Joint Analysis Development Panel
Annual Report 2019-20

Moving Britain Ahead

Contents

Foreword

The Joint Analysis Development Panel has continued to be at the forefront of shaping the analytical agenda this year, with members steering and influencing the delivery of priorities in our Appraisal and Modelling Strategy. Topics have included rebalancing the economy, reflecting uncertainty in appraisal, the development of modelling tools to support appraisal and, more recently, the Green Book review and environmental impact appraisal.

The panel is a key element of our external engagement and this year we fulfilled our ambition to enhance and develop its role by inviting applications from academia and the practitioner community to join the panel, appointing four new members to join the existing seven. While delivering the ambitions in our Appraisal and Modelling Strategy will continue to be a focus for the panel, the agenda for 2020-21 will be shaped by ongoing national and global events and their implications for appraisal and modelling.

I would like to thank all the panel members for their fresh thinking and constructive challenge, with particular thanks to my esteemed co-chair Peter Jones for his joint leadership of the panel.

Amanda Rowlatt, Chief Analyst

The DfT has faced a growing number of policy and analytical challenges over the past year, and the Panel has sought to play a supporting role by providing an external sounding board, a compass and a constructive source of challenge. This Annual Report well illustrates the breadth and depth of our deliberations. With the encouragement of JADP, the department has placed an increasing emphasis on external engagement with professional communities, which has increased mutual understanding and has shown strong benefits for both parties.

The work of JADP has been greatly enriched by the appointment of four new panel members at the start of 2020, adding to the range and depth of experience in our debates. This makes JADP well placed to advise the department in the coming year on issues of national importance, in particular the levelling up agenda, decarbonisation and the longer-term impacts of COVID-19.

The Panel has been able to operate efficiently and effectively due both to the personal commitment of its members and to the openness and support from colleagues from many parts of DfT. I would like to thank them all for their constructive contributions and, in particular, my co-chair Amanda Rowlatt, for her leadership and support.

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

Executive summary

1 Last year, following an extensive consultation exercise, we published our Appraisal and Modelling Strategy setting out priorities for supporting the delivery of proportionate analysis and developing the evidence base to inform the critical investment decisions that will be made over the next five years. Working collaboratively with partners and stakeholders is at the heart of the strategy.

2 The Joint Analysis Development Panel is a key element of our external engagement and provides academic and practitioner insights and challenge on a wide variety of modelling and appraisal issues. This year we have fulfilled our ambition to strengthen the role and expertise of the panel by inviting applications from those in academia and the practitioner community to join the panel. We were delighted to welcome four new panel members to join the seven existing members from January 2020.

3 The panel has continued to be at the forefront of shaping the analytical agenda over the past year, with a focus on the delivery of priorities within the Appraisal and Modelling Strategy. Topics have included reflecting uncertainty in appraisal, housing and transport analysis, the value of time in congested conditions and national-level modelling developments. During the second half of the year the agenda has reflected the changing emphasis on government priorities with discussions on rebalancing the economy, environmental impact appraisal and HM Treasury's Green Book Review.

4 Our discussions with the panel have helped to steer the delivery of key themes in the Appraisal and Modelling Strategy, expose challenges and uncertainties with developing and presenting our work and ultimately helped us to build more confidence in our modelling and appraisal methods. Looking ahead, the panel's advice will be invaluable as we reflect on how appraisal and modelling can support ambitious objectives such as decarbonisation and levelling up while adapting to accommodate the huge uncertainty created by the COVID-19 pandemic.

5 This annual report summarises the panel's discussions over the course of the year and is published in the interests of transparency. We continue to be very grateful to all our panel members for providing their time free of charge and for the subject matter experts who have shared their expertise at specific meetings.

1. Introduction

Background

1.1 It is vital that we have a robust understanding of the wide-ranging impacts that transport investment has so that the best investment decisions can be made. Our appraisal framework aims to provide as full a view as possible about the wide range of impacts transport has on the economy, environment and society. Our guidance on how to conduct transport appraisals, TAG[1], draws on best practice in government, academia and industry and we aim to ensure that it reflects the latest evidence and appraisal methodologies.

1.2 Last year we published our Appraisal and Modelling Strategy[2] following an extensive consultation exercise. The aim of the strategy is to provide robust, flexible and easy to use modelling and appraisal tools that can be used to inform the critical policy decisions which will be made over the next five years. Working collaboratively with our partners and stakeholders to support the delivery of proportionate analysis and encourage innovation as we continue to develop the evidence base, methods and data for appraisal is at the heart of the strategy.

1.3 The Joint Analysis Development Panel (JADP) forms a core component of our academic and professional engagement, providing academic and practitioner insights and challenge on DfT's modelling and appraisal methods. The panel was established in 2015 and following a public appointments exercise last year there are now eleven external members.

1.4 We endeavour to work closely with all our stakeholders and over the past year have held a well-attended launch event for the Appraisal and Modelling Strategy in Manchester, presenting topics from the programme at various conferences (including Modelling World and the European Transport Conference) and hosted topic-focused workshops including on base year matrix building, landscape values, level three impacts and ecosystem services. Alongside this we have been committed to routine engagement and collaborated with key partners on research and data sharing.

Membership

1.5 JADP brings together academic and professional experts with senior departmental analysts and is co-chaired by DfT's Chief Analyst, Amanda Rowlatt, and Professor Peter Jones, University College London.

