the appraisal and evaluation of potentially transformational investments: the ageing population and multiple workers in the same household. These are making the choice of residential locations much more difficult. Families are now more scattered so people are also travelling more for leisure as well as work.
- What evidence do we have on the impact of transport on occupational structures? Need to look at how investments change the composition of jobs. BEIS recently commissioned research to consider the impact of commercial developments on the local economy.

- Can we improve our understanding of the extent to which failures like underemployment in an area are due to transport failures, skills failures or other reasons?
- Research into the scale and nature of employment responses to changes in transport connectivity – a prerequisite to agglomeration impacts.
- Transport schemes may potentially increase the speed of economic decline. There hasn't been a proper evaluation but anecdotal evidence suggests that the M55 to Blackpool could have led to increased day trips and fewer overnight stays at hotels and B&Bs.
- Proving the additionality of jobs at a national level is difficult. More evaluation evidence is needed, not just of benefits in a local area but disbenefits further away.
- More thinking is required about how changes in time savings migrate through to changes in the real economy – e.g. the jobs people have and where they work.

### **Transport improvement and induced investment**

- Do we have robust evidence that transport (along with other public investments) in an area signal that the government is committed to supporting a growing city? Transport Scotland are thinking about this issue.
- It's important to talk to big institutional investors in London & those investing outside London to gather their views on transport bottlenecks.
- It is very hard to value regeneration impacts from high speed rail, in particular there is no evidence from developers and the private sector on how they will respond to such interventions.
- What evidence do we have that transport investments change local people's expectations in deprived hinterlands such as Blackpool, Rochdale and Birkenhead?
- Evidence from large cities that around stations railway arches can have an incubator effect and investment in rail infrastructure supports businesses in close proximity to stations.
- Need for more, longer and wider evaluations of schemes with economic growth objectives. Argued that 5 years is nothing like long enough to see land use change and that there can be ripple effects in the wider economy that weren't intended when the scheme was proposed.
- Need to consider the impact of technology for location decisions – not just transport but also broadband connections.
- One theory postulated was that if transport investments change expectations and confidence in a local area, and this is reflected in property prices, this can help those at the bottom of the labour market. Rising property prices may give people more collateral to take out loans to build their own businesses.
- More micro research is needed on how firms actually use transport.
- More objectivity is needed on what is an unlocking scheme (e.g. small-scale dependent development).

- Need to improve the modelling of the links between transport interventions and transport-using sectors of the economy such as access to labour market, business (high skilled labour) travel and freight.

### **Necessary conditions for transformational change**

- It was asked whether presupposing transport investments have the potential to transform an area, whether it was possible to make a checklist of things that are necessary for a transport improvement to generate transformational impacts? Necessary conditions and logic maps could provide a structure distinct from and additional to quantitative modelling.
- A checklist should be embedded in the economic and strategic cases, and is something both DfT and MHCLG should consider.
- Necessary conditions include the commitment of local institutions, e.g., the willingness of LA to give planning consent, local governance structures, and the joined-up-ness of local authorities.
- Local authorities must work together effectively and this is one of the challenges with devolution and local development. Since the establishment of the London Mayor, the councils within London now work much more effectively for London as a whole – “the Bromley effect”.
- What evidence do we have on good governance i.e. are the necessary structures in place for LAs to work together within a region together with DfT, MHCLG and BEIS to deliver something?
- Green belt councils are resistant to development. How do you change incentives for planning authorities?
- Need for a credible commitment from local stakeholders to make the changes that will enable development e.g. developer contributions.
- Do we know what the necessary conditions are for local economic growth, and whether transport is a limiting factor?
- In development economics, aid agencies carry out a growth diagnostics study, should the same be done for the UK? What is on that list?
- The checklist should seek to identify whether there is a clear demand for an investment to take place, or whether the investment is intended to trigger new development. Is the planned transport investment leading or lagging?

### **UK institutional structure**

- In the UK we have an institutional gap at a national level; DfT funds transport and MHCLG funds regeneration but use different appraisal guidance. This is less of a challenge at a local level. How do other countries deal with this? Should they be harmonised?
- The UK is the only densely populated country in the rich world that doesn't have a national spatial planning framework. Scotland and London have frameworks, but approaches in the UK are generally very localised. A national framework means that you can have conversations on different levels in the same language.
- However, France has a national spatial planning framework but people at the local level spend their time trying to get around the national framework.

- Why does the UK evaluate increased land use density in one way but transport in another, if both create benefits through agglomeration?

## Part 2 - Appraisal: Techniques for predicting and valuing the impacts of transport improvement

### Presentations

3.16 Chris Campbell (DfT) outlined six elements of a good modelling approach:

- Proportionality - every model needs to be proportional – move away from adding in more impacts and commissioning expensive supplementary economic modelling just because a scheme has a low BCR but is assumed to surely have transformational impacts.
- Micro-foundations - need more evidence to reach a consensus on transmission mechanisms, when these impacts occur and how big a change in generalised travel costs is needed to generate such impacts.
- Transparency - every business case that passes through DfT is accompanied by an analytical assurance statement – do we have sufficient confidence in knowing what's going on in a model to give a supporting analytical assurance statement?
- Validation - can a model replicate what happened in the past? There is a real challenge from a lack of evidence here.
- Valuation - HMT insist we use national level CBA, how do we establish levels of displacement? A lot of stakeholders & Ministers are more interested in local GDP, how do we reconcile this with CBA? How do we also identify market failures?
- Priorities - evaluation evidence takes so many years to come through – need to be making progress elsewhere as we wait – reach agreement on proportionality (when should I undertake supplementary economic modelling) and reaching a consensus on theoretical micro foundations?

### Discussion

3.17 Discussion focussed around four issues:

#### Key modelling challenges

- A lot of strategic cases are now focused on rebalancing but the economic case tends to focus on journey times and capacity. One participant expressed the view that current tools (e.g. LUTI and SCGE modelling) are not fit for purpose to truly understand spatial impacts.
- Question of whether transport investment leads or follows economic growth. In London, it's often claimed that transport follows, making planning and modelling relatively easy. Whereas outside London it is much more difficult to model situations where transport aims to stimulate growth.
- Move wider impact modelling into a less promotional context – some participants noted that they would like to see an appraisal with negative WEIs
- Challenge of validating multiple change processes together, although possible for individual components/processes.
- We should consider packages of interventions and understand the impacts of the individual elements of said packages.



- Projects about links and networks. Need to think in terms of networks and evaluate programmes not just projects
- A key input to this modelling is planning decisions, it is very difficult to use local planning allocations to build up an accurate picture over 50 years.
- It was argued that the most challenging issue is land use change and ensuring the benefits for those in the centre from transport improvements spillover to those outside. Need to ensure compensation systems are in place and incentives are aligned - this can't be captured by current LUTI models.
- Need to establish what is additional and whether transport unlocks housing or whether it's the other way around (transport creating demand for housing).
- Need for a greater understanding of the interactions between local and national-level BCRs.
- Need to look at programme versus project assessment, particularly the trade-offs between modes and national versus devolved funding pots.

### **Processes for learning and improving standards**

- There must be much greater learning across projects when developing models for a new project. There is a role for Government in providing a critique/review of different models/applications.
- Advances in modelling tend to happen on a project by project basis but the learning is not shared for future projects. There is a tendency for advances to be seen as a way of advocating for a particular project. There need to be mechanisms in place to share knowledge for all future model developments.
- We don't all agree and don't have enough empirical evidence to base all modelling on empirical evidence. Therefore, we should develop an independent, agreed framework so modelling is not done very differently for all individual schemes, otherwise analysis becomes less valuable to decision-makers.
- External documented peer review and pushing for greater transparency are massively underrated as a way of driving up quality. People often do internal reviews but this doesn't provide anything like the degree of challenge of external review.
- Note that scheme promoters trying to build support have a completely different agenda to DfT and HMT, resulting in different models being developed to meet different customers' needs. Is there a better way for these models to incorporate these different priorities in a systematic way?
- These models are by their nature complicated and it is very difficult to get people to buy in to them even if they appear transparent and have been developed collaboratively.
- Need to build up an evolving library of evidence to support scheme promoters and modellers develop economic narratives.
- It was speculated if anything else could be learnt from looking again at the way transport appraisals are done in other countries?

### **Spatial level, granularity and displacement**

- Getting data at different levels of spatial granularity is hard. People tend to believe data at a high level of granularity too much although it is inherently less reliable.

- Challenges around modelling distributional effects and additionality/displacement. There is a trade-off between spatially detailed, locally-focused models for a scheme versus national-level models with a much coarser zone system. The former will give more detailed distributional analysis but won't show displacement effects.
- Would it be better to sometimes have theory with some numbers attached and simple models?
- Models should be grounded in theory. LUTI models, based on systems dynamics, need to fit with an overarching economic theory.
- Are there any questions where you just say "no, this model can't address..."?
- In terms of proportionality, there needs to be some linking to economic geography considerations to consider whether a model is required.
- Overly focused on agglomeration which is only one of many causes of economic growth. We didn't used to think of cities as engines of growth – now inconceivable to think of anything else. Need to think beyond agglomeration effects in appraisal and modelling.
- Models should be able to reconcile GDP and welfare measures of impacts.
- Key issue is identifying and reflecting uncertainties using an appropriate analytical approach. Uncertainties in inputs as well as methods. Crucial to allow sufficient time for sensitivity testing but often time is short.

### **Role of DfT**

- Modelling should be undertaken to assess a range of options early in the scheme development process. Scheme modelling is often too late and carried out after the scheme has already been planned in detail so is likely to go ahead anyway.
- Analytical frameworks should be used more at an early stage in the planning process to objectively compare different options even if there are more uncertainties.
- Need to review of modelling studies – what went well and what went not so well? Greater analysis of model results and what is driving the results?
- Support for DfT to provide a panel of external experts to do peer review of projects.
- DfT shouldn't make its own models but should provide guidance on for example what assumptions are right to use. DfT should give people building models certainty while also allowing them to innovate.
- Support the idea of modelling being used for long term planning. Often presented with a broad list of urban transport schemes that might work in different contexts but no evaluation evidence to inform decision making.
- Further support for models being used for long term planning of interventions and not just developing the same solution and same objectives for every city.
- Role for a central body to own and steer models but not the DfT as it advocates for some schemes so maybe an independent body such as NAO or NIC.



## 4. Supporting the application of WebTAG and making it more user friendly

### Background

- 4.1 This note provides a summary of the DfT Workshop sessions on WebTAG, which were held on 15 October 2018 and form part of the DfT's Appraisal and Modelling Strategy Consultation. Separate morning and afternoon workshops were held, with identical agendas but different attendees.
- 4.2 The attendees were as follows: David Christie (TfL), Manos Mavrogiorgis (DfT), Robin Cambery (DfT), Nila Sari (DfT), Chris Ward (DfT), Lewis Pagden (DfT), Paul Hoad(Highways England), William Bryans (Surrey CC), David Metz (UCL), Chris Robinson (SYSTRA), Faiz Nassiri (Sweco), Craig Drennan (WSP), Siamak Bardaran (TS Catapult), Tim Gent (Atkins), Dewei Kong (Atkins), Olga Feldman (Arcadis), Asia Williams (Cambridgeshire & Peterborough CA), Clare-Louise Douglas (Arcadis), Saumil Patel (Sweco), Neil Raha (Systra), Luciano Pana Tronca (Inner Circle Consulting), Paul Johnson (Liverpool City Region CA), Peter Davidson (Peter-Davidson), Sarah Harris (Mott MacDonald).
- 4.3 The theme of the workshop was 'Supporting the application of WebTAG and making it more user friendly'. The workshop followed on from the online user survey which DfT had also conducted.
- 4.4 This note summarises the workshop including attendance, key messages presented by DfT, structure of the workshop and a summary of the issues raised in the discussion. It has been written by Tim Gent (Atkins) and the issues raised in discussion do not necessarily reflect the views of DfT.

### Executive Summary

- 4.5 This workshop consisted of two separate sessions (morning and afternoon) with approximately 10-12 attendees in each session. The majority of the attendees were transport modellers, mainly within consultancies but also from major client organisations.
- 4.6 Results from the WebTAG user survey were first summarised (for more details see Chapter 6). Most respondents to this survey were also consultancy practitioners, with considerable experience in transport modelling or transport planning. Of the responses, approximately 1 in 5 raised issues with ease of use, flexibility or proportionality of WebTAG. There were common requests for more technical examples, clarity on WebTAG compliance, and more assistance to search and cross-reference within the guidance itself. In general, these are all conclusions which were later borne out by the workshop discussions.

