Joint Analysis Development Panel
Annual Report 2018/19

Moving Britain Ahead

Contents

Forewords

This has been a hugely successful year for the Joint Analysis Development Panel. The panel has played a pivotal role in the development of our Appraisal and Modelling Strategy, with members leading a number of consultation events and subsequently shaping the priorities for development that we published earlier this year.

The panel's injection of academic thinking, practitioner insights and challenge has also been extremely helpful in other areas of our work including road traffic forecasts, understanding travel behaviour and analysis of interactions between transport and housing. We look forward to collaborating closely as we start to deliver the ambitions in our Appraisal and Modelling Strategy and tackle other analytical challenges.

Once again, my colleagues and I would like to thank all of the panel members for their constructive and insightful advice, with special thanks to my excellent co-chair, Professor Peter Jones, for his joint leadership of the panel.

Amanda Rowlatt, Chief Analyst

This report well illustrates the breadth of coverage and depth of analysis that has underpinned the work of the Joint Analysis Development Panel over the past year. These achievements would not have been possible without the active cooperation and involvement of a wide range of staff from within the DfT and other government agencies, and the enthusiastic support of the members of JADP.

The Panel has developed a working style that is both challenging and supportive, and this has resulted in very constructive and stimulating exchanges among the Panel members, which has I believe raised the quality of the debate and the published outputs, and has supported the Department in engaging more pro-actively with various external stakeholder groups.

In particular, I would like to thank and acknowledge the key role played by my co-chair Amanda Rowlatt, DfT Chief Analyst, who has strongly supported and encouraged this open and outward looking culture.

Peter Jones, Professor of Transport and Sustainable Development, University College London

Executive summary

1   The Department for Transport (DfT) is committed to maintaining and developing our appraisal and modelling methods so that our evidence base remains best practice. Working collaboratively with academics and stakeholders is central to this ambition and the Joint Analysis Development Panel (JADP) forms a core component of our academic and professional engagement.

2   JADP was established in 2015 to provide expert advice to DfT on its modelling and appraisal methods and strategies. It brings together academic and professional experts with senior departmental analysts and is co-chaired by the Department for Transport's Chief Analyst, Amanda Rowlatt, and Professor Peter Jones, Director of the Centre for Transport Studies, University College London.

3   The panel met six times in 2018/19 and provided advice and challenge on a broad spectrum of topics including DfT's Appraisal and Modelling Strategy, the Road Traffic Forecasts 2018, aligning the strategic and economic cases and the National Transport Model.

4   The panel continues to go from strength to strength. We are particularly grateful for the strategic direction and challenge provided by JADP during the development of the Appraisal and Modelling Strategy. JADP members provided invaluable support leading theme based workshops with external stakeholders, chairing discussions at consultation events and shaping the priorities for the strategy.

5   Panel discussions have also influenced a number of other areas of work. These include the Road Traffic Forecasts 2018 (RTF18), the development of housing cases studies, informing current and future work analysing ageing and transport amongst a number of other topics.

6   In addition, this year the panel has provided additional expert advice on the topics of uncertainty and RTF18. We are publishing an Uncertainty Stocktake alongside this report and a summary of advice on the RTF18 is summarised in Annex A.

7   We are grateful once again to all members for providing their time to attend meetings free of charge:

- Peter Jones, Professor of Transport and Sustainable Development, University College London (co-chair)

- Richard Batley, Professor of Transport Demand and Valuation and Director of the Institute for Transport Studies, University of Leeds

- Phil Goodwin[1], Emeritus Professor of Transport Policy, University College London and University of the West of England

- Glenn Lyons, Mott MacDonald Professor of Future Mobility, UWE Bristol and Mott MacDonald

---

[1] Due to other commitments Phil Goodwin temporarily recused himself from the panel in March 2019.

- Anthony Venables, Professor of Economics, Oxford University
- Tom van Vuren, visiting professor ITS Leeds and Mott MacDonald
- Tom Worsley, ITS Leeds

8   We were sad to say goodbye to Tom van Vuren who left the panel in October 2018 to work in Australia. We would like to thank him for his contributions to the panel over the last four years and strongly welcome the possibility of his return in the future.

9   We are also grateful to all the 'subject matter experts', named in Chapter 2, who have attended meetings to discuss areas of their expertise and provided insightful comments throughout the year.

1. Introduction

Background

1.1 This is the fourth annual report of the Department for Transport's Joint Analysis Development Panel. It covers the panel's activities from May 2018 to April 2019. This report summarises the panel's discussions and impact and is being published in the spirit of openness and transparency.

1.2 DfT is committed to maintaining and developing our appraisal and modelling methods so that our evidence base remains best practice. Engaging with academics and stakeholders is essential to achieving this ambition and the Joint Analysis Development Panel is a key aspect of our engagement with academics and professionals.

Format of meetings

1.3 The panel met six times during the year. The meetings ranged in structure from an extraordinary hour-long meeting to discuss the Appraisal and Modelling Strategy (AMS), the DfT's strategy setting out the priorities for developing our appraisal and modelling methods and tools over the next five years, to a working dinner and day-long workshop at ITS Leeds in November. Meetings are normally structured around two or three substantive topics with Departmental analysts presenting papers for discussion posing key analytical questions. The panel is usually supplemented by subject matter experts who have been invited to attend relevant topics.

1.4 Topics discussed this year were determined by DfT's priorities and suggestions from panel members. The main topic dominating this year was the development of priorities for the AMS where the panel has been invaluable, both in terms of steering priorities but also in developing and delivering our regional engagement events and theme-based workshops.

1.5 The full list of topics for 2018/19 were:

- Understanding Travel Behaviour - Young People's Travel: What's Changed and Why? And Ageing and Transport: Research Questions

- Road Traffic Forecasts 2018

- Developing a new Appraisal and Modelling Strategy: Consultation Document and Engagement Strategy

- Commission on Travel Demand

- Housing Case Studies

- Strategic Roads Appraisal Development: Progress & Plans

- Aligning the Strategic and Economic Cases

- Evidence Papers on how Transport Links to Wider Government Priorities
- Appraisal and Modelling Strategy: Prioritising Options
- Appraisal and Modelling Strategy Away Day focused on high-level questions about our tools before discussing in detail priorities across the themes
- Appraisal and Modelling Strategy
- Car Travel Econometric Report
- Road Traffic Forecasts Review
- National Transport Model v2r Transparency Review
- Appraisal and Modelling Strategy Release

2. Summary of Meetings

Introduction

2.1 This section summarises the discussions of the panel in its fourth year of operation. The panel has considered a range of different topics but special consideration and time was given for the development of our Appraisal and Modelling Strategy which sets out priorities for developing our appraisal and modelling tools over the next 5 years.