1.6 This year we invited applications from across academia and the practitioner community to strengthen and broaden the expertise of the panel. We are delighted to appoint the following members for a three year period commencing January 2020:

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[1] Transport Analysis Guidance https://www.gov.uk/guidance/transport-analysis-guidance-webtag
[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/795924/appraisal-and-modelling-strategy.pdf

- Peter Jones, Professor of Transport and Sustainable Development, Centre for Transport Studies (CTS), University College London. Co-chair of JADP.

- Richard Batley, Professor of Transport Demand and Valuation, Institute for Transport Studies (ITS), University of Leeds

- Helen Bowkett, Senior Technical Director, Arcadis and Visiting Professor, University of the West of England

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

- Glenn Lyons, Mott MacDonald Professor of Future Mobility, University of the West of England and Mott MacDonald

- Charlene Rohr, Senior Research Leader, RAND Europe

- Elaine Seagriff, Director, Transport Planning, Jacobs

- Anthony Venables, Professor of Economics, Oxford University

- Tom van Vuren[3], Technical Director, Mott MacDonald

- Bryan Whittaker, Director, Transport Modelling, WSP

- Tom Worsley, Visiting Fellow in Transport Policy, ITS Leeds

1.7 The panel is supported by a broader network of subject matter experts who are invited to attend meetings on specific issues.

Format of meetings

1.8 The panel has met five times over the course of the year, including a working dinner and all day workshop at Oxford University in January. Meetings are normally structured around two or three substantive topics with departmental analysts presenting papers for discussion posing key analytical questions. The panel is often joined by additional subject matter experts who have detailed knowledge of specific topics.

1.9 Topics have been selected on the basis of DfT's priorities and suggestions from panel members. This year the focus has been on topics within the Appraisal and Modelling Strategy themes[4] with a focus in the second half of the year on wider changes in the appraisal environment.

1.10 The full list of topics for 2019/20 were:

- People centred analysis case studies

- Uncertainty

- Housing and transport analysis

- National Transport Model development

- Future of the National Trip End Model

- Draft TAG conference programme

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[3] Tom is currently on secondment in Australia and due to return to the UK spring 2020.
[4] People and place; reflecting uncertainty; modelling and appraising transformational investments and housing; supporting the application of TAG and developing modelling and appraisal tools to meet user needs.

- Congested values of time
- Connected autonomous vehicle estimation (CAVE) project
- Appraising strategies, visions and missions
- Rebalancing
- Transport and the environment
- Green Book review
- Distributional weights

1.11 The following sections summarise the discussion at each meeting, outline next steps and provide further background on panel members.

2. Summary of Meetings

Introduction

2.1   This section summarises the topics and discussions of the panel over the past year. All meetings were held in Windsor House, Victoria Street, London with the exception of the all day workshop held at Oxford University.

Summary of discussion at 7th May meeting

2.2   Topics for discussion at this meeting were: People-centred analysis case studies, Housing and transport analysis update and the Future of the National Trip End Model. The panel was joined by Helen Bowkett (Arcadis), Neil Chadwick (Steer) and Charlene Rohr (RAND Europe).

People-centred analysis case studies

2.3   The panel was presented with an overview of analysis and case studies developed to provide a richer picture of the impacts of transport investment on different groups of people. This included:

- Producing metrics that provide impacts at a more granular level, for example, travel times and changes in the number and cost of trips;

- An enhanced approach to distributional analysis;

- Greater use of maps and alternative forms of presentation to make the results more relevant and relatable.

2.4   The panel was asked for a steer on how well the case studies provide an insight into the impacts of schemes on individuals, views on metrics and barriers to widespread adoption.

2.5   The panel noted the potential value of this more detailed analysis in informing scheme design and helping to foster better communication between different professions. It was suggested that the work may more naturally align with the strategic case and might help to give prominence to social and distributional impacts from an early stage.

2.6   However, the panel cautioned that there are associated policy and analytical risks. Potential issues raised by the panel included the use and interpretation of metrics by different audiences and whether metrics might selectively be presented to fit the narrative at hand. The panel agreed that precise terminology would be needed and it would be important to be clear about which metrics are new and not currently reported, for example, isolation and social cohesion. It was suggested that the visualisation of analysis should be separated from the metrics being analysed.

Uncertainty

2.7 DfT presented an overview on the Appraisal and Modelling Strategy theme of uncertainty. A key commitment in the strategy is an uncertainty toolkit which is being scoped. There is also an ongoing scenarios pilot testing the impact of a common set of DfT scenarios. These provide a consistent and cross modal set of scenarios for the appraisal of schemes across the portfolio. Five scenarios have been developed covering economic, demographic, behavioural and technological uncertainties to be tested on a number of major schemes. The resource and time cost associated with scenarios has been a key challenge. It was recognised that budgets may need to be increased, reprioritised or a more proportionate approach adopted for smaller schemes.

2.8 The panel was asked for views on taking forward the use of scenarios in appraisal and how far the initial scope of the uncertainty toolkit would meet stakeholder requirements.

2.9 The panel discussed some of the issues with implementing this work including conveying proportionality when implementing the toolkit and the importance of further engagement with stakeholders. It was suggested that "pathways" could be used to guide practitioners through the process of identifying and addressing uncertainty depending on the characteristics of their scheme.