- 4.7 Though the workshop was divided into four group discussions, there were several themes which recurred across these, and hence the workshop as a whole is best summarised using these.
- 4.8 There was general agreement about the positive impact of WebTAG, which is more accessible following the restructuring and consolidation in 2013, and often referenced outside the UK. However, it was frequently noted that the purpose of WebTAG is often unclear or poorly understood. This might be addressed by first ensuring that the purpose of modelling and appraisal is understood as an integral part of the planning process.
- 4.9 This lack of clarity may play some role in discussion about the flexibility, proportionality and interpretation of WebTAG, though the term proportionality certainly requires definition. The issue of interpretation and compliance was in turn linked to client understanding and appreciation. It is not clear how many clients are aware of, or have read, the Senior Responsible Officer guidance, and are able to apply the proportionate thinking required. Securing funding is too often seen as an over-riding objective without appreciating the wide role of modelling and appraisal in identifying gaps, sifting options and improving schemes.
- 4.10 There was also discussion of the WebTAG user community, and particularly how to facilitate communication and training. It was recognised that early career professionals need to be supported in understanding both the role of WebTAG and detailed guidance. Though even experienced practitioners rarely have detailed knowledge of more than one or two units, and need time and support to learn more or keep knowledge up to date.
- 4.11 Improvements to the accessibility, structure and presentation of WebTAG would help all types of users. Within WebTAG, more cross-referencing and search facilities would be a great help, whilst different types of summaries or guides for new users, experienced users and clients were also suggested. Despite some requests to make WebTAG simpler, practitioners felt that simplification should not be seen as an end in itself.
- 4.12 Throughout the sessions, as in the user survey, there were frequent requests for worked examples to demonstrate how guidance can be implemented and spread best practice. It was felt that this could aid understanding as well as clarifying issues of compliance and proportionality. For reasons of time and commercial constraints, practitioners would not be able to generate or share examples widely without specific client initiatives to do so. Setting aside time to develop material and creating a forum such as a 'WikiTAG' were suggested.
- 4.13 In terms of gaps, though WebTAG has driven innovation in modelling and appraisal, there is now a need to consider how new modes, changing travel trends and information technology should be considered. It was noted that research and development is needed in many areas, though initially the challenge is to give guidance on how these new areas fit within WebTAG rather than to give definitive instruction. Many other specific improvement points were also raised, which are listed in more detail below.
- 4.14 Overall, the workshop confirmed that WebTAG has a strong role in modelling and appraisal in the UK. Practitioners would appreciate more clarification of this role, and assistance with educating both themselves and clients in how to make the most of WebTAG.

## Format of workshop

- 4.15 Both the morning and afternoon sessions were chaired by David Christie (TfL, Demand Forecasting Manager), with introductory comments and facilitation by Robin Cambery (DfT, Chief Transport Modeller) and Nila Sari (DfT, Principal Transport Modeller).
- 4.16 Each session began with a brief outline of the DfT's Appraisal and Modelling Strategy Consultation, and the role of WebTAG by Robin Cambery, and a presentation on the WebTAG user survey results. These were followed by a general Q&A discussion to allow attendees to raise queries and make general points relating to WebTAG.
- 4.17 The attendees then took part in group discussions on themes, with two parallel discussions first on:
- Accessibility of WebTAG: how to make it easier for you to find the guidance you need? Any practical solution that the Department can implement to improve the accessibility and usability of the guidance?
  - Understanding and implementing the guidance: what would be needed to improve people's understanding of the guidance? How can the Department help users in implementing the guidance?
- 4.18 After feedback and discussion, there were further group discussions covering:
- Flexibility and proportionality in WebTAG application: how to ensure the appraisal and modelling work follows best practice but at the same time it stays flexible and encourages innovation? How can we achieve proportionality in the application of WebTAG?
  - Technical aspects, missing aspects, things to change and potential new topics: what aspects and/or topics are most important that are currently missing? Any aspects that are dated and needed to be changed?

## WebTAG User Survey results

### Introduction

- 4.19 Nila Sari presented an overview of the WebTAG User Survey (see Chapter 6 for more details). The aim of the survey was 'To help the Department identify ways to better support the use and application of the guidance'. The survey ran from 3rd September to 11th October 2018, and 90 completed responses were received.
- 4.20 The link to the online survey was sent via email to about 900 people who are in the WebTAG stakeholder contact list. This email with the link to the survey might have been forwarded and shared wider. It was also posted on LinkedIn.
- 4.21 The survey was not designed to seek statistically reliable answers, but it aims to gauge respondents' opinions and feelings, as well as allowing respondents to offer feedback in their own words.

### Summary of Survey results

- 4.22 Of those responding to the survey:
- The majority were working in consultancy (56%), followed by Local Authorities, with the remainder coming from Central Government (8%), and other local

transport bodies (5%). Only 2% of respondents were from academic or research bodies.

- Nearly three-quarters were practitioners or technical project managers, a further 12% were scheme promoters or senior responsible officers.
- 51% stated they were transport modellers, and 24% transport planners, with economists (10%) being the only other major category.
- 40% had 20+ years' experience, with only 9% having less than 5 years' experience.

4.23 Many responses relating to accessibility mentioned the need for better search facilities, links between sections and clearer updates. Another major theme was the need for simpler language and clearer descriptions.

4.24 63% of responses stated the guidance is 'somewhat easy' or 'very easy' to understand, with only 18% 'not so easy' and no responses saying the guidance is 'not at all easy' to understand. A common request was for technical examples to be provided, and for the difference between mandatory section and guidance to be made clear.

4.25 When asked if the guidance is easy to implement, 40% of respondents were neutral and 42% found it 'somewhat easy' or 'very easy'. 18% said the guidance is not easy to implement. There were a wide variety of specific suggestions to assist with implementation, though technical examples were regularly mentioned.

4.26 When asked about flexibility, the majority of respondents (78%) felt the guidance is flexible, at least 'to some extent'. However, 22% felt the guidance is hardly or not at all flexible. Similarly, most respondents (81%) felt that the guidance is proportional at least to 'some extent' and only 19% felt it was hardly or not at all proportional. However, several respondents asked for clarity about the term proportionality and relevant examples.

4.27 In conclusion, the responses suggest that WebTAG users are heavily drawn from consultancy, and are largely practicing modellers or transport planners. Many had been using WebTAG for more than 10 years. The majority of the respondents stated that the guidance is reasonably easy to use, flexible and proportional. However, approximately 1 in 5 consistently stated that the guidance is not easy to use and is inflexible / not proportional.

4.28 Given the slightly self-selecting nature of a 'user' survey, it is perhaps worth considering that the responses are more likely to be from more regular and experienced users, which may give some bias.

4.29 The most regular requests for changes related to search facilities, technical examples and clarification of compliance requirements.

## Summary of discussion

### Introduction

4.30 The detailed points raised in the discussion are listed in the Appendix to this document. This section summarises those discussions into 9 themes:

- Positive views of WebTAG
- Purpose of WebTAG

- Applications of WebTAG – flexibility, proportionality and interpretation
- Client understanding and appreciation of WebTAG
- The WebTAG User Community – communication and training
- Improving accessibility, structure and presentation
- Examples and best practice
- Developing future methods, encouraging research and innovation
- Gaps and specific improvements

### **Positives views of WebTAG**

- 4.31 Many of the attendees were in agreement that the existence of WebTAG has been, and continues to be, a major positive factor for modelling and appraisal. When the development of modelling and appraisal practice over the past few decades is considered, it is clear that the introduction of WebTAG has made a significant contribution.
- 4.32 This is often illustrated by noting that other countries (notably the Middle East, New Zealand and Australia) look to WebTAG for guidance also. It was noted however that countries without guidance still develop transport schemes successfully, and particularly in Europe and the US we should not conclude that their practice is behind ours.
- 4.33 The previous restructuring and consolidation of the guidance in 2013 was praised as having improved the accessibility and readability a great deal.

### **Purpose of WebTAG**

- 4.34 There was extensive discussion, either directly or indirectly, regarding the purpose of WebTAG. There were several sub-themes to this as follows:
- First and most critical, was the issue of whether WebTAG is actually understood to be guidance, or (at least in effect, if not by design) treated as a prescriptive checklist for scheme approval. There were mixed views on this: some attendees felt that they are able to use judgement and justify variations around WebTAG, whilst others felt particular client pressure to 'just make it WebTAG compliant'.
  - The role of the Department for Transport was also mentioned, with the implicit assumption that DfT 'own' WebTAG, and are therefore in some sense responsible for the development of modelling principles and practice.
  - There was discussion of some wider points relating to the purpose of modelling and appraisal which are also relevant here. Many clients explicitly see the process as one of gaining approval for a scheme. However, many present agreed that in fact the modelling process can (and often does) make major contributions to identifying gaps, sifting schemes and very importantly both improving scheme design, and eliminating schemes with no overall benefit.
  - It was noted that where read thoroughly, the current WebTAG does provide a steer on most of the points above. However, the conclusion from the discussion must be that there is still a lack of clarity in the wider community, either because the guidance is insufficiently clear, not thoroughly read/understood, or other constraints are getting in the way.

### **Flexibility, proportionality, interpretation**

- 4.35 A specific theme of the workshop was to consider the flexibility and proportionality in the application of the guidance. Relevant points were made throughout the workshop, though proportionality itself was seldom raised, and it was noted that that the concept of proportionality is in itself not well understood.
- 4.36 Comments most often revolved around the confusion already mentioned about the emphasis clients place (perhaps wrongly) on 'compliance' with WebTAG. Practitioners are aware that certain criteria need to be met in order to provide a robust model, or to support a business case. There are clearly differing views, perhaps subjective, about which parts of the guidance are 'mandatory' and in what circumstances.
- 4.37 Some practitioners find checklists and specific instructions for model building helpful, whilst others feel that this stifles innovation, and that the process should be more bespoke and fluid.
- 4.38 It was noted that any model building often has to consider the aspects of guidance which will ultimately apply for a major business case, even if initially that is not the purpose of the model.
- 4.39 Attendees suggested that this area could be clarified either with more high-level guidance, or specific sign-posting to identify aspects which were compulsory in specific cases. More explanation of the rationale behind specific criteria would also assist in applying guidance proportionally.

### **Client understanding and appreciation of WebTAG**

- 4.40 The discussions frequently mentioned the need for clients to have an appreciation of WebTAG and understanding of its purpose. It should be clarified that this applied to many types of 'client', including direct commissioners of work, project sponsors, other senior clients and planning inspectors. It was clear that there is a wide range of 'client side' roles which need to be considered.
- 4.41 The existence of the current 'Senior Responsible Officer' guidance was noted, though it was perhaps evident that many practitioners are not very aware of the content, and moreover do not know if their clients are aware of this.
- 4.42 A major theme for clients was the emphasis they place on 'compliance' and meeting WebTAG 'acceptance criteria'. It was felt that clients often over-emphasise compliance against specific criteria (the ones they have most awareness of), which drives behaviours discussed in 0 above.
- 4.43 It was suggested that a 'glossy' overview brochure for the client side may help, as well as specific training and communication, and a client checklist. The PTRC course 'modelling for non-modellers' might be worth reviewing in this context.

### **WebTAG User Community – communication and training**

- 4.44 The needs of the WebTAG users was raised several times, often in the context of new users or early career professionals. It was felt that more could be done to introduce WebTAG to these people, and suggested methods included specific training courses or an introductory guide targeted specifically at them.
- 4.45 However, the needs for awareness and involvement from a wider community of users went further than this. Attendees mentioned the difficulty of 'keeping up to date' with WebTAG and promoting discussion both within and between organisations. It was suggested that a 'WebTAG conference' or other regular forum could promote discussion of the guidance.

- 4.46 It was clear from comments – and not seen as surprising – that very few practitioners have a working knowledge of more than a few units, and frequently no real awareness of the full scope of WebTAG. Users tend to specialise in specific units, reinforcing the need for an overview to understand what else is covered and where connections need to be made.
- 4.47 There was also some indication that practitioners are struggling commercially to invest in time to read and engage with WebTAG, and therefore ways to either fund activities or keep costs low need to be considered.