Summary of the meeting on 1st May 2018

2.2 Topics for discussion at this meeting were Understanding Travel Behaviour - Young People's Travel: What's Changed and Why? and Understanding Travel Behaviour - Ageing and Transport, Road Traffic Forecasts 2018 and Developing a New Appraisal and Modelling Strategy: Consultation Document and Engagement Strategy. Kiron Chaterjee, UWE, attended as a presenter and subject matter expert.

Understanding Travel Behaviour: Young People's Travel

2.3 Phil Goodwin and Kiron Chatterjee presented the findings from the DfT commissioned literature review and secondary data analyses[2] looking at young people's travel trends in England and the reasons for the changes in their travel behaviour. The review focused on two research questions:

1 In what ways have changes in young people's social and economic conditions, lifestyles and attitudes impacted on their travel behaviour?

2 How might those drivers, or other anticipated changes, be expected to impact their future travel demand?

2.4 The main findings of the work were presented such as declining licence holding for both younger men and women, total trips falling (mostly due to falling car trips) and decreased walking. The reduction in driving has been more substantial for men than women and they now have similar levels of car use. Since the early 1990s, each successive cohort of young people had shown lower driving licence acquisition, car ownership, car trips and car mode share. In the short run, there is a convergence in car use of young men and women that is not true for older groups. The turning point is around age 50, above which there are still signs of growing car use for both men and women. The research explored these trends by analysing a set of factors falling under the headings of demographics, living situations, socio-economic situations,

---

[2] Chatterjee, K., Goodwin, P., Schwanen, T., Clark, B., Jain, J., Melia, S., Middleton, J., Plyushteva, A., Ricci, M., Santos, G. and Stokes, G. (2018) Young people's travel – What's changed and why? Review and analysis. Project Report. Department for Transport.

information and communication technologies, values and attitudes and transport and mobility. The authors analysed the impact of each factor, considering hypotheses on all factors for which they had available data-sets.

2.5 Most factors were found to have a negative effect on getting a driving licence apart from the increase in women's employment up to the early 2000's which has now stabilised. The key interconnected factors are:

- **Increased participation in higher education**.

- **Less secure employment** and increase in the age at which people move into long-term employment. Young people in full-time employment are three times more likely to hold a driving licence.

- **Later age of marriage and having children.**

- **Increased urbanisation of young people.** Young people aged 25-34 are increasing living in dense urban areas and driving less than they used to in those areas. There is a counter-finding that young people aged 16-24 year in work are driving more than previously.

- A **rise in the cost of driving and housing costs**.

- **More time spent at home**, possibly because face to face interactions have been replaced with digital communication. Young men are spending 80 minutes more time per day at home than 20 years ago and young women 40 minutes more per day.

- **Some young people may not see cars as aspirational**.

2.6 The researchers then considered what is likely to occur in the future as cohorts get older. The researchers concluded it is likely there will be a sustained change in travel behaviour (with these cohorts driving less than previous cohorts) as the current generation of young people hold onto these behaviours as they age.

2.7 The panel discussed whether the findings of the study were likely to be affected by new technologies such as CAVs and Mobility as a Service. The research found that costs of transport have played an important role in the decline in licence holding but there is an equally important role for non-transport factors.

2.8 The panel discussed the importance of the findings and understanding how the causal impacts will change in the future, for example, increasing urban density. It was agreed that possible future work could further break down age and economic effects to look at distributional effects. It was also suggested that future research could look at the link between time spent at home and the observed decline in trip rate across the whole population.

2.9 DfT have subsequently commissioned secondary data analysis to explore the impact of transport access on life opportunities (for both young people and people from other age groups) and intend to publish findings when available later in 2019.

Understanding Travel Behaviour: Ageing and Transport

2.10 DfT Social and Behavioural Researchers presented a paper developed in collaboration with Dr Helena Titheridge (UCL) on key research areas to develop our

understanding of the impact of an ageing population on the transport system. The programme of work will focus on two areas:

1   Changing travel needs of the older population.

2   Potential emerging assistive technologies and mobility services.

2.11   The panel put forward a number of suggestions for the planned research to consider. It was noted that the question of where older people will be located in the future (e.g. urban vs rural areas) is an important pre-cursor to this. It was also suggested segmentation not just on age but also on mobility would be interesting as although linked, increasing age is not strictly less mobility. Other factors such as gender, wealth, location and health can have an impact on mobility – 'ageing' starts earlier for some groups of the population. Special consideration should be given for pedestrian trips – as people age they become frailer. It was suggested that the walking and pedestrian environment is very important for older people. Making it easier could be a key factor in the future. The walking and pedestrian environment is very important for older people given the higher risk of them tripping and injuring themselves.

2.12   It was noted between this and the previous paper there is a zone in the middle which does not belong to the 'young' or 'old' categories. It was suggested that it could be useful to look at transition points in life, such as when people retire, rather than just age.

Road Traffic Forecasts 2018

2.13   DfT presented a preview of the Road Traffic Forecasts (RTF18) which were due to be published in the next few months. The forecasts consider the key drivers of road traffic demand, whilst aiming to lead the thinking and analysis of future travel demand in England and Wales. RTF18 contained 7 scenarios:

- Reference

- High GDP Low Fuel

- Low GDP High Fuel

- High Migration

- Low Migration

- Extrapolated trip rates

- Shift to Zero Emission Vehicles

2.14   It was noted that DfT will continue to work on improving the model so it can better reflect travel behaviour in London. Also, consideration of future technology has explored the key uncertainties related to Connected Autonomous Vehicles (CAVs) that could possibly impact road traffic demand in the future. Panel member Glenn Lyons had provided further strategic advice on the forecasts, focussing on the handling of uncertainty in the report. This advice is summarised in Annex A.