2.10 It was noted that there's a need for a clear definition between sensitivity tests and scenarios and consideration of which approach is most appropriate in each circumstance. It was suggested that scenarios are a combination of different variables changing with an overarching narrative whereas sensitivity tests normally involve one variable changing at a time.

2.11 It was suggested that thinking about uncertainty differs as business cases progress. At the strategic outline business case stage, scenario testing might be most relevant. At the outline business case stage sensitivity tests become more important and at the final business case stage the focus might be on risks of delivery and cost overruns. The potential cost and time implications of scenario analysis were discussed and it was noted that the complexity of transport modelling means a simpler strategic model may be needed.

2.12 The panel discussed how scenarios could be used, noting that an important use could be to test the resilience of DfT's portfolio. At a local level, there can be a tension between having common scenarios and consistency while meeting different aspirations of local areas. The panel agreed that case studies to demonstrate best practice would be useful and should not necessarily be limited to past transport schemes.

2.13 Following the scenarios pilot and the need to better understand uncertainty in light of COVID-19 impacts, the common set of DfT scenarios are being reviewed.

Summary of discussion at 2nd July meeting

2.14 Topics for discussion at this meeting were: Housing and transport analysis update, National Transport Model development, the Future of the National Trip End Model and the draft TAG conference programme. The panel was joined by Lynda Addison (CIHT), Jon Parker (Integrated Transport Planning) and Elena Golovenko (Jacobs).

Housing and Transport Analysis Update

2.15 DfT presented a paper on their housing and transport analytical programme which covers the assessment of housing impacts in the appraisal of strategic transport schemes and alignment of DfT and MHCLG appraisal processes.

2.16 It was noted that DfT and MHCLG have different primary objectives which is reflected in appraisal guidance. Appraisal of programmes like the Housing Infrastructure Fund[5] uses both MHCLG and DfT guidance. TAG guidance is used to understand the impact of housing on existing transport users with dependent development guidance being used to understand whether the housing development is dependent on the transport scheme. MHCLG has broad level guidance on the additionality of schemes and refers to TAG and transport modelling where proportionate for a development scheme.

2.17 A number of issues were raised around the planning of housing and transport which were felt to create barriers to developing sustainable communities. These included a current lack of strategic regional planning, limited availability of multi-modal models and resourcing constraints which can make it hard for Local Authorities to develop evidence. It was also commented there is a need for transport planning to influence the development earlier in the planning process and to better align with town and country planning. It was suggested that clearer DfT guidance on transport planning for new developments could help LAs to support and shape thinking on future sustainable transport.

2.18 It was noted that more evidence is needed to develop the analytical basis for transport planning and for appraisal. There was a recognition that the models used are seen as 'black boxes' and require specific technical skills. One participant suggested Local Plan reviews often start with defending the model that has been used rather than the objectives of the plan. Data availability can be low and there are gaps such as costs of facilitating infrastructure (building hospitals and schools) and local trip rates data. It was noted that a proportionate approach is required and a starting point could be to identify common behaviours to include in the modelling.

2.19 It was suggested that case studies could be helpful in demonstrating what works in terms of sustainable transport and housing planning. Issues of providing an evidence base for sustainable transport can be an issue for LAs.

2.20 It was suggested that a critical realism approach, which could be explored through agent based simulation, might allow exploration of what is meant by "sustainable community"? For example, a given set of rules that define certain activities or a given choice set would result in a given version of a sustainable community. One person's view of sustainable community could be vastly different from another. Exploring this would in turn allow exploration of the potential for developing different sustainable communities.

National Transport Model Development

2.21 DfT presented an update on the development of a new National Transport Model (NTMv5) which has much greater geographic detail than the current version and includes 7,000 zones.

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[5] https://www.gov.uk/government/publications/housing-infrastructure-fund

2.22 The modelling team proposed moving forward on a 3-point scale: development, adaptation and adjustment. A number of modelling challenges had been identified: freight demand, Connected and Autonomous Vehicles, Electric Vehicles, Clean Air Zones, Land use change. The panel was asked for a steer on the relative importance and whether there were other future challenges DfT should be considering as priorities for developing the new model further.

2.23 The panel cautioned against focusing development on future technologies that are not yet proven at the expense of ongoing trends such as localised increased walking and cycling and suppressed travel due to digital trends.

2.24 It was noted that the diversity of modes is increasing with rising numbers of E-bikes, E-scooters and powered skateboards and the NTM will need to be able to reconcile these. It was questioned whether proxy approaches with slight adjustments will be sufficient. It was agreed that the ability to capture different ways of paying for transport would be useful too. It was agreed that the team should continue to talk to owners of regional models to share best practice.

Future of the National Trip End Model

2.25 DfT presented preliminary thinking on the future of the National Trip End Model (NTEM). The presentation noted that NTEM is a key part of the model system. As data sources have evolved, issues have been raised around the relevant data inputs for models at different scales. The planned review of the model was driven partly by governance and partly by model performance issues.

2.26 The panel agreed that how NTEM deals with uncertainty should be a priority, including how cohorts are forecast to behave over time and potentially moving away from a core population projection. It also suggested that the review should consider how NTEM forecasts are applied and used in development plans and interpreted by planning inspectors, supporting the proposal that the review not be limited to the technical side.