### **Improving accessibility, structure and presentation**

- 4.48 There were some common comments on the structure and presentation of the guidance with some obvious themes. Several attendees felt that there should be an increased emphasis on high level guidance and summaries. These would serve both to act as an introduction and guide to new users, and very importantly to encourage clients, scheme sponsors or other non-technical staff to gain a better appreciation.
- 4.49 It was felt that the latter needs to cover both the purpose and process of modelling, and in format might be ‘glossy brochures’ or in the form of regular presentations, webinars or training.
- 4.50 Several attendees felt that there should not be any attempt to ‘dumb down’ or simplify core guidance as “you can’t make the something inherently complex simple”. Users of guidance should instead be aided in gaining understanding, partly through the high-level guidance giving more information on the purpose and basic principles
- 4.51 Other suggestions to improve accessibility included the introduction of checklists, an index, a search facility and use of keywords.
- 4.52 The need to communicate changes effectively was also discussed. Through consultations are launched, and new guidance is produced as draft, it can nevertheless be hard to keep track, identify and absorb changes.

### **Examples and Best Practice**

- 4.53 The need for the user community to have access to best practice and other examples was raised repeatedly. It was felt that examples of the application of guidance are hard to access. Though it was noted that there are undoubtedly many good quality reports on specific applications, they are not widely or easily available, or organised in a way that is easy to identify.
- 4.54 There were clear benefits it was felt to having worked examples available, promoting the best practice as well as standard methods of applying WebTAG.
- 4.55 Some specific suggestions were made in this context, notably that WebTAG units should have sections which emphasise minimum requirements, followed by examples of implementation.
- 4.56 A ‘WikiTAG’ was also suggested as a separate online facility for user-created and curated content explaining both the background to WebTAG, and worked examples.
- 4.57 It was noted that practitioners seldom have time or budget to develop this kind of material, and there is little client funding or motivation to do so. Indeed, there are some issues related to competitiveness.
- 4.58 One suggestion raised was that practitioners need ‘sabbaticals’ to review and develop material of this kind, and that this could raise the general level of community interaction.



### **Future methods, encouraging innovation and research**

- 4.59 Though the issue of innovation arose in relation to compliance and proportionality (discussed above), it was also frequently raised independently in relation to the need for research and development of methods.
- 4.60 It was noted that WebTAG itself has actually driven innovation in many areas, in its original form in encouraging the introduction of variable demand modelling, and latterly by incorporating new elements into appraisal.
- 4.61 Attendees noted that new modes of transport, changing travel trends and information technology need to be considered. Electric vehicles, mobility as a service and CAVs (connected and autonomous vehicles) were mentioned as requiring new aspects to be considered such as charging points and the value of shared mobility. There is a need for WebTAG to actively consider how these future issues should (or should not) be incorporated in modelling and appraisal.
- 4.62 The need for research to be stimulated and feed into the guidance was raised, both in relation to continuous innovation/improvement of practice, and larger research initiatives which need active funding.

### **Gaps in WebTAG, specific improvements**

- 4.63 Throughout the sessions, attendees identified specific topics or aspects which should be added or improved. This section lists these with some comments on unifying themes.
- 4.64 Specific gaps mentioned were guidance on:
- Use of new data, e.g. mobile phone data;
  - DIADEM;
  - Converting between Production-Attraction and Origin-Destination matrices, and particularly vice versa;
  - Matrix building (Note: a project to develop this is underway);
  - Development of sustainably-oriented schemes (e.g. active modes) and their assessment;
  - Governance of transport schemes;
  - Aggregation of schemes to assess their joint economic benefit, programmatic appraisal;
  - Weekend effects, particularly induced traffic;
  - Assessment of land value uplift;
  - Implementation of MaaS, CAVs etc;
  - Changing travel trends – e.g. assumptions on young peoples' behaviour, varying trip rates between segments and over time;
  - Guidance on databook values to support air quality and noise assessments;
  - Assessment of journey quality;
  - Application of large models for local area schemes, air quality etc. Appropriateness and methods to use;
  - Guidance on scenario-based planning.

4.65 Areas where existing guidance was felt to need review or expansion:

- The '6-year rule' for use of count data. What is the basis for this rule, and does it always apply?
- Cost-pivot models vs absolute models applied incrementally. It was suggested the guidance leans towards the former, though this should be reviewed;
- More explicit linkage to the '5 business case' model;
- Consistent and complete use of indices in equations, particularly Unit A2;
- Impact of model coverage on agglomeration benefits;
- Clarity of definition of high and low growth scenarios (Unit M4).

## 5. Modelling and appraisal tools that meet user needs

### Executive Summary

- 5.1 This document aims to present the key areas of discussion from the transport appraisal and modelling strategy workshop on the Department for Transport's (DfT) consultation, focused on developing and maintaining modelling and appraisal tools, held at Mott MacDonald's offices in Birmingham on 14 September 2018. This chapter has been written by Tom van Vuren (Mott MacDonald) and does not necessarily reflect the views of DfT.
- 5.2 There were two key themes emerging from the sessions. These recurrent remarks were as follows:
- For the DfT to take more ownership in facilitating collaboration with other sectors and stakeholders to enable practitioners to better answer the questions being asked of them.
  - A desire for more case studies and examples of good practice to be provided by the DfT. It is hoped this would:
    - improve how both clients and practitioners interpret guidance.
    - address current misconceptions regarding compliance and proportionality.
    - encourage greater amounts of innovation to occur whilst adhering to the guidance.
- 5.3 Of these themes, described above, participants were most partial to having more feedback from the DfT. Particularly, if feedback was provided highlighting examples of both 'good' and 'bad' practice with regards to how proportionality had been applied or where an approach had been taken which was not strictly WebTAG compliant. There was a willingness amongst participants, particularly practitioners, to help facilitate this through offering their own contact details as part of a best practice repository. This highlighted the extent to which participants wished to see such a platform implemented and how attitudes to collaboration and knowledge sharing between those in the private sector has changed over recent years.
- 5.4 Participants also reached a consensus that they need more guidance and assistance from the DfT in addressing challenges and uncertainty that face practitioners both now and in the future. Participants were keen to stress that it is difficult to tackle such issues without DfT intervention either through: collating research from across and outside the sector and/or altering its guidance to better reflect the challenges faced by the industry currently.

## Format of Workshop

- 5.5 The workshop was convened by Tom Van Vuren of Mott MacDonald and held in Mott MacDonald's Birmingham office on Friday September 14th, 2018. The attendees invited were from a range of backgrounds including guidance providers, practitioners, software developers, data providers and members of public bodies.
- 5.6 The attendees were as follows: Nik Bowyer (AECOM), Pete Sykes (Aimsun Ltd), Neil McCormack (Arup), Ashish Chadha (Atkins), Oliver Charlesworth (Citilabs), Phillipe Perret (CitiLogik), Robin Cambery (Department for Transport), Nila Sari (Department for Transport), Graham Powell (Highways England), Joe Payne (Highways England), Phillip Clarke (Jacobs), Harvey Tims (Mott MacDonald), Tom Van Vuren (Mott MacDonald), Gareth Evans (National Assembly for Wales), Chris Davis (PTV), Neil Chadwick (Steer), Pete Kidd (SYSTRA), Ian Palmer (Transport for Greater Manchester), Mark Honey (Transport for London), Helen Ursell (Transport for West Midlands) and Firuz Sulaimi (WSP)
- 5.7 The format of each session was as follows:
- To split the attendees into 2 predefined groups to discuss an issue, documenting key points.
  - A designated chairman/speaker from each group would provide all attendees with a short summary of what was discussed, focussing on a select subset of key topics leading to 3-5 actions for the Department.
  - A final discussion between all attendees of what was presented throughout the session.
  - The groups and elected chairs/speakers were selected prior to the event by the event organisers. Furthermore, the choice of chair/speaker in each case was intended to reflect the topic being discussed and to give a platform to participants from each of the backgrounds in attendance.
- 5.8 Given the intended format of the workshop, the questions, were disaggregated and altered to create three key topics for discussion. The topics of discussion chosen were as follows:
- Highlighting immediate areas of focus
  - Exploring future modelling challenges
  - Practical implementation, proportionality and innovation
- 5.9 Finally, attendees acknowledged that not all ideas presented during each group's discussion could be presented during the summary session that followed. Therefore, attendees were encouraged to write down any additional ideas so that they would not go undocumented and could be collated following the close of the event.

## Highlighting immediate areas of focus

- 5.10 The aim of the first discussion was to better understand which areas of modelling and appraisal could be improved upon immediately. Attendees thus assessed the current state of modelling and appraisal whilst highlighting which areas were in greatest need of attention. In addition to considering the present-day, participants considered what challenges the industry may face in the short-term future and evaluate whether they felt they have the necessary tools and guidance to tackle such challenges.

- 5.11 The discussion highlights have been broken down into three sections: commenting on possible changes or improvements to research, guidance; and, data.

### **Practical improvements**

- 5.12 An area of research highlighted from the first discussion was to look at how existing and future transport models can be effectively used for environmental appraisal. Practitioners stated that there often appears a disconnect between the intended purpose of a transport model and how it is ultimately used, particularly by those outside the profession. Despite this, practitioners generally agree that the transport models used today are suitable for providing outputs for use in environmental appraisal. There is, however, an appreciation that models may not always be able to produce the required or expected outputs immediately, given differences in the level of granularity needed for environmental analysis. Thus, it was proposed that the DfT should:

- facilitate communication between environmental stakeholders and model developers such that there is a better understanding from both as to what can or cannot be expected regards environmental analysis.
- specify a commonly agreed environmental checklist that model developers must adhere to when developing models that will be used for environmental analysis.
- commission further exploratory research into how current transport modelling platforms could be used for environmental appraisal.

### **Possible Improvements to Existing WebTAG Guidance**

- 5.13 An area suggested where guidance could improve was the Appraisal Specification Report (ASR). It was suggested that often ASRs are written with too little care as to how the project team intends to deliver the modelling and appraisal outlined. Ultimately, this is believed to cause issues with proportionality, leading to the development of computationally slow and financially expensive models, which are lamented by clients and other stakeholders. Participants also seek greater clarity as to what the DfT, or other similar bodies, deem a 'good' or a 'good enough' ASR as such feedback would help them improve the quality of future submissions<sup>5</sup>. Attendees proposed that the DfT could:
- 5.14 assist in providing a repository of 'good' practice and case studies, complete with contact details of the authors and practitioners responsible.
- 5.15 reinforce the need for a ASR, or similar document as a means of formally agreeing an approach on proportionality between practitioners and other stakeholders.
- 5.16 Delegates also suggested the use of an ASR could be extended to include agreements over model detail in addition to providing commentary on the strengths and limitations of the modelling approaches used. Overall the majority of participants supported the DfT having a repository of ASRs. Finally, it was hoped that adopting a more robust approach to ASRs could address issues such as the disconnect between model developers and environmental stakeholders.
- 5.17 One delegate asked whether WebTAG is too scheme centric, focussing predominantly on mechanised modes; rather than simply the movement of people. Moreover, the delegate questioned whether current tools and guidance overly focuses on the business case rather than considering their use in the development of strategy and ultimate design. Participants mooted whether this focus was being mirrored in the models either in development or use currently as many concern the

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<sup>5</sup> Other similar documents

representation of roads policies or public transport supply projects. Subsequently, delegates asked whether we as an industry give too little attention to modelling and appraising new and active modes. To resolve this, participants suggested the DfT should:

- reconsider the focus of the guidance such that it better considers the movement of people irrelevant of mode.
- better align WebTAG with other available guidance such as the Passenger Demand Forecasting Handbook, PDFH.

### Transparency and Accessibility of Existing Datasets

- 5.18 Participants believe that there is benefit to be gained from having enhanced access to DfT developed datasets and models, particularly the National Trip End Model (NTEM) and National Freight Model. There was the observation that improved access and greater transparency to the methods used in developing such models may aid practitioners in better understanding how future trends in freight demand and housing data are derived. This observation stems from a belief that there is significant uncertainty in correctly capturing freight behaviour within existing transport models, both in terms of base year travel patterns and in terms of our ability to reflect future changes (be they exogenous and/or policy-driven). Delegates suggested this is the result of outdated datasets and a lack of research into the freight, particularly LGVs, and logistics field<sup>6</sup>. Participants believed this to be of significance given that improvements to freight often amounts to a substantial amount of benefits within highway scheme appraisals; and their importance in environmental terms.
- 5.19 Finally, it was remarked that the DfT should seek to better incorporate its own software tools, such as TUBA and WITA, as part of existing commercial software platforms. It was believed that doing so would create more holistic modelling software platforms whilst also allowing functionality, such as TUBA's diagnostics, to be exploited at earlier stages within the model development process.