2.15   The panel welcomed the development of the scenarios. It noted that the technology aspects are highly speculative and this needed to be emphasised. DfT stated that while the RTF18 scenarios were designed to explore the impact of **plausible** futures, the technology tests were designed with an emphasis to explore **possible** futures. DfT acknowledged that for this reason, extremes had not been fully explored and so not all the uncertainty has been captured. The panel also discussed how the

forecasts should be used and issues that can arise when applying national forecasts in a local setting. Some panel members suggested it could be useful for the scenarios to include one with level or falling car traffic, perhaps based around combined assumptions of extrapolated trip rates and more modest projections of population and GDP growth. DfT have agreed to consider this for future publications.

Developing a new Appraisal and Modelling Strategy: Consultation Document and Engagement Strategy

2.16 DfT circulated the first draft of the Appraisal and Modelling Strategy Consultation Document. It set out initial views of priorities for five key themes which had been developed through previous discussions with JADP:

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

2 Reflecting Uncertainty in a changing world

3 Modelling and appraising transformational schemes

4 Supporting the application of TAG

5 Developing and maintaining modelling and appraisal tools to meet user needs

2.17 DfT also introduced plans to raise awareness of the consultation and gather views from a wide range of stakeholders on priorities. The panel provided useful suggestions for additional stakeholders to include, for example, software developers and international stakeholders. The panel also supported the theme-based workshops proposed by DfT.

2.18 There was strong support for the 'Supporting the application of TAG' theme, with members noting the importance of building capacity and capability to implement changes to the guidance. The panel agree that there should be a greater emphasis on freight, including LGVs in the consultation document.

Summary of the Meeting on 27th June

2.19 The topics discussed at this meeting included Commission on Travel Demand, Housing Case Studies and the Strategic Roads Appraisal Development. Professor Greg Marsden, ITS Leeds attended to present the All Change? report.

Commission on Travel Demand - First Report

2.20 Professor Greg Marsden presented the findings of the All Change? report. He suggested that the transport profession has been focused on understanding growth in the demand for travel through income and car ownership and have lost sight of the fact travel is a derived demand which depends on the nature of activities people take part in. Greg put forward that recent declining trends are not a blip and there has been a sustained decline per person in the average number of trips made. The reason the decline has not been evident in outturn traffic data is because of population growth and the rise in van vehicle km. Van growth is not currently well understood and future work will consider this. Young people are travelling less by car

whilst older people are travelling more. Greg suggested we should not be looking to explain travel demand shifts with such a heavy reliance on transport variables. The activities people are taking part in are changing such as work and shopping from home. Technology is creating uncertainty but it is not just uncertainty in what transport technologies will be available but also in how the activities we travel for continue to change.

2.21 Greg put forward alternative approaches to dealing with uncertainty, each with advantages and disadvantages:

- Including different scenarios such as in Road Traffic Forecasts 2018

- Moving towards adaptive decision making with a view to investing in things that make sense in all scenarios. This can lead to different options being considered.

- Creating futures we want to see - investment decisions that lead to different futures. One example given was pedestrianisation of York city centre, the policy changed the future of the city. However, this is intrinsically a more political approach.

2.22 It was questioned whether 'changing' in 'changing travel' is an adjective or a verb. There are significant dynamics at play with behaviour irrespective of policy. It was suggested people's behaviour is more open to change than in the past.

2.23 The Young People's Travel research presented at the last JADP was run independently of this work. Both projects were very different in style with one focusing on particular cohorts and the other taking a much broader view. Even so, it was noted both projects have converged very closely on the implications for forecasting and policy.

2.24 The influence of cohort effects was discussed, including the fact they do not always continue. Older people are currently travelling more than the previous generation. However, this should not be taken as a given as pension provision in the future will be different and older people may be paying more for their care. This will impact on when people retire and with what resources.

2.25 The panel discussed peak car being a global phenomenon and understanding it is critical. It was noted that the second Roads Investment Strategy (RIS2) are looking at packages through the methodological lens of being adaptable to some of the potential uncertain trends.

2.26 DfT summarised the view that the challenge is grouped into three areas:

1 Technical - how to understand and model changes in trip rates

2 Planning - how forecasts are interpreted and used to inform decision making

3 Policy and devolution - how to present and use forecasts when seeking to align the view of different stakeholders

2.27 It was agreed that uncertainty and scenarios need to be presented in a way that is meaningful and helps decision making.

2.28 Greg explained that in the next year, the Commission for Travel Demand will focus on a set of smaller projects including van traffic, long distance travel and the travel behaviour of older people. It will be followed by a piece looking at what has happened to trends in the interim.

Housing case studies

2.29 DfT introduced a set of case studies looking at how housing impacts had been captured in the appraisal of three different transport schemes. There were two main objectives for developing the case studies:

1 To demonstrate to practitioners how the guidance can be applied in practice, with a focus on key areas of the guidance: establishing the dependency of new housing on the transport schemes; valuing the new housing; and taking account of the new housing in the Value for Money assessment provided to decision makers.

2 To demonstrate that housing impacts can and do influence decision making in DfT.

2.30 The panel agreed that case studies have the potential to be powerful as an educational tool. Overall, the panel viewed the case studies as a positive addition to guidance, however, they noted that there is a risk they could be taken out of context and used in ways not intended.

2.31 The panel made a number of helpful suggestions, including developing a larger number of case studies to provide sufficient diversity while pulling out best practice. Examples could also include when a scheme has not gone ahead or to highlight poor practice. The studies should also make clear how judgements on the analysis have been made.

2.32 DfT agreed that the case studies will need to include a number of caveats to try and ensure they are used and interpreted as intended. If they are found to be helpful, the intention is to widen the scope.

2.33 It was acknowledged that the process for quantifying the impacts of dependent housing is complicated but panel members felt that it is spelt out very clearly in TAG. Case studies could help bridge perception of guidance as 'scary and very precise' by showing how analysis in these areas has been undertaken before.

2.34 Finally, the panel agreed that the current approach of using tipping point analysis to see what would need to be believed for the scheme to be in different value for money categories is appropriate, due to uncertainty over the quality and depth of evidence. It was noted that as new housing is delivered evaluation evidence could be used to strengthen the evidence base.

Strategic Roads Appraisal Development: Progress & Plans

2.35 The Strategic Roads Division of DfT set out recent progress on developing strategic roads appraisal and plans for where next. The vision is to ensure that analysis is relevant, robust and trusted by:

• Building their understanding of the broadest range of scheme impacts;

• Developing cutting edge methodologies; and,

• Presenting results vividly and engaging with stakeholders.