2.27 It was suggested that DfT explore whether an NTEMlite could be developed to help explore different scenarios and 'what-ifs'.

Draft TAG conference programme

2.28 The panel was presented with a draft programme for the first TAG conference due to be held in the autumn. The emphasis of the conference would be on sharing best practice and research and encouraging collaboration to deliver priorities in the Appraisal and Modelling Strategy.

2.29 Panel members made a number of suggestions including sessions for young professionals, reviewing national down to sub-national approaches to appraisal, reviewing and comparing approaches to air quality modelling, practitioner uses of guidance and bringing in international counterparts, for example, the Dutch Ministry.

Summary of discussion at 15th October meeting

2.30 Topics for discussion at this meeting were congested values of time, the Connected Autonomous Vehicle Estimation (CAVE) project and the Appraisal and Modelling Strategy.

Congested values of time

2.31 DfT presented the outcomes of an initial feasibility study, completed in 2018, on congestion dependent values of time in transport modelling, including discussing plans for further work. The UK 2014-15 Value of Travel Time Savings (VTTS) study recommended the use of congested values of travel time (CVTT) and as a first step towards this the Department had decided to undertake a review of the robustness of the underlying values and the implications for modelling and appraisal. The 2018-19 feasibility study[6] sense-checked the values from the 2015 study via a meta-analysis of UK and other European studies. The meta-analysis found congested value of time multipliers that tended to be lower than those found in the 2015 study. Most studies found highly statistically significant multipliers, which reflect the difference in values of time between congested and free-flow traffic conditions.

2.32 The report also considered proposed approaches and practical solutions to this and how this would have to differ depending on the modelling approach. A follow-on report tested the feasibility of introducing congested values of time by applying a range of indicative CVTT multipliers to a large-scale case study using a real-life strategic model (PRISM). The study also used a hypothetical case study which aimed to maximise the congestion effects to stress-test the impacts of multipliers 1, 3 and 5. The net effect for the schemes was a positive impact on the benefits estimated. The additions to the model were successfully calibrated and validated and had limited effects on model run times or convergence.

2.33 The panel noted that the study provides a conceptual framework with lots of moving parts. There are implications of including congested values of time which run throughout the system - including assignment, demand and appraisal - and there is a risk to their application. The panel recommended that testing should include other transport modelling software platforms such as SATURN.

2.34 It was also suggested that a greater understanding is needed of the psychology when people are stuck in traffic. Similarly, that there is a distinction between delay and quality. Careful consideration should be given to what is being captured in stated preference exercises.

2.35 The panel asked about the read across to rail values where there are both typical values and crowding multipliers. Car passenger occupancy should also be a key consideration. It was suggested that DfT considers the car passenger and whether they experience the same disbenefits as the driver and what that might imply for the calibration of the transport model and trip making patterns.

2.36 While the work to date has shown there is a strong case for accounting for CVTT in appraisal, and that it is practically feasible to do so, there remain significant uncertainties around how they could be robustly implemented in TAG. Therefore, following the discussion with JADP we are planning to carry out further work to inform the potential adoption of CVTT into TAG. This includes an independent peer review of the feasibility study and follow-on work, as well as a possible valuation study to derive a set of multipliers in the appropriate functional form for both modelling and appraisal.

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[6]
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/824172/Congestion_dependent_values_of_time_in_transport_modelling.pdf

Connected Autonomous Vehicle Estimation (CAVE) project

2.37 DfT presented the Connected Autonomous Vehicle Estimation Project which aims to model and forecast the impact of CAVs on the transport network. The project emerged from the technological scenarios work in the Road Traffic Forecasts[7]. The lack of any historic data has led to a different approach being adopted: a systems thinking and systems dynamic approach.

2.38 In the long term, the project may be used to inform scenario creation. The current model takes in National Trip End Model data and current mode splits and tries to project them forward. It uses socio-demographic factors to estimate the propensity of using a CAV by capturing the impact of technological take up from seeing the technology in action. DfT noted that it had also started thinking about the diversity of AVs and how the potential business models of AVs will result in mode choice such as taxis or ownership of AVs. It was emphasised that the work was at a very early stage using an agile approach to answer 'what-if' questions. There are implications for preparatory regulation as well as modelling and appraisal.

2.39 The panel raised the importance of considering not only the demand side but also the supply side. It was noted that assumptions on ownership will be important, taking into account vehicle leasing trends and car clubs.

2.40 It was also suggested that the project should more explicitly consider the level of CAVs including whether full autonomy is assumed. Similarly, the issue of whether pedestrians and cyclists might behave differently if they believed CAVs would avoid collisions was raised including whether road infrastructure might need to be redesigned to realise some of the potential benefits of CAVs.

2.41 It was suggested that the experience of cab sharing currently may be an indication of consumer resistance to sharing. It was also noted that there may also be gender differences with women potentially less likely to ride-share. Consideration of those who do not currently use the system should be factored in, for example, those who cannot drive or have given up driving which might increase the number of trips on the network in an AV world.

2.42 The importance of considering the project in the space of 'system of systems thinking' was noted, as this would include consideration of knock-on effects including health impacts and infrastructure design. Another suggestion was that agent based modelling could be more suitable to answer some of the questions around impacts and behaviour.