### Exploring future modelling challenges.

- 5.20 The second discussion stemmed from the first. However, the focus shifted to consider the perceived challenges modelling and appraisal will face in the long term. Participants were asked to consider hypotheses of what challenges the industry may face in the future, as well as highlighting areas of uncertainty they believe needs greater attention in the tools and guidance provided by DfT.
- 5.21 Again, the discussion highlights have been broken down into sections: capturing future behaviours using modelling tools and preparing for future datasets and uncertainty.

### Capturing future behaviours using modelling tools

- 5.22 Discussion during this workshop sessions regarded how to better understand travel behaviour, not only in the future but also the present day. This discussion revolved around three questions:

#### **Are practitioners able to explain changing travel behaviours?**

- 5.23 Delegates asked whether academic research into changing travel behaviour taking place within, or even outside, the sector is sufficiently visible, let alone used within

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<sup>6</sup> Research topics suggested phenomena such as the 'last mile problem'



current modelling and appraisal methodologies. Participants mooted whether the DfT should make a greater effort in collating and undertaking research into lesser known phenomena, such as the stability and transferability of behavioural parameters over time. Delegates suggested that greater awareness of relevant research would only aid practitioners in how they address this challenge going forward.

### **If so, are we capable of modelling it using existing software platforms?**

- 5.24 Despite the presence of software developers, there was little discussion as to how existing software packages could or are being adapted to better capture changes in travel behaviour, for example Activity-Based or Agent-Based Models. It was appreciated that software developers will wish to better understand uncertainty within the policy space before committing to specific improvements. Therefore, it is recommended that the DfT maintain dialogue with developers and consider how they can be encouraged to support changing requirements in WebTAG.

### **And, can we appraise it?**

- 5.25 There were concerns amongst attendees that the ability or inclination to work whilst travelling challenges the existing appraisal methodology that relies heavily on the valuation of travel time savings.

### **Preparing for Future Datasets and Uncertainty**

- 5.26 To better capture uncertainty both today and in the future, a suggestion was made as to whether existing model structures are too rigid. Delegates questioned whether models should be flexible and adapt to best reflect the datasets available. This prompted whether flexibility can be introduced using existing datasets or if existing data should be re-interpreted using alternative assumptions and methodologies. It was noted that new data sources are not being used to derive new behavioural insights or to prompt new model approaches; but that their use instead is constrained to providing inputs into existing modelling paradigms. However, there was a belief amongst delegates that should a more innovative approach be undertaken by practitioners, DfT guidance would also need to adapt to ensure that the models produced could still be assured with the same level of confidence as before and that the methods employed are ultimately transparent.
- 5.27 Many participants believed that most uncertainty within travel demand forecasting resides at a policy level. Therefore, it was asked whether there needs to be additional guidance from the DfT which can help practitioners reduce or mitigate this policy uncertainty.
- 5.28 This notion was supported by many, who perceive scenario planning as an essential aspect of modelling and appraisal. Although there were doubts as to whether practitioners and the DfT have sufficient influence to implement this in reality. Nonetheless, there was general agreement that additional support in how practitioners select and develop an 'appropriate' set of scenarios would be welcomed and strengthen both the applicability and consistency in application. Participants again felt that better documentation and/or a well-structured repository, highlighting examples of good practice, could aid practitioners greatly in this regard.

### **Practical implementation, proportionality and innovation**

- 5.29 The final discussion asked participants to identify what the perceived barriers are to implementing the changes discussed above. Furthermore, participants were invited to discuss whether they felt that the DfT and its current guidance inhibited innovation



within transport modelling and whether responsibility for improved methods lies with the Department or with the private sector.

- 5.30 The highlights of the final discussion have been split into two sections: better understanding compliance and the purpose of the current guidance and encouraging innovation whilst ensuring best practice.

### **Better understanding compliance and the purpose of the guidance**

- 5.31 The overwhelming consensus reached during this discussion concerned defining and understanding compliance and proportionality. It was remarked that clients need to better acknowledge that WebTAG by its very definition is guidance, as it was implied that clients too often value WebTAG compliance above all else. To assist with this, it was proposed that the DfT better communicate how the guidance has previously been interpreted to produce a successful funding bid, particularly in cases where the approach taken is not deemed 'classically compliant'. An example would be application of a tiered modelling structure. Moreover, practitioners felt that they would benefit from there being a frequently asked questions (FAQ) section within the guidance which would again help in promoting awareness of where the guidance or proportionality had been well applied
- 5.32 Furthermore, the DfT was encouraged to better engage with clients and stakeholders through workshops or targeted materials explaining the purpose of WebTAG and how innovation can be facilitated whilst still adhering to its guidance. An alternative suggestion was that the DfT could develop a Modelling and Appraisal Toolkit, similar to the one developed by Atkins for Highways England, which WebTAG users can interface with to understand which areas of the guidance are applicable in specific cases. Participants felt that this may assist non-practitioners, particularly within design and environmental teams, in understanding how and when specific model outputs can and should be used and the limitations in doing so.

### **Encouraging innovation whilst ensuring best practice**

- 5.33 Overall participants largely rejected the notion that WebTAG guidance stifles innovation. However, one area where practitioners felt WebTAG guidance did inhibit innovation was with regards to commercial software products. A possible resolution proposed was for the DfT to provide more feedback to software developers such that they are considerate of which areas innovation is sought, thus enabling practitioners to undertake innovation utilising such platforms. A simplistic suggestion as to how the DfT could better facilitate innovation was to relax some of the performance criteria defined within WebTAG. Participants felt that doing so would lessen clients' concerns over select model metrics and encourage them to better interpret WebTAG guidance. Furthermore, questions were raised as to whether some of these criteria should be revisited on the basis of practical experience in both achieving them, and their contribution to robustness in practice?
- 5.34 Many attendees were keen to see the DfT embrace new techniques, possibly being applied in other sectors, which may help foster a culture of innovation within the Transport Modelling profession. It was stated that the DfT could do better in encouraging innovation through:
- organising and/or sponsoring forums and practical sessions
  - the use crowdsourcing platforms or hackathons to research ideas.
  - sponsoring PhD programmes.

- seconding DfT staff to gain an understanding of the difficulties faced in application of the guidance

5.35 However, it was widely understood that adopting such suggestions would need active management on the DfT's part and thus be unfeasible without sufficient investment. Finally, although many attendees were keen to encourage innovation, it was widely accepted that resource challenges present in both the public and private sectors ultimately may constrain the amount of innovation undertaken. Therefore, accounting for this, questions were raised over whether the DfT should contribute more in assisting the private sectors in recruiting under and postgraduates, as there was a desire amongst many to better promote the sector as attractive to prospective talent.

## 6. WebTAG User Survey Results

### Purpose of the Survey

- A.1 The WebTAG User survey aim to seek users' views on the use of WebTAG, which will help the Department identify ways to better support the use and application of the guidance. The findings from this survey have also assisted the Department to form an agenda for the themed-based workshop to discuss the accessibility of WebTAG and help focus the discussion.
- A.2 The survey was launched on 3 September 2018 and closed on 11 October 2018, followed by the workshop on 15 October 2018.
- A.3 From the survey we would like to investigate options to streamline and simplify the guidance to make it more user friendly and accessible while maintaining its robustness. This survey was in addition to the formal consultation that took place between June and October 2018.

### Survey Design

- A.4 The survey used a questionnaire, which was designed to be short, quick and easy to complete. It mainly contained a combination of likert scales and open-ended questions. Past questionnaires or past data analysis were not available to inform the questionnaire design.
- A.5 The survey was not designed to seek statistically reliable answers, but it aim to gauge respondents' opinions and feelings, as well as allowing respondents to offer feedback in their own words.
- A.6 The survey used an online survey platform Smart Survey. A formal pilot survey was not carried out, but a few tests were carried out to check and refine the questionnaire.
- A.7 It was estimated that the survey would take 15 minutes to complete, but the records from the survey platform showed that it took on average 25 minutes to complete.

## Sampling

- A.8 The intended population for this survey was WebTAG users in the country. Within the available timescale and proportionate to the purpose of this survey, it was not possible to include sufficiently large sample taken from the whole population. Furthermore, the exact number of this population is currently unknown.
- A.9 Transport Appraisal and Strategic Modelling (TASM) division at the DfT holds a contact list of transport practitioners in the country, which include WebTAG users. An email was sent to about 900 people with valid email addresses. Please note that not all of these people are familiar with or experienced in using WebTAG.
- A.10 In addition, the link to the survey was posted on professional media site LinkedIn.

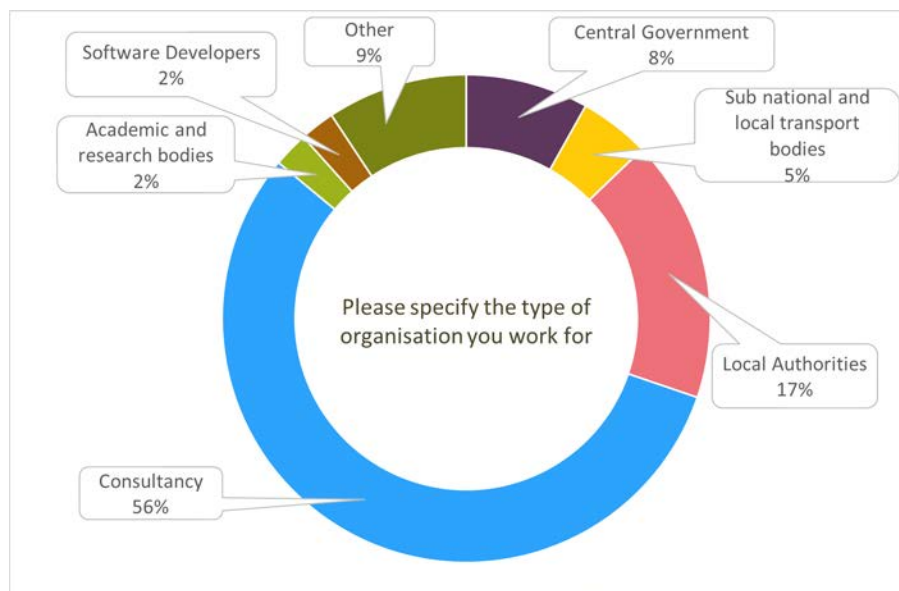
## Survey Results

- A.11 By 11 October 2018, 90 completed responses were received.

## Respondents Profile

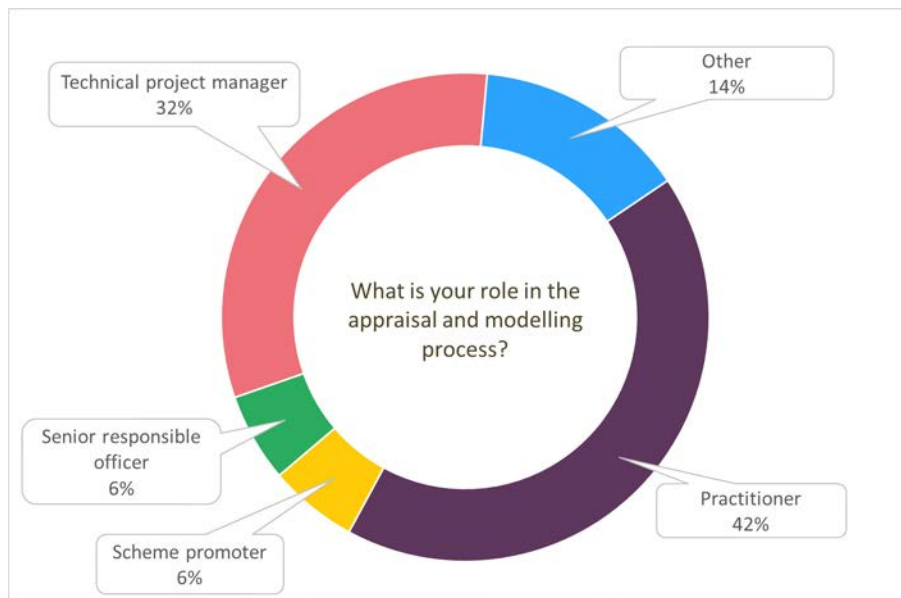
- A.12 Most respondents (56%) are from consultancy with Central Government, Local Authorities and Transport Bodies make up for 30% of respondents. Figure 1 shows the breakdown of organisations that respondents work for. 'Other' respondents are from software developers, Trade Association, non-government organisation, National Air Traffic Services and infrastructure operator.