2.36 In line with DfT's new Appraisal and Modelling Strategy, the team is now refreshing its direction, looking to new challenges including:

• Housing, people and place – how can we better represent these in our analysis?

- Interactions between schemes and the total impact in a place – how do we understand these better?

- New technologies – how should we reflect these and other sources of uncertainty?

- Freight – two thirds of freight is moved on the SRN, are we fully capturing its value?

2.37 Panel members commented that the programme of work looked good and well-constructed. The panel expressed an interest in seeing more detail on the projects relating to value of time in congested conditions and induced traffic and it was agreed that these would be shared with the panel and/or brought to a subsequent JADP meeting.

2.38 It was noted that for wider knock-on effects, analysis needs to be undertaken at the network level. One area of work is looking at the resilience of individual schemes and building wider resilience across the network. Highways England's Regional Traffic Models mean that the impacts on the wider road network can be picked up. RIS2 work has used these models to put together packages of interventions to see how they inter-relate in terms of complementarity and substitutability.

2.39 The panel discussed road demand trends including the relationship between urban and inter-urban travel and the importance of scenarios to reflect uncertainty and future-proof analysis.

2.40 DfT's Strategic Roads and Road Economics and Modelling Divisions have been developing the way in which wider economic impacts are modelled, building on the new TAG guidance on wider economic impacts.

2.41 The panel noted the importance of continuing research on the value of time due to how fundamental it is to the business case for road schemes. It was noted that the OECD/ITF were holding a roundtable entitled 'Zero Value of Time' chaired by Tom Worsley with Phil Goodwin and Richard Batley presenting and Glenn Lyons also on the panel[3].

Summary of the Meeting on the 3rd October 2018

2.42 The topics discussed at this meeting included aligning the economic and strategic cases, two evidence papers on how transport links to wider government priorities of health and inequality and the Appraisal and Modelling Strategy: prioritising options. This was Tom van Vuren's last meeting before moving to Australia. DfT thanked him for his significant contribution over the past three years and wished him well.

2.43 The panel was thanked for all their support attending and presenting at regional engagement events and for organising and leading theme-based workshops as part of DfT's consultation on priorities for an Appraisal and Modelling Strategy.

---

[3] Their contributions, and others, are now published in the ITF Round Table Report at https://www.itf-oecd.org/zero-value-time-roundtable

Aligning the Economic and Strategic Cases

2.44 DfT introduced work aimed at understanding why the strategic and economic cases can sometimes point to different conclusions about the strength of the case for a scheme. An advice note was circulated beforehand outlining situations in which the two cases can become misaligned and recommendations for analytical approaches to solve this.

2.45 The panel suggested that the strength of TAG - which provides guidance on producing the economic case - compared to the much higher level strategic case guidance will lead to a misalignment. DfT noted that they published two supplementary strategic case guidance documents in 2017 to allow scheme promoters and business case authors to consider how schemes may align with the objectives set out in the Transport Investment Strategy. In addition, there is a further programme of work to make the strategic case guidance more detailed.

2.46 It was mentioned that making the two cases consistent does not mean they must converge to the same conclusion. However, it is important they are based on consistent evidence. The panel noted the different personnel delivering the two cases may come from different teams and professional backgrounds. TAG - particularly the Appraisal Specification Report - could help to push for better interaction between the two cases with a possible handover between the strategic and economic case teams.

2.47 Evaluation of claims within past strategic cases, for example in relation to the impact on jobs and housing, could better inform the assumptions made in future strategic and economic cases and better align the two.

2.48 The panel suggested a framework to explore why the two cases differ:

1 Objectives - local versus national considerations or framing of objectives is different, for example, GDP growth versus welfare considerations.

2 Instruments - one team may only look at transport interventions compared to a wider package of schemes.

3 Tools and techniques - economic analysis versus wider non-monetised considerations.

These differences could then be tackled in turn leading to objectives matching up.

Evidence papers on how transport links to wider government priorities

2.49 DfT has started work looking at the value for money of schemes and how the Department can make a case for transport's role in meeting other government objectives. The following two early draft papers on Health and Inequality were discussed.

Health

2.50 The panel noted that the paper does not include much on noise but there is quite a lot of evidence now on how noise affects health. It might also be helpful to be clear about what is already included on noise in TAG.

2.51 Some panel members expected the magnitude of impacts on air quality to be greater. It was noted that the focus should be on areas where benefits from transport intervention is likely to be greatest. The changing nature of local air quality emissions from vehicles was also noted. As electric vehicles replace internal combustion vehicles, brake and tyre emissions will rise up the agenda as tailpipe emissions are reduced.

2.52 It was noted that recent work on active travel in DfT adds robustness to the high benefit-cost ratios found for these schemes that are mainly due to the health benefits.

2.53 The panel discussed some added aspects that could be considered. These included mental health including the impact of loneliness and the personal security dimension of transport. It was cautioned, however, that the relationships here are complex and identifying them as casual is difficult. It is also important to consider the long-term effects of stress due to overcrowding and driving in congested conditions. These are unlikely to be captured in previous work on valuing the impacts in congested conditions. There are also likely to be adjustment effects - for example, people may be more likely to adjust to congested public transport conditions in central London.

Inequality

2.54 DfT introduced the paper suggesting that the focus of the literature review would be on income inequality. It was noted that there are many ways to define inequality in relation to transport including wealth, region, gender and intergenerational; it was suggested by panel members that the literature review should look more widely than strictly income inequality. Geographical segmentation is important, as is nature of employment and gender. Age was identified as especially important, with the redistribution of wealth from the young to the old possibly leading to previously explored topics at JADP such as declining travel demand and licence-holding by the young.

2.55 Many suggestions on other areas surrounding inequality were made:

- Inequality of emissions - although the literature is mixed, lower income groups who are more likely to walk may be disproportionately affected by car drivers polluting. It was countered that the relationship may also work the other way. Lower income groups may have older more polluting cars. Richer groups, especially in cities may be more likely to cycle and walk. The discussion indicated the knowledge gap in the distributional impacts of air quality.

- Inequality in travel time - in the literature there is evidence of an inverse relationship between commute time and income.