2.43 The modelling has progressed within DfT and has been showcased at this year's Data Science in Transport Conference. On the recommendation of JADP, the assumptions of using socio-demographic factors to model the initial propensity to use the technology have been reviewed and instead they are now used determine the type of CAV utilised, better reflecting current understanding. JADP reflections on those who currently do not use the transport network but may do in an AV future has been incorporated in the model's trip demand.

Appraisal and Modelling Strategy

2.44 DfT gave a short update on the Appraisal and Modelling Strategy. DfT had held a well-attended launch event for the strategy in July which had indicated a high level of

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7 https://www.gov.uk/government/publications/road-traffic-forecasts-2018

support for collaborating. One example being pursued is sharing data with Transport for the North which should lead to cost savings across the industry. Progress is being made across all themes in the strategy including landscape values, optimism bias, agglomeration elasticities, freight and TAG accessibility.

2.45 The panel commented that freight is a big issue and some of the data constraints were discussed in relation to both freight and LGVs. The panel also questioned whether the ambition for the UK to be carbon neutral from 2050 was fully reflected in appraisal. DfT noted that it had undertaken some sensitivity testing which indicated results are not very sensitive to carbon shadow prices.

Summary of all day workshop on Friday 24th January

2.46 The panel's annual dinner and all day workshop was held in Oxford on Friday 24th January. Professor Tony Venables hosted the panel in the Economics Department of Oxford University. The panel was joined by Tim Foster, Head of Economic Advice, Transport for the North and Sarah Rae, Assistant Director, National Infrastructure Commission. The workshop provided an opportunity to reflect on some of the wider changes in the appraisal environment over the year and included discussions on appraising strategies, visions and missions, rebalancing and transport and the environment.

Appraising Strategies, Visions and Missions

2.47 The first paper discussed the pressures on cost benefit analysis resulting from policies increasingly being defined in terms of strategies, visions and missions and outlined a range of methods, tools and metrics that could be used to supplement CBA. It was noted that many of the issues were drivers for the 2018 consultation on DfT's Appraisal and Modelling Strategy that was published in April 2019.

2.48 The panel concluded that CBA, if carried out fully in accordance with TAG, would work well for the majority of transport schemes assessed and will continue to be integral to decision making. It was agreed, however, that other tools could potentially be used to strengthen and supplement the decision-making process. Consistency between tools within the framework is important.

2.49 It was agreed that there is a challenge around the knowledge required to write a strategic case. The skillsets of the authors of the strategic and economic cases often differ and the panel felt there was a tendency for strategic cases to potentially end up being 'window dressing' for the economic case. A clear strategy or vision is essential to building a strong strategic case.

2.50 Several panel members noted that there is a clear need to link up thinking done at early stages – policy and strategy development needs to be linked to early-stage analytical thinking. The strongest support was for tools that can be used in the early stages to help define the issues/problems/linkages, inform option generation and prioritisation and scope what analysis is needed.

2.51 There was widespread support within the group for considering the potential role of systems thinking where the investment is 'transformational' and/or involves different sectors. Some members felt systems thinking could help people make connections, draw issues to the surface and, through its participatory nature, help build consensus. It could also be used to increase consistency between the strategic and

economic cases. Systems dynamics models are also being used to capture system-level behaviour though views were mixed on their application.

2.52 Some panel members noted that agent-based modelling is able to capture behaviours and policies that traditional modelling cannot and some felt this ability would become increasingly important given uncertainties over future travel behaviour. Others expressed concern about the foundations of these models.

2.53 Other tools discussed which could be useful included Multi Criteria Decision Analysis and real options analysis/decision trees. It was felt that decision trees could be useful in presenting the consequences of decisions and points of no return but there was not enough discussion/experience of these across the groups to draw firm conclusions.

2.54 The panel agreed that scenarios need to play a key role and can be used both as part of vision development and testing the robustness and resilience of options against different futures.

2.55 It was noted that we may be moving to a non-welfare maximising environment:

- In a world of targets, visions and missions, cost-effectiveness may be used alongside CBA to indicate the clearest path to achieving goals.

- Similarly, the 'best' intervention may be the one that is robust to as many futures as possible which is not necessarily the central case welfare-maximising option.

2.56 Many of the issues raised – particularly in relation to early analysis - are already covered in TAG and strategic case guidance (which suggests plotting out where an intervention fits into the system). This highlights the need for greater (and more effective) communication of the guidance that already exists.

Rebalancing

2.57 DfT began by noting that this is one of the priority areas in DfT's Appraisal and Modelling Strategy. DfT's current priority is to emphasise the flexibility in TAG and focus on the commitments in AMS, however, the panel was asked for a steer on whether this is enough to reflect the prominence of the rebalancing agenda and what else should be included in the medium term.

2.58 The panel agreed that rebalancing and levelling up need to be defined if we are to assess transport's role in meeting objectives in this area. Linked to this, the panel discussed the metrics and indicators that could be used to develop the narrative around transport's role in levelling up.

2.59 There was an emphasis in discussions on understanding what a scheme is seeking to achieve, clearly setting out the theory of change and the mechanisms through which local economic impacts are transmitted. There was a clear steer that understanding the local economic context is fundamental to building a strong case for investment and on balance this was seen as a higher priority than further modelling. Good local data is key – including granular understanding of housing and employment markets - and qualitative surveys were also recommended.