**Figure 1 Respondent's organisation**



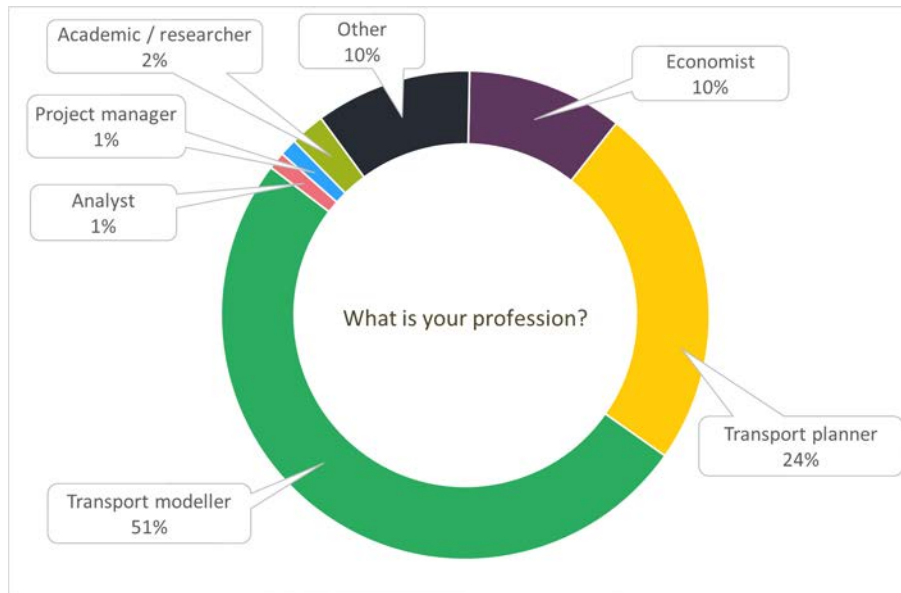
- A.13 Seventy-four per cent of respondents are either practitioners or technical project manager in the appraisal and modelling process. Figure 2 shows respondents' roles. 'Other' roles consist of academic critic, data supplier, appraisal support, analyst/planner, and reviewer.

**Figure 2 Respondent's role in Appraisal and Modelling**



A.14 Three quarter of respondents are Transport Modeller or Transport Planner. Figure 3 shows the proportions of respondent's profession. Ten per cent are Economists and environmental and policy, landscape architect, data analytics, and airspace specialist make up 'Other' professions (10%).

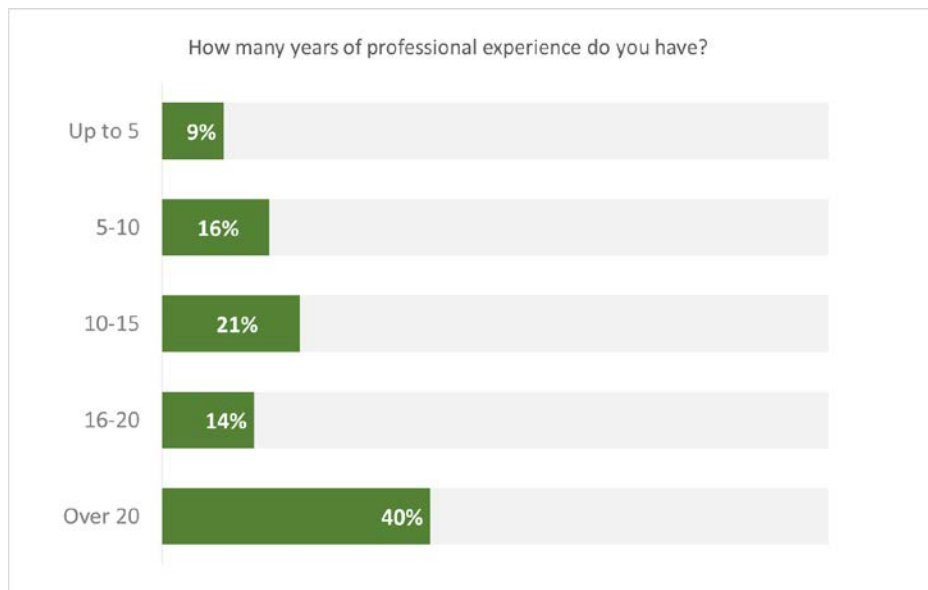
**Figure 3 Respondent's profession**



A.15 Most respondents (75%) have more than 10 years of professional experience.

A.16 Figure 4 shows this information.

**Figure 4 Number of years of professional experience**



## Accessibility of Guidance

- A.17 Most respondents (72%) think it is 'very easy' or 'somewhat easy' to find the guidance they need on the Department's website (i.e. GOV.UK), whilst 17% still think it is 'not so easy' or 'not at all easy' and 11% think it is neither easy nor not easy.
- A.18 Some respondents provided useful comments related to easy access to the guidance. Examples of suggested features that would help them find relevant guidance are:
- Clearer structure of the whole document at the beginning
  - Clear links or hyperlink to different section
  - Simpler language
  - Not too long nor too detailed
  - Search facility
  - Shorter webpage description
  - More interactive approach, as PDF is getting outdated
  - Clearer information on changes/updates to guidance

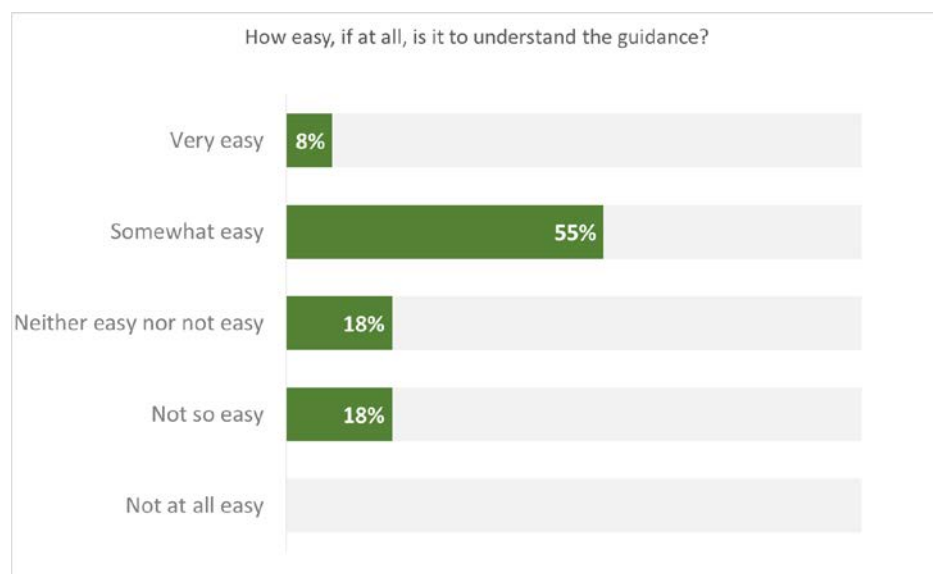
## Understanding of Guidance

- A.19 There are 18% of respondents that found it is 'not so easy' to understand the guidance, but 64% found the guidance is 'very easy' or 'somewhat easy' to understand with the remaining 18% are neutral. Figure 5 shows the respondents' opinions.

A.20 The strongest message is that some practical examples or examples of good practice are needed to help them interpret and use the guidance. They also suggested a differentiation between what is mandatory and what is guidance.

A.21 Some respondents recognised that appraisal and modelling process is complex and challenging, with “the brightest people take years to understand”. Therefore, it is not always easy to understand and apply the guidance. Some simplification and “plain English” would be preferred.

**Figure 5 Understanding of Guidance**



A.22 The guidance itself may be “alright” but people’s understanding of it needs to be improved. Other messages are:

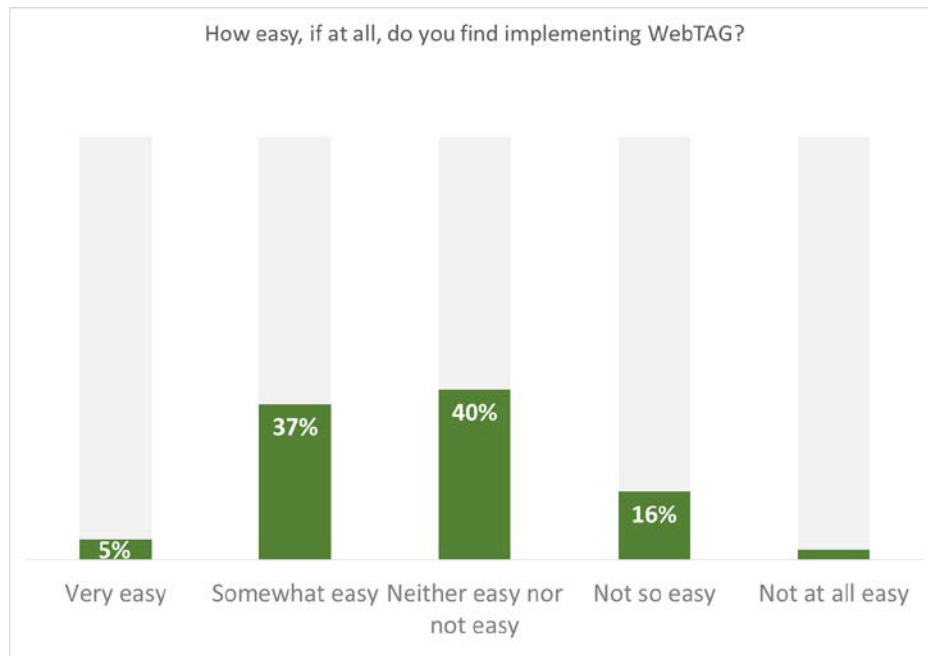
- Implementing short-cuts or cost-savings could be “dangerous”
- It is hard to follow multiple sections and subsections
- A process workflow and a step by step guidance approach would be helpful
- Consistency across units is required
- More references and access to supporting evidence and other materials, e.g. for justification of validation criteria and in-depth technical guidance



## WebTAG Implementation

A.23 Figure 6 shows the respondents' opinions on the ease of implementing WebTAG.

**Figure 6 WebTAG Implementation**



A.24 The aim of WebTAG is to ensure evidence-based appraisal and analysis are in place to support the development of business cases and investment decisions. Forty percent of respondents are 'undecided' about whether it is easy to implement WebTAG, whilst 42% find it 'very easy' or 'somewhat easy' to implement WebTAG.

A.25 Again, respondents seem to strongly suggest the provision of practical, real life and good practice examples to help them implement WebTAG would be required. They would also like to have access to evidence underpinning WebTAG requirements.

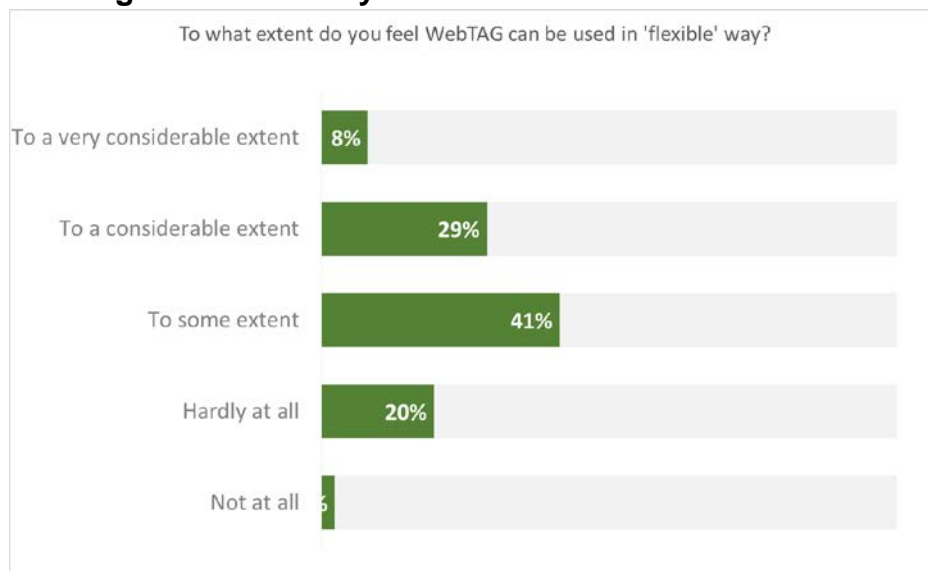
A.26 Other suggestions are:

- New tools, e.g. matrix build, calibration/validation, data verification
- Clients' expectation
- Difficulty is related to other parties, e.g. clients, sponsors, developers, etc
- Clarity of information and clearer guidance is required, e.g. "Unit M4 is open to interpretation"
- Some sections are complicated, e.g. Unit A2.2
- Provide a check list of requirements and a progress gateway
- "One size fits all" approach is not easy to apply
- Currently there is lack of ways to analyse and make suggestions
- Provide a template document with key sections for reporting
- Differentiate requirements for different project sizes, e.g. smaller projects with simpler methods
- No obsession with "WebTAG compliance"

## Flexibility of WebTAG

A.27 WebTAG is intended to be guidance that is non-prescriptive and helps prepare outputs needed for appraisal in a flexible way without stifling innovation. Most (78%) respondents feel that WebTAG is non-prescriptive and flexible at least to some extent. Twenty-two per cent of respondents feel that WebTAG is 'hardly' or 'not at all' flexible as shown in Figure 7.