- Inequality in resilience - lower income groups are much more likely to be reliant on just one form of transport whether that is a bus service or their car. If the car breaks down or the bus service disappears this can have a major impact. Richer groups are more likely able to adapt through having more travel options available to them.

Appraisal and Modelling Strategy: Prioritising Options

2.56 DfT introduced potential criteria to sift through options in the Appraisal and Modelling Strategy from the consultation engagement and responses. They were used to initially sift through the long list of possible considerations as the strategy developed.

2.57 The panel agreed that the criteria looked good. It was cautioned that options deemed to be long-term may still be a priority - warning that there was a risk that long-term becomes code for later. Capacity internally and externally in the Academic sector to enable delivery of the strategy should be a key consideration. Similarly, consideration for the ability of external stakeholders to adapt to any changes to appraisal and modelling should be at the forefront of the prioritisation process. The panel suggested there may be a need to provide support such as training if options are taken forward that aim to change the culture of TAG application and use.

Summary of the Joint Analysis Development Panel: Workshop on the Appraisal and Modelling Strategy on 6-7th November

2.58 The panel and members of DfT's Transport Appraisal and Strategic Modelling division attended a working dinner and workshop on the 6th and 7th November in Leeds. We would like to take the opportunity to thank ITS Leeds for hosting the workshop. We would also like to thank Helen Bowkett (Arcadis, UWE), Tim Foster (TfN), Neil Chadwick (Steer), Peter Mackie (ITS) and John Nellthorp (ITS) for providing expert insight which helped shape the strategy at this crucial stage.

2.59 The workshop began with a summary of the discussion at regional engagement events, the outputs from the theme-based workshops and the consultation responses themselves. The discussion resulted in a number of high level conclusions:

- The appraisal framework needs to adapt to better meet the needs of devolved areas. This includes addressing the demand for greater use of local data and evidence in appraisal.

- The importance of ensuring models are fit for purpose was emphasised, alongside recognition of the skills shortage in this field.

- One approach for longer-term research areas would be to identify a number of priority areas and undertake some small scoping studies to develop a better view of what can be achieved with different timescales.

- The importance of early intervention, particularly around option generation, came up repeatedly and was recognised as something that would increase in importance with greater consideration of uncertainty.

- Supporting the users of TAG is a priority and this should include knowledge sharing, education and making the guidance easier to access.

- There is a need to maintain and update what's already in TAG. Given the resource challenges, one option would be to have a forward programme for updating key values.

- The three broad priorities for developing the evidence base were identified by the panel as better understanding and reflecting uncertainty, understanding cities and projects that increase the spatial capacity of cities and valuing the urban realm. Any development needs to consider the ability of the sector to implement changes in guidance.

- Working with others to deliver the strategy should include collaborating on research and assurances on new external evidence being accepted.

2.60 The panel were asked to consider a number of questions during the day.

Devolution

2.61 The panel agreed that TASM has a unique role in:

- **Ensuring comparability and consistency** - across regions, local authorities and schemes. The panel identified greater scope for collaboration with urban bodies and sub-national bodies.

- **Information sharing** – identifying what has or has not worked including innovative interpretations of TAG.

- **Education** – including courses on applying TAG.

- **Developing the evidence base** – it was noted that sub-national bodies and other local organisations may be best placed to develop elements of the evidence needed.

- **Leadership** – on tools, data and application. The panel raised the importance of TAG helping decision-makers understand the process better. As previously discussed, the roles of the strategic and economic dimensions are important here, especially in the option generation phase. Uncertainty and reflecting this to decision-makers was also key in both the early option generation stage and economic case stage.

Balancing Maintenance of TAG and Further Development of the Evidence Base

2.62 There was broad agreement that DfT should consider first what more can they get out of what we currently have. The strategy needs to be clear about its vision from outset: what changes to TAG are realistic, what are incremental changes or transformative? Maintenance, communication and acknowledgment of missing elements needs to be included. It was important to have a consistent framework to run through and order work in a logical way.

Transformational Investments and Housing Priorities

2.63 There was discussion over TAG's assumption of fixed land use and how challenging moving away from this would be. It was suggested that a first step would be to explore issues such as the definition of 'transformational' and what interventions may have transformational impacts and that there should be greater consideration for the strategic case guidance in this area. DfT should encourage increased transparency of Supplementary Economic Models. Also, the use of case studies to clearly explain transformational schemes and the analysis behind them was seen as helpful. Evaluation should also feed in to support learning in this area.

People and Place Priorities

2.64 The three main topics discussed were:

- **Urban realm** - looking at the value of place was considered important. A first step would be a scoping study to better understand the methodologies to value such interventions.

- **Journey quality** - consideration should be given for congested values of time, the productive use of time and reliability.

- **Health and wellbeing** - work streams could include forecasting walking and cycling, active modes research and personal security. There was agreement amongst panel that externalities of transport such as air quality and noise are currently well-captured.

Uncertainty Priorities

2.65 The panel discussed that analysis and understanding of uncertainty is at an early stage. There is confusion over definitions, relationship with risk, shallow versus deep uncertainty and with interpretation. There was support for an uncertainty toolkit that could potentially sit out of TAG and provide an opportunity to try different approaches and learn from others. It was felt that small steps should be taken as it would be impossible to introduce a unit, for example, on uncertainty in one go that was as robust as the rest of the guidance. The panel suggested considering uncertainty as decision-making being future-proofed: given a full view of uncertainty, would the investment decisions made be different? Decisions should be robust to different outcomes. It was argued this might put more emphasis on more flexible shorter-term options rather than large scale fixed infrastructure and that strategic thinking is needed earlier on in process.

2.66 Educating decision makers on how to interpret uncertainty analysis and customers on how to present scenarios to them is important. It was suggested that one way to present scenarios to decision makers would be to say over this range of situations, this scheme performs well but if x happens it would not be such a good choice. Ranges of value-for-money may provide a high-level way of communicating uncertainty. A requirement to carry out full appraisal on at least two (high and low) scenarios was suggested as a practical and logical way of taking this forward.

2.67 NTEM and TEMPRO could incorporate more useful scenario planning.

Modelling Guidance

2.68 The main discussion points were the changing use of models, the resource challenges of modelling, suggested gaps in current modelling such as freight and changing behaviour, extraordinary events such as line closures and the importance of availability and access to data.