2.60 Case studies were seen as important though a potential issue was noted if schemes compare themselves to others that have been funded. It was noted that a lack of long term evaluation in this area means there is a gap in our understanding of what has or has not worked and why.

2.61 Displacement is a key Green Book assumption which was challenged by some. It was argued that labour markets have shown themselves to be resilient to increased female participation and migration. It was also suggested that displacement discussions can lead to an unhelpful focus on binary winners and losers whereas the reality is likely to be much more nuanced.

2.62 It was suggested that it would be very challenging to devise distributional weights due to the uncertainty over who gains (or loses) from second order impacts arising from large scale investments (e.g. impact on house prices). It was suggested instead that accessibility metrics are given greater prominence, including who is getting greater access to opportunities from better transport (with a focus on buses and potentially new modes such as electric scooters).

2.63 It was suggested that DfT could be more positive in guidance about looking at alternative local forecasts though concerns around rigour and consistency were noted.

Transport and the Environment

2.64 The final paper for the day focused on the environment. It set out the approach embedded in current guidance for environmental impact appraisal, how various stakeholders have challenged this approach in recent years and summarised a selection of additional approaches for consideration.

2.65 Discussion noted that a wide range of environmental issues are already included in appraisal such as landscape, noise, air quality and carbon. The focus, however, was on carbon, including embedded carbon from transport infrastructure.

2.66 The use of marginal abatement costs for carbon was questioned by a number of panel members and there was discussion about the level of the actual (as distinct from shadow) price, how it is scheduled to rise in future years and whether it incentivises decarbonisation quickly enough.

2.67 Cost effectiveness is widely used in government to assess the most cost effective way for sectors to meet carbon targets. There was discussion over whether this approach could be used alongside CBA.

2.68 There was some discussion whether carbon impacts should be considered outside of the economic case given that most transport investments are separately likely to have a relatively modest impact on carbon relative to the benefits, but the combined effect of many projects would not be marginal. One option suggested would be to highlight carbon impacts in the strategic case, another would be to make changes to the decision-making process such as the use of MCDA using decarbonisation as a filtering tool at options generation stages when comparing schemes.

2.69 It was agreed that there is huge uncertainty in this area: the rate of technological uptake is unclear and hard to model and there is not a clear view on either the carbon tipping point or the impacts climate change will have. There's also uncertainty over urbanisation and other behavioural trends.

Summary of 31st March meeting

2.70 This meeting was held virtually due to COVID-19. Topics included the Green Book review and distributional weights. We were joined by colleagues from HM Treasury who were keen to engage the panel on the Green Book review.

Green Book Review

2.71 HM Treasury introduced the first paper on the Green Book Review. The review will be focused on levelling up and in addition to addressing criticisms that the Green Book approach to appraisal biases decisions in favour of London and the South East, it will also investigate how the Green Book is applied, perceptions of what it contains, the practicalities of how it's communicated, its role in the decision-making process and finally the quality of the Green Book training. The panel was presented with a summary of the main criticisms of the Green Book and asked for views on whether these were comprehensive and which should be prioritised during the review. It was noted that the definition of levelling up has not yet been formalised.

2.72 The panel agreed that the criticisms presented were generally comprehensive although uncertainty was raised as a potential omission. As models are required to capture an ever-increasing set of relationships ultimately this will increase uncertainty in estimates. It was also suggested that more thinking on the sources of the criticisms and whether they are valid could be useful, for example, to what extent is there a Matthew Effect or London bias?

2.73 A number of panel members questioned whether changing the Green Book is the starting point to achieve levelling up. Some suggested that levelling up is a strategic question while the Green Book is an operational tool.

2.74 It was suggested that there is a need to define what the problem is and identify the feedback loops that lead to low-level equilibria such as low skills, location of industries and a low tax base, to think cross-sector about what package of measures would result in transformative impacts and to create scenarios of what might truly be transformative. This may require a departure from current methods in the Green Book.

2.75 The panel emphasised the need for supplementary economic or cross-sector models to demonstrate some of the complementarities and interactions between projects. These should be explored at the strategic level to ensure complementary investment is planned for. It was agreed that a greater focus is needed on the interaction between transport investment and land use.

2.76 A number of panel members suggested that displacement should be revisited given that it works through a number of different mechanisms. It was also noted that there is a significant time lag which needs to be addressed when thinking about how policies are going to interact with transport.

2.77 There was discussion on how Benefit Cost Ratios (BCRs) are used in practice and whether they are being used to help rank projects within regions or allocate funds between regions and modes.

2.78 Some panel members noted there is an element of 'levelling up' already included in appraisal. Level 1 benefits such as values of time are for the most part driven by equity values. Level 2 benefits with agglomeration are regionally variant.

Distributional weights

2.79 DfT introduced some internal exploratory work to scope the application of distributional weights in appraisal. The Appraisal and Modelling Strategy had committed to examine the use of approaches such as distributional weights to better capture local economic impacts.

2.80 Distributional weights are factors that increase the monetary value of benefits or costs that accrue to lower income individuals or households. They are based on the principle that the value of an additional pound of income may be higher for a low-income recipient than a high-income recipient. Distributional weights offer an important insight over and above traditional distributional impacts analysis by presenting monetary values for estimates of the welfare impacts on different groups in society. The paper identified a number of options for how distributional weights could be included in appraisal and a number of challenges in applying weights.