**Figure 7 Flexibility of WebTAG**



A.28 The same strong message appeared again regarding the need for some illustration and worked examples. The other main message that keeps repeating is the need to change people's perception and improve understanding of the guidance, in particular for decision makers and officials in the planning process, as they currently follow "WebTAG compliance" and have the view of WebTAG as "absolute" and "rigid", which leads to the inflexibility of the guidance. Some education or training may be required, as cultural change and change of view are needed.

A.29 Other opinions regarding flexibility in implementing the guidance are as follows:

- Guidance for smaller schemes needs to be less onerous
- Clearer information and explanation on validation criteria and avoid "pass/fail" view
- It often becomes too prescriptive. The guidance currently sets out a lot of requirements that must be adhered to, e.g. Unit A2.1 includes the word 'should' 150 times
- "There isn't enough guidance for public transport"
- It needs more info about appraisal that does not focus on monetised benefits of journey time reductions
- Clear explanation of wider evidential data
- Encourage innovation
- Clear message between "guidance" and "mandatory"
- A great deal of experience and knowledge are required

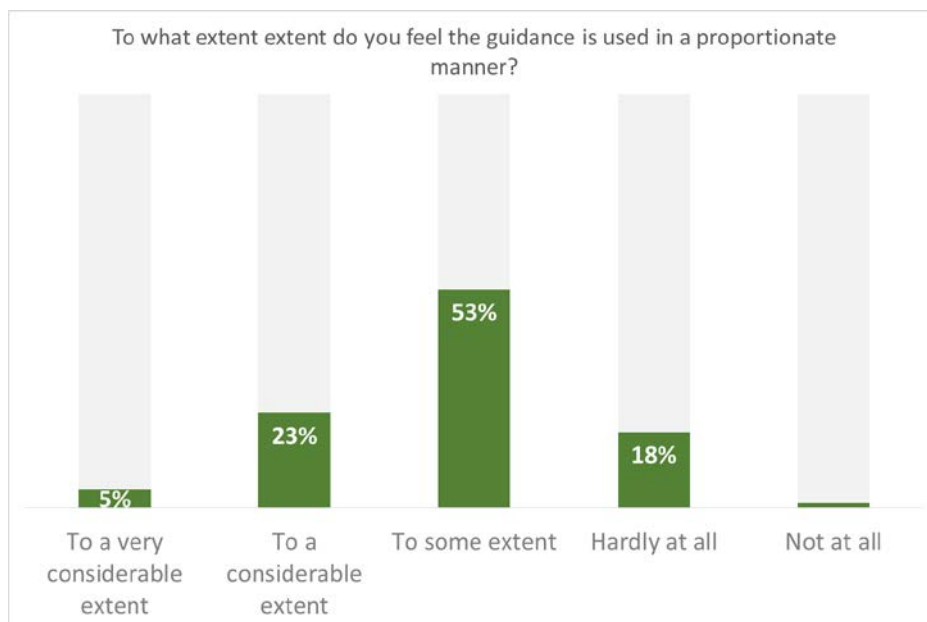
- More DfT resource to offer advice to individual cases and offer sign off stages of the appraisal process to avoid abortive work
- Too much flexibility may result in an inconsistent approach to scheme evaluation. Nationally agreed standards/advice would promote a more consistent approach

## Proportionality in WebTAG Application

A.30 It is the Department's intention that the guidance is used in a proportionate manner, whereby the evidence provided for transport appraisal is sufficient and not unduly burdensome. Figure 8 shows respondents' opinions on whether the guidance can be used in a proportionate manner.

A.31 The majority of respondents (80%) feel that the guidance is used in a proportionate manner at least 'to some extent'. A fifth of respondents feel the guidance is 'hardly' or 'not at all' used in a proportionate manner.

**Figure 8 Proportionality in WebTAG Application**



A.32 The open-ended question related to proportionality in WebTAG application might be similar to the previous question regarding the flexibility of implementing the guidance. Some answers in both sections are quite similar, so there might be some repeats.

A.33 A high number of respondents would like to see clearer definition and explanation of what proportionate mean. They also would like to see more examples of how to apply the guidance proportionally, i.e. what is and isn't proportionate. A set of case studies covering a range of schemes and successful implementation would be helpful.

A.34 Other views are:

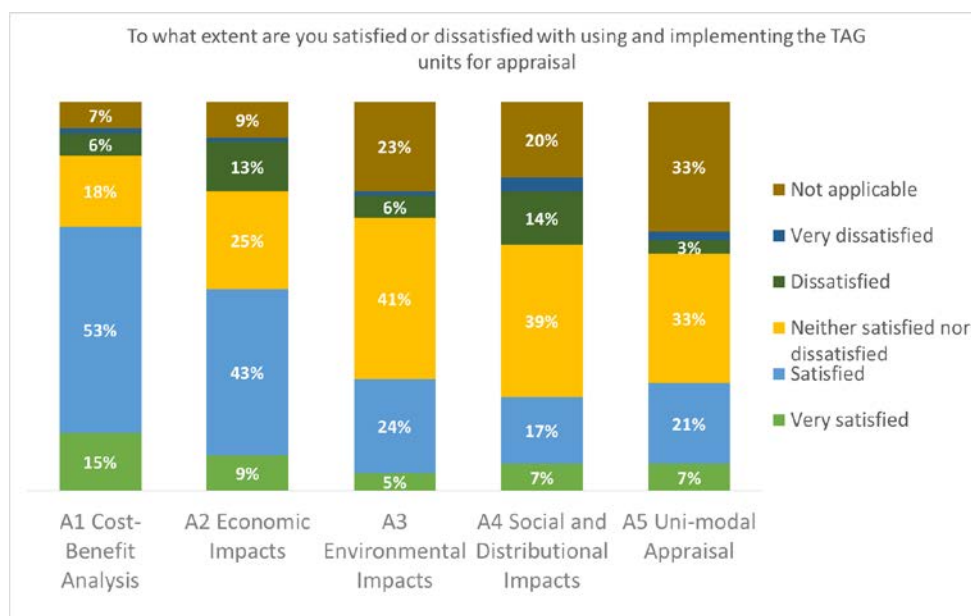
- Unclear proportional approach leading to over complicating projects
- Lack of understanding in some parts of DfT of what the appraisal is showing
- It involves judgement calls and knowledge and experience of users play the part
- "Is proportional approach to evaluation appropriate?"

- For smaller schemes, the requirements are burdensome and prohibitively expensive
- Calibration and validation targets are currently seen as prescriptive
- Area-based guidance (e.g. London-based VOTs) is needed
- Improve proportionality by making appropriate tools readily available
- One did not find TAG Unit 4.2 (Distributional Impact Analysis) useful
- It requires dialogue with DfT during business case development stages
- The staged gateway to preparing evidence base may be a way forward
- Provide a decision chart on key choices to identify proportional approach
- The issue applies to transport officers in local government, so the perception, process, and culture need to change

## Appraisal and Modelling Guidance

A.35 The survey asks about users' satisfaction or dissatisfaction with using and implementing the TAG units for appraisal and modelling. Figure 9 shows the results for users' satisfaction/dissatisfaction with the appraisal units and Figure 10 shows the results for the modelling units.

**Figure 9 Satisfaction/dissatisfaction for Appraisal Units**



A.36 Most respondents (68%) are either 'very satisfied' or 'satisfied' with Unit A1 Cost-Benefit Analysis, and just over half of respondents say so regarding Unit A2 Economic Impacts. Less than a third of respondents are 'very satisfied' or 'satisfied' with Unit A3 Environmental and A5 Unimodal with only just a quarter of respondents say so regarding A4 Social and Distributional.

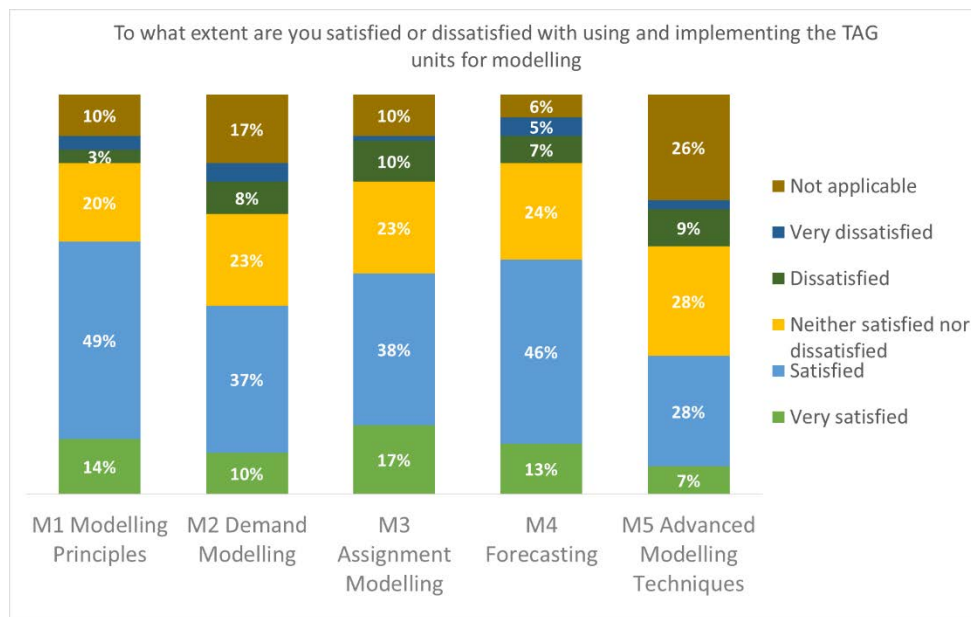
A.37 It seems that Unit A5 Unimodal is not widely used as it is 'not applicable' to over a third of respondents. Another third of respondents who use this unit are 'neither

satisfied nor dissatisfied'. About 40% of respondents are also 'neither satisfied nor dissatisfied' with using A3 Environmental and A4 Social and Distributional.

A.38 Respondents are least satisfied (i.e. 'very dissatisfied' or 'dissatisfied') with Unit A4 Social and Distributional (17%), followed by Unit A2 Economic (14%).

A.39 Comparing all appraisal units, respondents seem to feel more satisfied with Unit A1 and A2. Respondents are least satisfied about Unit A4.

**Figure 10 Satisfaction/dissatisfaction for Modelling Units**



A.40 Respondents are 'satisfied' or 'very satisfied' with Unit M1 Modelling Principles, M4 Forecasting, and M3 Assignment Modelling (63%, 59% and 55% respectively). The level of dissatisfaction (i.e. 'dissatisfied' or 'very dissatisfied') is similar across all modelling units; 13% for M2; 11% for M3, M4 and M5; and 7% for M1. Twenty to thirty per cent of respondents are 'undecided' across all units. Unit M5 Advanced Modelling Techniques is the least used as it is 'not applicable' to over a quarter of respondents.