2.69 The panel suggested DfT should have a role in encouraging innovation and the simplification of modelling. However, it was suggested these two may be at odds with each other especially with a skills shortage in the industry.

Application of TAG

2.70 JADP discussed the structure of guidance, education, and information sharing. Simplifying the guidance does not necessarily mean poorer quality. It could include layering the guidance and structuring it in a way that is intuitive. It was suggested that DfT could look cross-government for best practice examples of easy to use technical guidance. On education, it was suggested that DfT runs TAG courses for new practitioners. The course could include an exercise applying the guidance that could test how intuitively easy (or otherwise) it is to use. Sharing information such as case studies could be really helpful at highlighting best practice. Setting up a process for continual feedback and engagement from industry and the Department is needed to better refine the guidance.

Prioritisation

2.71 The panel suggested maintaining a long-list of proposals at this stage. It was noted a lot of the topics would require scoping studies to identify methodologies before primary research. This should also allow DfT to explore a wider set of topics to begin with.

Summary of Meeting on 22nd January

2.72 This meeting was a shorter hour-long meeting to discuss the first draft of the Appraisal and Modelling Strategy. It was a sense-check on the current priorities as well as high-level comments on the strategy document. It involved an extensive list of priorities which was expected to be further refined. Panel members were joined by Helen Bowkett (Arcadis, UWE) and Neil Chadwick (Steer Davies Gleave).

First Draft of the Appraisal and Modelling Strategy

2.73 JADP noted that the list of priorities further signified the need to reach out externally to deliver the strategy. The panel supported the emphasis in the strategy on the themes of openness and transparency that were welcomed during the consultation process.

2.74 The panel also offered several suggestions on making the strategy document more readable and user-friendly.

2.75 The panel made various suggestions for tightening up the scope and content of the strategy, particularly for the wide-ranging people and place theme. The need to define uncertainty and the different types of uncertainty was emphasised. It was also suggested the draft could include more content on capturing the links between transport and housing. Case studies were unanimously encouraged. Also welcomed was the planned encouragement of transparency of DfT's modelling tools.

Summary of Meeting on 13th March

2.76 The topics discussed at this meeting were Car Travel Econometrics Report, Road Traffic Forecasts Review, a final Appraisal and Modelling Strategy update and the National Transport Model v2r Transparency Review. Thanks to Simon Nielsen, Head of Strategic Analysis, Transport for London for attending this meeting.

Car Travel Econometrics Update

2.77 DfT summarised the main findings of the report published in October 2018 which used a three-stage regression approach on NTS data between 1995 and 2012 to consider how socioeconomic and demographic characteristics are related to the decision to hold a driving licence, the decision to own or share a car and the distance people drive. The main findings included:

- Year of birth effects were important.

- A positive and non-linear relationship between income and licence holding as well as a linear relationship with mileage was found.

- Employment or in education indicates licence holding.

- Women were less likely to get a licence but those who did were found to have a higher likelihood of having access to a car although they were found to drive less than their male counterparts. There is evidence these differences are getting smaller with younger cohorts.

- Having two or more adults or children in a household increased the rate of car access.

- Urbanisation, most notable a 'London' indicator reduced all licence holding, car access and mileage.

- Overall, the impact of being younger is having a more negative impact on licence holding and car access in recent years which tallies with evidence elsewhere.

2.78 The paper was welcomed by the panel who made suggestions for further work. These included considering the implications of modal shift and commuting behaviour and rail versus car competition, especially in Northern cities. Income results could be explored further by looking at elasticities which may be more revealing.

2.79 The changing perceptions of ownership in the age of ride-sharing and Mobility as a Service may have implications for the NTS data. The panel noted that it's encouraging that the report is broadly consistent with the wider literature on changing travel trends. Revisiting the literature may also provide new extensions to the work that should be considered before this work feeds into National Trip End Model.

Road Traffic Forecasts Review

2.80 DfT is undertaking a review of the role of road traffic forecasts going forward, seeking to build on the progress made in RTF18. Many improvements were implemented in RTF18 including reviews of the past performance of forecasts and broadening forecasts to including emerging technologies such as Electric Vehicles and Connected Autonomous Vehicles. DfT noted it was time to reflect what the best role of the forecasts is with an emphasis on developing something with the users in mind. Following on other work within TASM such as the AMS and the Car Travel Econometrics report, the review aims to consider what the best approach for the forecasts is in a rapidly changing world.

2.81 It was noted that the panel provided useful ad-hoc advice during the RTF18 process. DfT are keen to build on this by including the panel and the wider external academic community in discussions on the future direction of the forecasts at an early stage.

2.82 The panel put forward many useful suggestions and questions for consideration such as establishing what users do with the forecasts. Are they used as traffic forecasts by devolved or local areas for figures outside of their areas of immediate interest? The scope of the scenarios was discussed - are they stress tests? Should the emphasis be on plausible scenarios or possible scenarios? It was also noted other bodies use forecasts for policy testing achieving strategic objectives. The issue of devolution also puts into question what the purpose of the national forecasts are.

2.83 It was put forward that the community around rail forecasting focuses more on the toolkit rather than the forecasts themselves. The transparency around these tools was raised by the panel. It was countered however the role of DfT with roads and the Passenger Demand Forecasting Council for rail is different leading to the environment that surround discussions around the subject being different.

2.84 One particular focus agreed by the panel was better forecasting of freight, not only in heavy-goods vehicles but the rise of vans in tandem with changing economic behaviours.

Appraisal and Modelling Strategy Update

2.85 A final draft of the AMS was presented to the panel. Where permission has been given, consultation responses as well as summaries of the workshops chaired by panel members will be published alongside the Strategy. The panel was thanked for helping refine the strategy into something realistic and achievable. DfT noted the proposed annual TAG conference will provide timely updates on progress with the strategy.

National Transport Model v2r Assurance and Transparency Plan

2.86 DfT introduced a plan that includes the two core objectives of improving the level of transparency of the National Transport Model and testing the performance of the latest recalibrated version of the model (version NTMv2R). To meet the objectives the planned work includes four key stages: a series of stress tests, back-casting, the publication of documentation and external engagement. The stress tests and the development of back-cast model will help to achieve a better insight of the model's performance. The publication of results of the above modelling work, the publication of additional modelling reports, as well as the planned external engagement will combine to achieve the second objective, to improve transparency and understanding of the model's capabilities. Building on this DfT will be able to better define the purpose and robustness of the model when being used for forecasting and as a policy testing tool. Stress tests will be used to examine responses to different model inputs and the development of a back-cast model will include a single back-cast year.