2.81 A number of points were made in discussion regarding the impact distributional weights might have on the decision-making process. There was support for looking at case studies on a sample of schemes across modes and of different sizes to see how much of a difference distributional weights would have on the BCR and whether they would change the ranking of schemes by mode and region. It was suggested that this might reveal how much impacts such as agglomeration, that are spatially variant, have on the decision-making process already. It was also suggested that distributional weights might be attractive for testing certain policies such as buses or road pricing.

2.82 A number of comments were made regarding the practical challenges of applying distributional weights in traditional transport models. In particular, it was noted that it is hard to model and forecast income segmentation without household surveys. The increasing use of mobile phone data and other sources such as rail ticket data don't include household information. There is also a lack of information on the segmentation of trips on different road types.

2.83 Other practical challenges include the risk of misattribution of benefits and the risk of modelling behavioural responses incorrectly considering the interaction of behavioural values in models versus appraisal values.

3. Next steps

Changing appraisal environment

3.1 The final JADP meeting of 2019/20 was held virtually due to COVID-19 and we expect to continue with virtual meetings over the coming months. The themes and topics in the Appraisal and Modelling Strategy will continue to be a focus for the panel in 2020/21, however, the agenda will be influenced by ongoing national and global events and their implications for Transport Analysis Guidance (TAG). These issues are described in detail in the TAG Route Map[8] and include the COVID-19 pandemic, the Transport Decarbonisation Plan[9], the levelling up agenda and Green Book review.

3.2 The Route Map sets out a strategic approach to change management over the coming year to enable these and other interlinked issues to be considered in the round. The aim is to provide a consolidated update to TAG at an appropriate time, balancing the risk of disruption to ongoing analytical work with having the best available evidence to support decision-making

3.3 The panel's academic and practitioner insights and challenge will once again be invaluable as we reflect on how appraisal and modelling can support ambitious objectives for decarbonisation and levelling up while adapting to accommodate the huge uncertainty created by the COVID-19 pandemic.

Continuing engagement with all our stakeholders

Close engagement with all our stakeholders will continue to be a priority as we work together to address the challenges set out in the Route Map and continue to progress the AMS programme. We intend to hold a series of digital events in the autumn to share progress and emerging evidence.

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[8] Insert link to TAG Route Map
[9] https://www.gov.uk/government/publications/creating-the-transport-decarbonisation-plan

4. Biographies

Peter Jones OBE

4.1 Peter Jones is Professor of Transport and Sustainable Development, in the Centre for Transport Studies at UCL. He is a member of the Independent Transport Commission, the DfT's Science Advisory Council and co-chair of its Joint Analysis Development Panel. He is a member of the City of London Transport Strategy Board, the South-East Wales Transport Commission, the Dubai Council for Future Transportation, the Hong Kong ERP Advisory Panel and the CIHT Urban Design Panel. He is Scientific Co-ordinator for the EU funded project 'MORE', on optimum design and operation of road-space on main urban roads; and also leads on two ESRC projects, on Sustainable Urban Mobility transitions on Africa, and governance issues around the introduction of automated vehicles in the UK.

4.2 He advises the European Commission and a number of major cities and national governments around the world, and was awarded an OBE for services to national transport policy, in January 2017. He has a wide range of transport research and teaching interests, covering both analytical methods and policy. These include transport policy, traveller attitudes and behaviour, travel trends and the determinants of travel demand, traffic restraint studies, accessibility studies, policy option generation, major transport economic and social impact studies, public engagement, development of new survey and appraisal methods, and advances in urban street planning and design. Recent research has addressed issues around futures and the changing requirements for forecasting and appraisal.

Richard Batley

4.3 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.

4.4 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.

Helen Bowkett

4.5   Helen Bowkett is a transport planner who has spent the last 40 years working on the planning and appraisal of changes to the transport network across walk, cycle, bus, rail and road modes. Over this time she has worked for consultancies, local and central government. She trained as a transport economist but also builds many of the multi-modal transport models which provide inputs into the economic appraisal of schemes. Her work is often focussed on multi-disciplinary approaches to the planning of areas such as London Docklands and Kent Thames-side. This has provided her with useful insights into the role that transport plays in the long term transformation of places and the impacts of transport schemes on people, the environment and the economy.

4.6   While Head of Transport Evidence at the Welsh Government she was the main author of the significant 2017 revision to WelTAG, which sets out the transport appraisal process used in Wales. WelTAG emphasises the importance of a broad consideration of possible impacts of proposals and the need to build an evidence base on the impacts of transport schemes and policies, promoting an ethos of openness and continual learning. She completed a PhD recently which looked at modelling methods used in other disciplines and the value they could bring to transport modelling and appraisal. She is a visiting Professor at the University of the West of England where she teaches on modelling, economics and appraisal.

Phil Goodwin

4.7   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.

4.8   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

4.9   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.

4.10 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 former (2016-2020) Trustee of the Chartered Institution of Highways & Transportation and is a Trustee of the Rees Jeffreys Road Fund.

Charlene Rohr

4.11 Charlene Rohr is a Senior Research Leader at RAND Europe and Co-Director of RAND Europe's Centre for Futures and Foresight Studies. Ms Rohr received her B.Sc. in Civil Engineering and her M.Sc. in Transportation Engineering from the University of Alberta, Canada. She has over 25 years of experience in undertaking research to better understand factors that influence mobility and travel, including extensive expertise in transport demand modelling, futures analysis and policy analysis more generally.