A.41 Respondents provided some useful comments with main messages for appraisal are:

- A few respondents were not "convinced" that the Social and Distributional Impacts guidance provides useful evidence to inform decision-making. One stated, "it is a lot of effort for no real gain"
- More clarity is required for wider economic benefits. It is currently difficult to understand, as it is "written by economists for economists". It needs to be understood by broader range of users, decision makers and the public
- A few people expressed concerns over the guidance and philosophy on the Wider Impacts and Wider Economic Benefits. It is confusing and full of economic jargon.
- Wider economic benefits are very complicated. A better focus should be prosperity linked to increasing disposable incomes
- The assessment of agglomeration impacts is inconsistent with Dan Graham's original work

- WITA is more a concept than a workable approach. Every consultant has its own spoof of WITA which may or may not represent what DfT intends
- Consideration needs to be given to intrinsic value (e.g. landscape has a unique value, ecology, cultural heritage) not just economic impacts that are purely based on monetary value. This may be subjective but it is tangible
- More examples are required for assessing impacts, e.g. wider economic, environmental and social impacts
- There is a skewed towards journey time benefits, whilst travel time has hardly changed over the past 45 years, which implies user benefits take the form of improved access not time savings
- Transport economists accept the WebTAG approach, but transport planners see benefits differently and need guidance that relates to their concerns
- The WebTAG approach to new modes does not offer a practicable solution. The guidance for this is currently in the TUBA manual and not WebTAG
- WebTAG works well for road building but not for other modes or other mixed projects. The conflict for costs for road schemes compared with rail makes any rail proposal difficult to pursue. Public transport as whole is unfairly treated to a higher standard of proof
- A short summary at the front of each unit would be helpful

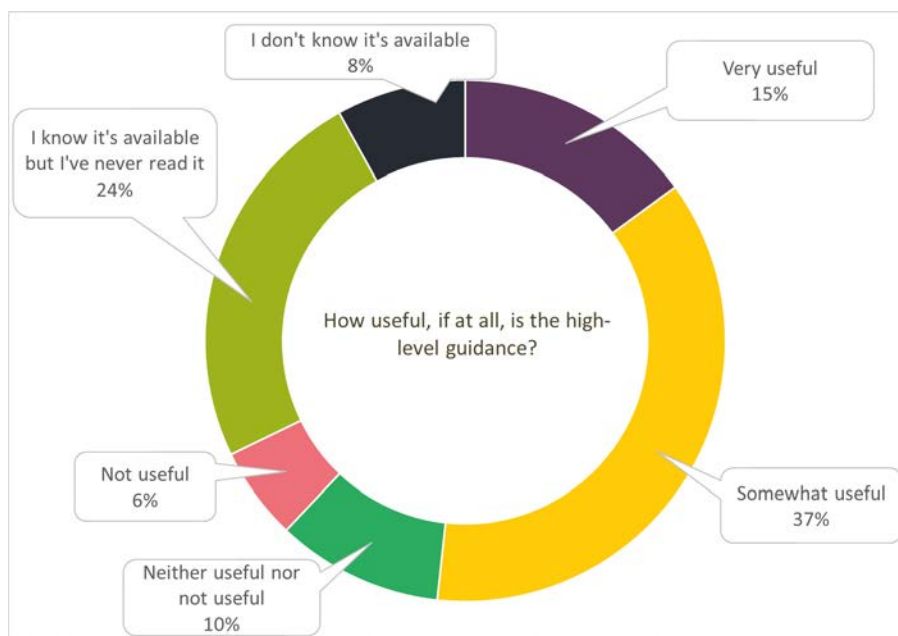
A.42 The following are main messages for modelling guidance:

- Allow other modelling techniques in appraisal, e.g. activity/agent based modelling
- Focus on new approaches, sophisticated techniques, and new data is needed, e.g. mobile network data
- Matrix building guidance is needed
- The TAG modelling units are not currently applicable for aviation
- Four-stage models are suited for input to cost-benefit analysis. Other models that reflect reality (representing access and land use change) are needed
- WebTAG approach to Variable Demand Modelling produces models that take too long to run and they are not practical
- Need models to account for cycling impacts and pedestrians
- M1 is becoming outdated
- M2 needs better guidance in general, e.g. incremental modelling, links between assignment OD and demand P/A, supply-demand convergence, calibration/validation of distribution and mode choice
- M3 needs reassessment of matrix estimation. Public transport guidance needs to be improved. Highway assignment guidance seems to be geared to SATURN. The validation of assignment models need to be reviewed and changed. M3 contains too many arbitrary targets without supporting evidence
- M4 fails to capture all sources of uncertainty
- Some practical examples are required

## High Level Guidance

- A.43 WebTAG provides high level guidance for Senior Responsible Officer (e.g. project promoters and sponsors) and technical project managers (who oversee the detailed modelling and appraisal work). Respondents were asked how useful is the high-level guidance and Figure 11 illustrates the results.
- A.44 Eight per cent of respondents did not know that the guidance is available with 24% knew its availability but have never read it. More than half of respondents (52%) found that the guidance is 'very useful' or 'somewhat useful'. There is a small percentage of respondents (6%) that think the guidance is 'not useful' and 10% are 'undecided'.
- A.45 A few expressed concerns that the Senior Responsible Officer (SRO), clients and decision makers do not actually read the high-level guidance. It is most important for them to understand the guidance and avoid over-specification of work.

**Figure 11 Usefulness of high-level guidance**

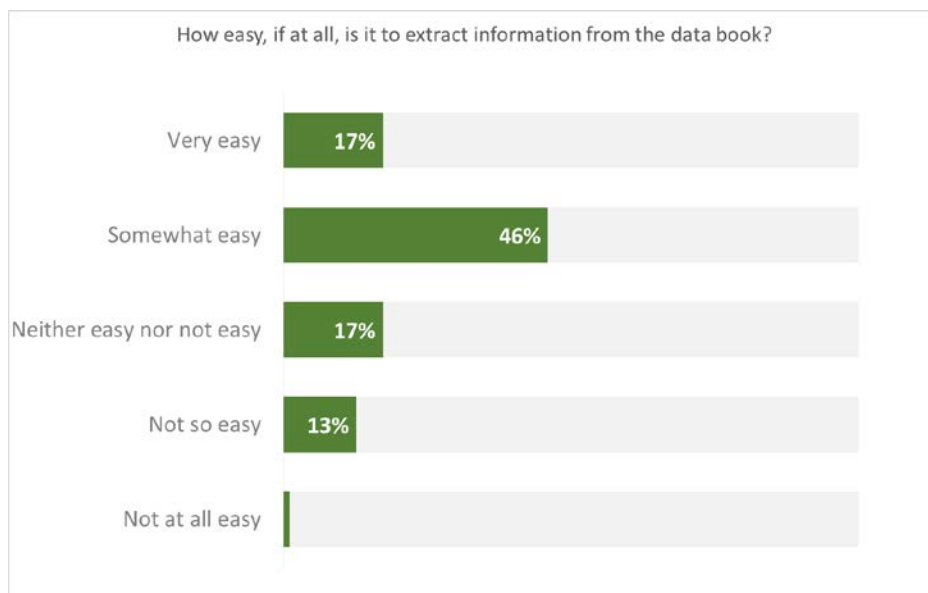


## WebTAG Data Book

- A.46 The WebTAG data book captures all of the appraisal and modelling values referred to in the guidance in one workbook. The respondents were asked how easy is it to extract information from the data book.
- A.47 Figure 12 indicates that 63% of respondents found the information from the data book is 'very easy' or 'somewhat easy' to extract with 14% think it is 'not at all' or 'not so easy'.



**Figure 12 WebTAG Data Book information**



A.48 Some messages are:

- One respondent thinks the complexity of it should be reduced, although no details were provided for this
- Easy access to the data book is required, without having to go into a unit and find the link in that unit
- Flexible table formats that can easily be imported to databases/models would be helpful
- It would be helpful to provide a PDF and/or MS Word version explaining the methodology for creating the values

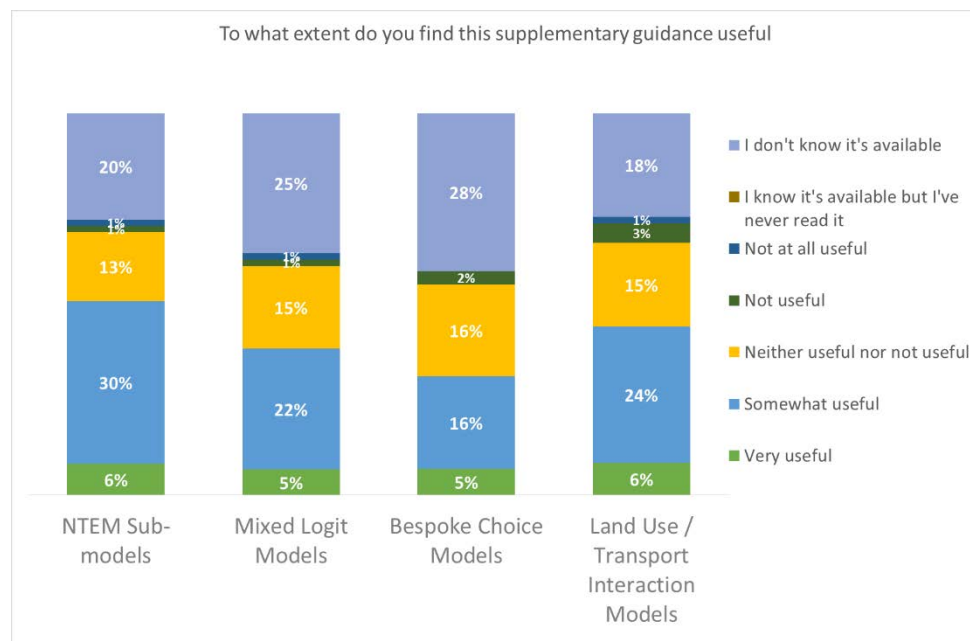
## Supplementary Guidance

A.49 The WebTAG provides further information on specific areas of modelling and appraisal methods, such as NTEM sub-models, mixed logit models, bespoke choice models and land use/transport interaction models. We seek respondents' views as to the extent of usefulness of this supplementary guidance.

A.50 Figure 13 shows that about one fifth to one third of respondents did not know the supplementary guidance was available. There was only very small proportion of respondents who found that the supplementary guidance was not useful, i.e. 4% for land use/transport interaction and 2% for others. The level of usefulness (i.e. 'very useful' or 'somewhat useful') of the supplementary guidance is rated quite low with 36% think guidance for NTEM sub-models is useful, 30% think so for land use/transport interaction, and less than a third think mixed logit and bespoke choice model guidance is useful.

A.51 Overall, the supplementary guidance does not seem to be known widely with low proportion of respondents think it is useful.

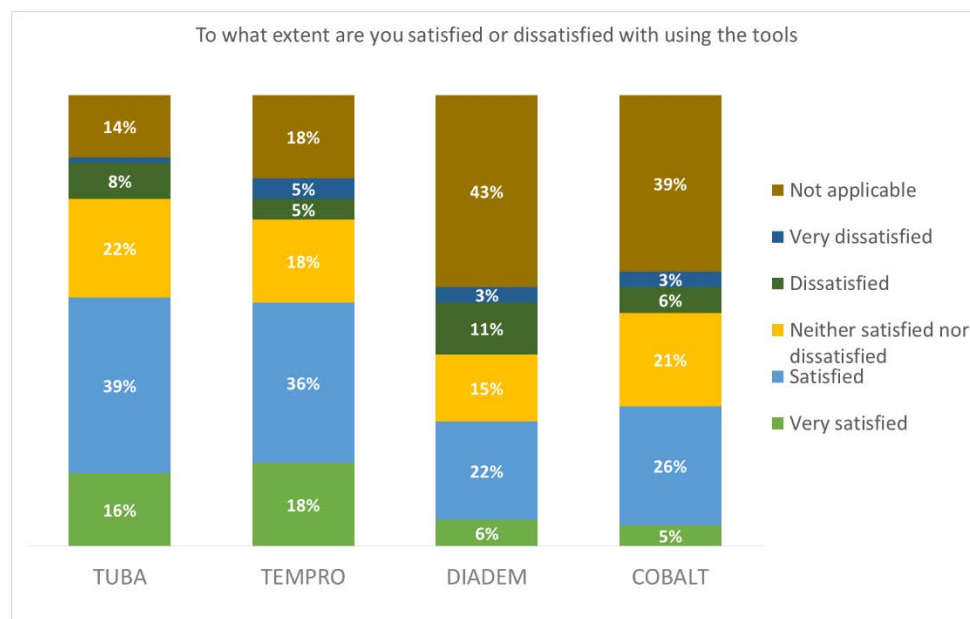
**Figure 13 Usefulness of Supplementary Guidance**



## Appraisal Tools

A.52 The Department has produced a suite of tools to ensure a consistent approach in transport appraisal, as well as reducing the cost of carrying out the analysis. We seek respondents' feedback as to what extent they are satisfied or dissatisfied with using the tools. Figure 14 demonstrates users' satisfaction/dissatisfactions with using the tools.