2.87 The panel was supportive of the work program and wanted to know how this would feed into development of NTMv5. DfT is considering this and it is likely the lessons learned and practices put in place in terms of transparency will feed into v5. A key issue to consider is the level of segmentation - even when the model performs well at an aggregate level it may struggle to accurately represent trends at a more localised level. Questions were raised about the audience of the review and wider questions about 'what makes a good model?'.

3. Next Steps

3.1 This has been a busy and productive year for the panel working closely with the Department throughout the year to develop the Appraisal and Modelling Strategy. Panel members have been influential in the development of priorities for the strategy and are well placed to steer the initial phase of delivering the strategy.

3.2 Over the first half of the year the panel will discuss topics including the development of an uncertainty toolkit, people centred business cases, transport and housing analytical work, the value of time in congested conditions and further development of the National Transport Model and National Trip End Model.

3.3 As part of our ambition to further strengthen the role of the panel, we advertised for expressions of interests from experts in the transport community wishing to join the panel. We will announce the new members of the panel in due course.

3.4 We will continue to identify opportunities to work with the panel to further engage with stakeholders and look to use their expertise to help deliver, maintain and challenge improvements to our appraisal and modelling tools.

4. Biographies

Peter Jones OBE

4.1 Peter Jones is Professor of Transport and Sustainable Development. His PhD, DIC (Engineering) Thesis from Imperial College was entitled: 'The Development of a New Approach to Understanding Travel Behaviour and its Implications for Transportation Planning'. Before joining UCL in 2005, Peter was director of the Transport Studies Group at the University of Westminster where he carried out numerous research projects funded by organisations including the Department for Transport, the European Commission, the Joseph Rowntree Foundation, and BAA.

4.2 He is a member of the Independent Transport Commission, the London Roads Task Force, the UCL Grand Challenges Sustainable Cities theme leader for Transport & Sustainable Mobility, and Chair of the RGS-IBG Transport Geography Research Group. He is Overseas Special Advisor to the International Association of Traffic and Safety Sciences, Japan, and a member of the International Steering Committee for the International Travel Survey Conference and a member of the Technical Committee of the South Africa Transport Conference.

4.3 He has also acted as a consultant to Transport for London, the European Commission and several national and local governments.

Richard Batley

4.4 Richard Batley is Professor of Transport Demand and Valuation and Director of the Institute for Transport Studies (ITS), University of Leeds. With a disciplinary background in transport economics, Richard's specialist expertise covers two related areas: first, valuing qualitative aspects of travel (e.g. journey time, punctuality and comfort) in monetary terms, and second, forecasting the impacts of changes in these qualitative aspects on the demand for travel.

4.5 He has operated mainly at the interface between academe and public policy, and can demonstrate lasting impacts from his research, especially in the form of official UK policy and practitioner guidance issued to transport operators and transport scheme promoters. Richard has reported research outcomes to senior public servants and politicians (e.g. to transport ministers, and to the House of Commons Transport Select Committee). He played a leading role in the programme of research, underpinning the Department's 2017 major update to appraisal guidance on The Value of Travel Time Savings.

Phil Goodwin

4.6 Phil Goodwin is Emeritus Professor of Transport Policy at University College London and University of the West of England. He was previously Director of the Transport Studies Unit, an ESRC centre of excellence at Oxford University and UCL, a transport planner at the Greater London Council, and non-executive Director of the Port of Dover.

4.7 He was a member of SACTRA and co-author of its three reports on Transport and the Environment (1991), Induced Traffic (1994), and Transport and the Economy (1999). He has carried out research for the DfT and other agencies on travel demand, transport appraisal, road and public transport projects, road pricing, suppressed traffic, smarter choices, wider economic benefits (and losses) and transport strategy.

Glenn Lyons

4.8 Glenn Lyons is the Mott MacDonald Professor of Future Mobility at UWE Bristol where he was previously Associate Dean for Research and Enterprise in the Faculty of Environment and Technology and the founding Director of the Centre for Transport & Society. Since January 2018 he has been seconded for half his time to Mott MacDonald, bridging between academia and practice. His position is helping to further develop the consultancy's transport expertise in relation to understanding and responding to a changing and uncertain mobility landscape, which is shaped by technological possibilities and societal needs and preferences.

4.9 A former secondee to the UK Department for Transport and more recently to the New Zealand Ministry of Transport, Glenn has led major studies into traveller information systems, teleworking, virtual mobility, travel time use, user innovation, road pricing, public and business attitudes to transport, and future mobility. He is now actively engaged in examining the future prospects for technological innovations including Connected Autonomous Vehicles and Mobility as a Service. He has been involved in several strategic futures initiatives and recent and ongoing engagements include helping transport authorities adopt a vision-led approach to strategic planning that can accommodate deep uncertainty and thereby achieve more resilient decision making. Glenn is a Trustee of the Chartered Institution of Highways & Transportation and of the Rees Jeffreys Road Fund.

Anthony Venables CBE, FBA

4.10 Tony Venables is Professor of Economics at Oxford University where he also directs a programme of research on urbanisation in developing countries and the Oxford Centre for the Analysis of Resource Rich Economies. He is a Fellow of the Econometric Society and of the Regional Science Association, and is a Fellow and Council member of the British Academy. Former positions include chief economist at the UK Department for International Development, professor at the London School of Economics, research manager of the trade group in the World Bank, and advisor to the UK Treasury.

4.11 He has published extensively in the areas of international trade and spatial economics, including work on trade and imperfect competition, economic integration,

multinational firms, economic geography, and natural resources. Publications include "The Spatial Economy; Cities, Regions and International Trade", with M. Fujita and P. Krugman (MIT press, 1999), and "Multinationals in the World Economy" with G. Barba Navaretti (Princeton 2004).

Tom Van Vuren

4.12 A transport modeller and demand forecaster, Tom van Vuren combines an interest in academically sound theory with experience and pragmatism in application to real life situations. As a Visiting Professor at the University of Leeds and a Divisional Director at Mott MacDonald he is well positioned to advise the Department for Transport on making their analytical methods accessible to the profession. He has been a long-term supporter of TASM's efforts to make forecasting and appraisal more transparent, and in particular WebTAG as a tool to improve best practice.

4.13 Throughout his career, Tom has emphasised and contributed to knowledge sharing in modelling and forecasting. Between 2008 and 2010 he was Chairman of the Association for European Transport and in that capacity had responsibility for the organisation of the annual European Transport Conference. Since 2006, Tom has organised and chaired Modelling World.

Tom Worsley CBE

4.14 Tom Worsley has been a Visiting Fellow in Transport Policy at the Institute for Transport Studies (ITS), University of Leeds since 2011, when he retired from the Department for Transport. During his career at the DfT, he was responsible for managing the team that developed the first versions of the National Transport Model and for the establishment of the WebTAG appraisal methodology. He also held senior level posts overseeing the Department's teams responsible for rail modelling and analysis, for the appraisal of local transport investment and for economic advice on aviation and the environment.

4.15 He was Specialist Advisor to the Economic Affairs Committee for their inquiry into the Economic Case for HS2 and to the Treasury Committee between 2015 and 2017. He has carried out research on the interface between transport appraisal and policy and has co-authored a number of reports and research papers on the subject. He has acted as a consultant to TfL and has contributed to the OECD's work on the relationship between transport investment and economic development.

5. Terms of Reference

Aim

5.1 The Joint Analysis Development Panel (JADP) provides strategic advice and challenge on the Department for Transport's approach to developing its transport modelling, appraisal and evaluation guidance and methods.

5.2 The panel is jointly chaired by DfT's Chief Analyst, Amanda Rowlatt, and Peter Jones, Professor of Transport and Sustainable Development, University College London. It brings together academic and professional experts with senior departmental analysts.

Remit

5.3 The panel, which meets around five times a year, will be asked to discuss the overall direction and technical merit of the Department's transport modelling, appraisal and evaluation methods. In addition, the group may choose to focus on specific areas for discussion which will be agreed before each meeting.

5.4 The panel has been established to help identify priorities in relation to our analytical strategies and will provide strategic level comment and recommendations. It is not intended to replace the more focused peer review we subject our analysis and research to on a regular basis. We will continue to hold engagement events on topic areas where we look forward to maintaining close and productive working relationships with all our stakeholders.

5.5 Looking ahead, our ambition is that JADP plays a key role in ensuring DfT's appraisal, modelling and evaluation methods continue to represent international best practice by providing constructive challenge and encouraging fresh, innovative thinking. Over the coming year the panel will be invited to add fresh perspective and challenge on delivery of the strategy and a variety of other topics which are likely to include National Transport Model Development, Travel Demand and Uncertainty.

5.6 Members generously give their time free of charge to attend meetings. They may, however, be asked to provide further input in terms of preparation of papers and/or presentations for meetings and subsequent follow up on topics for which they will be reimbursed at their daily rate, upon completion of satisfactory deliverables. Any additional work undertaken by individual members in response to requests from DfT will be optional: the availability/willingness to undertake additional work is not a requirement of being on the panel.

5.7 The panel will not be discussing details of research specifications or work that is imminently going out to tender.

Membership

5.8 The panel consists of a number of external members including the co-chair. These are senior professionals with a range of expertise, skills and experience and an ability to take a strategic view of Departmental issues.

5.9 All members (including the co-chair) are expected to abide by the seven principles of public life (Nolan Principles, attached at Annex A). They will also need to complete and sign a Declaration of Interests (see Annex B) and update as appropriate. The Register will be held by DfT and not shared with third parties.

5.10 The group includes a number of DfT senior analysts, with the DfT's Chief Analyst who jointly chairs the panel with Professor Peter Jones.

5.11 Given the range of issues the panel will be invited to discuss, the core group will be supported by a wider network of subject matter experts who will be invited to attend meetings as appropriate.

Contact details
TASM@dft.gov.uk

Annex A: Advice on Road Traffic Forecasts 2018

A.1   As an external member of DfT's Joint Analysis Development Panel, Glenn Lyons provided detailed advice and comment on an early draft of the Road Traffic Forecasts 2018 (RTF18) ahead of publication of the final report. The advice specifically focused around the question "To what extent do the proposed scenarios and resulting forecasts capture the great uncertainty associated with the trajectory of future traffic demand". Below is a short summary of that advice and DfT's response.

A.2   Glenn welcomed the approach to forecasting without a 'most likely' scenario, the efforts made to be transparent in the examination of past performance and the inclusion of an assessment of the potential impacts of emerging technologies such as Connected Autonomous Vehicles (CAVs).

A.3   Glenn considered that the scenarios in the report "constitute a reasonable 'opening out' of uncertainty" and was reassured that population growth uncertainty had been included. However, he expressed concern that "compound uncertainty in inputs that would lean towards lower levels of plausible future traffic growth have not been considered". In response, DfT clarified that the intention of the scenario building process was to develop scenarios that would improve both our understanding of the impacts of key uncertainties on future travel demand and the robustness of business cases, such as RIS2, without being driven by the outputs.

A.4   For the scenarios to explore the uncertainties around travel demand, it has been determined that limiting the number of variables varied in any one scenario allows the department to communicate the impacts of specific variables on road traffic demand. It should be noted that DfT have not combined assumptions specifically to drive a 'high' traffic forecast (e.g. high population growth, low fuel costs, high GDP and increased trip rates). It is recognised that there are different combinations of assumptions which could produce different scenarios and we will review the set of scenarios used for the next RTF publication.

A.5   It was noted in the advice, in relation to Connected Autonomous Vehicles (CAVs) that "to assume only a single fleet penetration trajectory given the deep uncertainty associated with CAVs I find troublesome and indeed at risk of being misleading". The report was re-drafted to be clear that the technology tests completed were not intended to represent high, central or low demand scenarios. The 'what if' nature of the technology tests was strongly emphasised, highlighting the limited amount of evidence and the exploratory nature of the analysis. Whilst the report still only considers a single uptake rate of CAVs, it has been stated that all the RTF18 scenarios effectively explored futures where there is zero uptake as CAVs.

A.6   Glenn considered the report "to embrace uncertainty well" when its commentary and quantitative modelling were considered together, and encouraged DfT to further address the risk of readers being drawn to the quantitative modelling only.