**Figure 14 Users' satisfaction/dissatisfaction with using the tools**



A.53 For DIADEM and COBALT, 43% and 39% of respondents (respectively) say using these tools is not applicable to them, which would mean they have never used the tools. Only about a third of respondents are 'satisfied' or 'very satisfied' with using these tools. DIADEM has the most dissatisfaction level with 14% of respondents are 'very dissatisfied' or 'dissatisfied' with it.

A.54 TUBA and TEMPRO seem to have been used the most with 14% and 18% of respondents (respectively) say the tools are not applicable to them. The satisfaction level is better with about 55% say they are 'satisfied' or 'very satisfied' with using TEMPRO and TUBA. About 10% are not satisfied with the tools.

A.55 General useful comments are:

- The tools need to have a more flexible format that can easily be converted into and integrated with the most common modelling platforms, so time is not wasted in converting files
- Better integration with existing modelling platforms would be preferred
- User group forum/meetings for these tools need to be reinstated
- The tools should be easy to install for all IM groups
- The tools do not work in the context of walking and cycling
- "DfT to be congratulated for taking the lead and developing these tools"
- TEMPRO:
  - It is not easy to extract information, e.g. providing raw data in CSV format would be useful
  - NTEM has over-predicted car growth
  - The underlying forecasts are diverting from reality
  - In its current form, WebTAG may encourage users to misuse growth figures without consideration of local context
  - Clearer and better advice is required regarding the implementation of trip growth using TEMPRO
  - Automation of outputs would be required
- TUBA:
  - "TUBA is software from the 90s, bring this into the 21st century"
  - It is old and needs a major overhaul
  - "Fussy to use and not easy to update to different years"
- DIADEM:
  - No on-going maintenance/update, which should be rectified to assist in variable demand modelling
  - Lack of commitment to keep improving is worrying
  - "DIADEM is the blackest of black box"
  - It is slow and cumbersome
  - Licensing issues

- It is very poor and inadequate for multi-modal modelling, e.g. fixed PT elements and other limitations make outputs unreliable
- COBALT:
  - Poor for reading in flow data exported from modelling software packages
  - Low confident in the results that come out of COBALT
  - It needs a network representation to allow for easy checks

## Missing Aspects and Potential for New Topics

A.56 One said that the major rewrite of guidance in 2014 was a major improvement. However, there are further improvements still needed.

A.57 The survey asks respondents to state any aspects that may have been missing from the current WebTAG. The following lists some key messages:

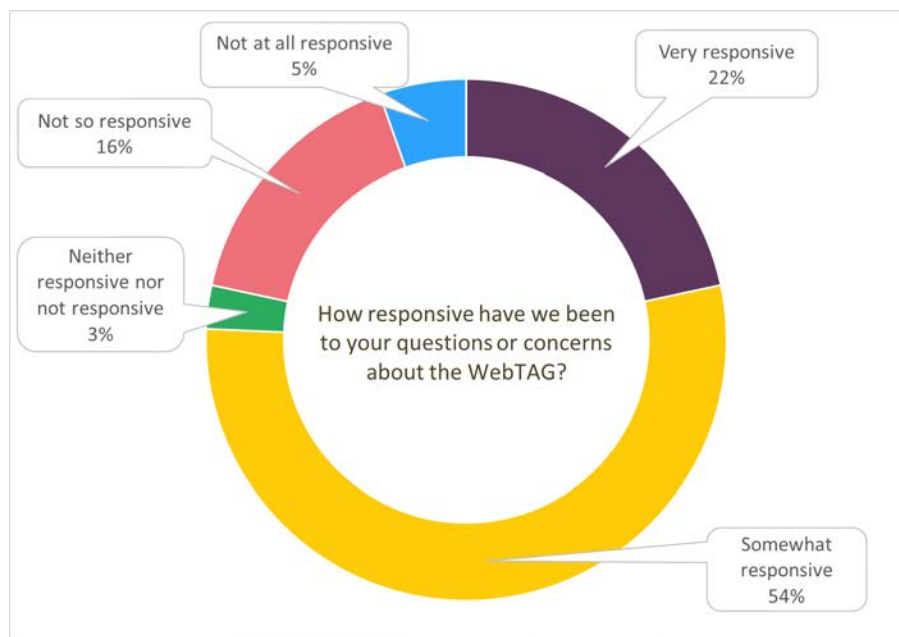
- DfT to host an education away day (or something like this) to educate people on WebTAG use
- Open community forum for continuous discussions on WebTAG
- Guidance on aviation (air traffic) is needed
- Include aviation changes in the Greenhouse gas Emissions worksheets
- Guidance on the use of new evidence and new data is needed, new techniques should be encouraged
- Guidance on matrix building, particularly from big data sources
- Better guidance on public transport
- How to appraise 'services' and not just infrastructure
- Better approach for modelling land use changes
- Guidance on active mode appraisal and modelling
- How to embrace the future of new mobility, modelling MaaS and CAV
- Need to tackle the fundamental problem of the lack of spatial analysis
- Keep things simple and do not lose sight of the evidence and appraisals will need to be understood by the public and decision makers
- More guidance around proportionality for schemes for varying scale – with specific examples and case studies of business cases
- More guidance on how to appraise schemes that are designed to improve the sense of place, reduce severance and encourage active/PT modes. The traditional transport appraisal has assumed a specific BCR value for transport schemes and doesn't take account the benefits of this type of scheme, e.g. unlocking development land (not related to BCR)

## DfT's Responsiveness

A.58 The respondents were asked if they have ever contacted the DfT to ask questions or express concerns about application of the guidance and 57% said they have never contacted DfT.

A.59 Respondents who contacted DfT, 76% said the Department was 'very responsive' or 'somewhat responsive' to their concerns or questions about WebTAG. However, about one fifth said the Department was 'not so responsive' or 'not at all'. Figure 15 shows the results.

**Figure 15 DfT's responsiveness to questions**



## Conclusions

A.60 The survey results were used to structure the workshop on 15th October. These will also contribute towards the overall consultation response.

A.61 Based on the survey results, the main options for the consultation theme of Supporting the Application of WebTAG and making it more User Friendly are<sup>7</sup>:

- General review of the guidance to streamline and clarify
- More case studies and worked examples
- Clarification of proportionality
- Address compliance culture
- Training course to improve understanding and change people's perceptions
- An 'educational' session for people who don't use WebTAG but need to either commission appraisal or make decisions on the basis of it

<sup>7</sup> It is worth noting that while this paper presents evidence from the WebTAG user survey, the conclusions are consistent with feedback from the regional consultation events

- Forum to share issues and have continuous discussions on WebTAG
- New guidance, e.g. new evidence/data, aviation, active modes, new mobility
- Better signposting and links

## WebTAG User Survey Questionnaire

How easy, if at all, is it to find the guidance you need on the Department's website (i.e. GOV.UK)?

Very easy

Somewhat easy

Neither easy nor not easy

Not so easy

Not at all easy

[Routeing for 'not easy' answers]. Please tell us how we can improve your experience when accessing the guidance on the website

How easy, if at all, is it to understand the guidance?

Very easy

Somewhat easy

Neither easy nor not easy

Not so easy

Not at all easy

Not applicable

[Routeing for 'not easy' answers]. Please tell us how we can improve your understanding of the guidance

The aim of WebTAG is to ensure evidence-based appraisal and analysis are in place to support the development of business cases and investment decisions. How easy, if at all, do you find implementing WebTAG?

Very easy

Somewhat easy

Neither easy nor not easy

Not so easy

Not at all easy

[Routeing for 'not easy' answers]. What changes would you like to see to improve your experience in implementing WebTAG?

WebTAG is intended to be guidance that is non-prescriptive and helps prepare outputs needed for appraisal in a flexible way (i.e. using the guidance without stifling innovation). To what extent do you feel it can be used in this way?

To a very considerable extent

To a considerable extent

To some extent  
 Hardly at all  
 Not at all

[Routing – for no answer]. What would you like to see in WebTAG that would allow you to use it in a more flexible way?

It is the Department's intention that the guidance is used in a proportionate manner, whereby the evidence provided for transport appraisal is sufficient and not unduly burdensome. To what extent do you feel the guidance achieves this?

To a very considerable extent  
 To a considerable extent  
 To some extent  
 Hardly at all  
 Not at all

[Routing – for no answer]. Please explain how you think it may be improved

The guidance for the appraisal practitioners provides best practice in preparing the necessary outputs for the appraisal of transport schemes and policy. To what extent are you satisfied or dissatisfied with using and implementing the TAG units for appraisal

	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Not applicable
A1 cost-benefit analysis						
A2 economic impacts						
A3 environmental impacts						
A4 social and distributional impacts						
A5 uni-modal appraisal						

If you are dissatisfied with any of the appraisal units, please tell us how you think the appraisal unit (or units) may be improved

The guidance for the modelling practitioners provides advice on the development of transport models that are used as evidence in the transport schemes and policies appraisal. To what extent are you satisfied or dissatisfied with using and implementing the TAG units for modelling



	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Not applicable
M1 modelling principles						
M2 demand modelling						
M3 assignment modelling						
M4 forecasting						
M5 advanced modelling techniques						

If you are dissatisfied with any of the modelling units, please tell us how you think the modelling unit (or units) may be improved

WebTAG provides high-level guidance for Senior Responsible Officers (e.g. project promoters and sponsors) and technical project managers (who oversee the detailed modelling and appraisal work). How useful, if at all, is the high-level guidance?

Very useful

Somewhat useful

Neither useful nor not useful

Not useful

Not at all useful

I know it's available but I've never read it

I don't know it's available

[Routeing – for those who know it's available]. Please tell us any comments or suggestions you may have regarding the high-level guidance

The WebTAG data book captures all of the appraisal and modelling values referred to in the guidance in one workbook. How easy, if at all, is it to extract information from the data book?

Very easy

Somewhat easy

Neither easy nor not easy

Not so easy

Not at all easy

Not applicable

[Routeing for 'not easy' answers]. Please tell us any suggestions to help us further improve the WebTAG data book?

The WebTAG provides further information on specific areas of modelling and appraisal methods. To what extent do you find this supplementary guidance useful

	Very useful	Useful	Neither useful nor not useful	Not useful	Not at all useful	I know it's available but I've never used it	I don't know it's available
NTEM sub-models							
Mixed logit models							
Bespoke choice models							
Land use / transport interaction models							

If you think the supplementary guidance is not useful, please tell us any comments or suggestions you may have

The Department has produced a suite of tools to ensure a consistent approach in transport appraisal, as well as reducing the cost of carrying out the analysis. To what extent are you satisfied or dissatisfied with using the tools

	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Not at all easy	Not applicable
TUBA					
TEMPRO					
DIADEM					
COBALT					

If you are dissatisfied with the software tools, please tell us why this is and how we could improve this

Have you ever contacted DfT to ask questions or express concerns about application of guidance?

Yes

No

[Routeing - if Yes]. How responsive have we been to your questions or concerns about the WebTAG?

Very responsive

Somewhat responsive

Neither responsive nor not responsive

Not so responsive

Not at all responsive

Not applicable

Please state any aspects that you think may be missing from the current WebTAG and should be added, or any other comments you may have.

[PERSONAL INFORMATION]

Please specify the type of organisation you work for

Central government

Sub-national and local transport bodies

Passenger Transport Executives

Local Authorities

Local Enterprise Partnerships

Consultancy

Academic and research bodies

Software developers

Other (please specify)

What is your role in the appraisal and modelling process?

Practitioner

Scheme promoter

Senior Responsible Officer

Technical project manager

Other (please specify)

What is your profession?

Economist

Transport planner

Transport modeller

Analyst

Project manager

Academic / researcher

Other (please state)

How many years of professional experience in transport modelling/appraisal do you have?

Up to 5

5-10

11-15

16-20

Over 20