4.12 Ms Rohr has substantial experience in developing large-scale travel demand forecasting models for urban, regional and national geographies in the UK, Scandinavia, Europe and Australia. She has also contributed to the design and analysis of Stated Preference surveys to explore travel behaviour and to value non-market goods. She has led a number of rapid evidence literature reviews, including for the UK Department for Transport to identify factors influencing the levelling off of car travel in Britain. Her work also explores the influence of technology on travel demand. In 2015-16 she led a study for Innovate UK to develop future scenarios for Britain for 2035 exploring the impact of emerging technologies, including autonomous vehicles, on travel. In 2017-2018 she led a study for the European Parliament to quantify the social and economic impacts of changes to the Product Liability Directive on roll-out of fully autonomous, or self-driving, vehicles. She has also undertaken policy studies to examine travel behaviour of concessionary pass holders to quantify costs and benefits of concessionary schemes and to quantify the impact of migration on transport infrastructure.

Elaine Seagriff

4.13 Elaine Seagriff is Director of Transport Planning with Jacobs, where she leads the UK national transport strategy and policy team to help shape strategic policy and transport planning in many regions. In this capacity she has been advising a number of the devolved transport authorities in the UK and overseas city regions on their transport strategy and policies and on integrated transport authority responsibilities and governance.

4.14 Prior to this, apart from a short time in the U.S. working on southern California's light rail strategy, Elaine has been a mainstay in London's planning and provision of transportation efforts for more than 25 years, where she has taken a truly integrated

approach to London's development. Prior to joining CH2M then Jacobs in 2017 Elaine served as Head of Transport Policy and Strategy for Transport for London where she led the development and delivery of TfL's strategic policy covering environmental, sustainability and transport policy, service planning related to equalities and inclusion policy and impact assessments. She was responsible for developing the transport elements of the Mayor's spatial development plan and the Mayor's Transport Strategy for next 20 years. In this regard she led major area based studies to develop priorities for investment as well as the development of appraisal and strategic evaluation tools, the outcome-based monitoring framework and prioritisation and evaluation in business planning processes to deliver the agreed strategic outcomes for the London.

4.15 In addition to holding an MSc in Urban Development at the University of Strathclyde in Scotland, and BSc (Hons) in Geography at the University of Glasgow, Elaine is a founding member of the UK's Transport Planning Society and served as its Chair and has been active internationally through her roles as Commissioner on Union Internationale des Transports Publics (UITP)'s Sustainable Development Commission and as a Commissioner of the UK's Travel Demand Commission and Board member of the Association of European Transport (AET). Elaine is also currently a Commissioner on the South East Wales Transport Commission and is also advising DfT and Network Rail in shaping of a new national whole industry strategy for rail.

Anthony Venables CBE, FBA

4.16 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.

4.17 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

4.18 An international 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 – he considers himself a 'pracademic'. As a Technical 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 TAG as a tool to improve best practice. A recent

two-year secondment to Sydney has provided him good insights into how guidance and techniques are applied on the other side of the world.

4.19 Throughout his career, Tom has emphasised and contributed to knowledge sharing in modelling and demand forecasting and he increasingly uses social media for that purpose. 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. Until recently he held a position as Visiting Professor at the University of Leeds.

Bryan Whittaker

4.20 Bryan Whittaker is a Director of WSP and is a transport modeller specialising in transport modelling associated with both public and private sector projects. His experience includes data analysis, transport modelling for all modes of transport, demand forecasting, business case development and provision of strategic transport advice. He has given transport evidence at several Highway and Planning Public Inquiries, the most recent being the M4 Corridor around Newport proposed highway scheme. Whilst in the private sector, Bryan has also led a number of research projects commissioned by the Department for Transport.

4.21 Prior to joining the private sector, Bryan spent a significant number of years employed by the Department of Transport and the Highways Agency (now Highways England). During this period he was responsible for the delivery of a wide and varied range of innovative practical and theoretical projects. During this period, he served as a member of a number of Governmental Project and Steering Groups. He has been a regular presenter of papers at the European Transport Conference and is currently a Council Member of the Association of European Transport.

Tom Worsley CBE

4.22 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.

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. Joint Analysis Development Panel Terms of Reference

Aim

5.1 The aim of the Joint Analysis Development Panel (JADP) is to ensure that DfT's appraisal, modelling and evaluation methods continue to represent international best practice by providing constructive challenge and encouraging fresh, innovative thinking.

5.2 The panel brings together academic and professional experts with senior Departmental analysts. It was established in 2015 and is jointly chaired by DfT's Chief Analyst, Amanda Rowlatt, and Peter Jones, Professor of Transport and Sustainable Development, University College London.

Remit

5.3 JADP meets four to five times a year and provides strategic advice and challenge on the Department for Transport's approach to developing its transport modelling, appraisal and evaluation guidance and methods. Over the coming year the panel will be invited to add fresh perspective and challenge on the delivery of DfT's Appraisal and Modelling Strategy. Topics are likely to include National Transport Model development, understanding and presenting uncertainty and valuing qualitative aspects of travel.

5.4 The panel is not intended to replace the more focused peer review we subject our analysis and research to on a regular basis. In addition, we will continue to engage widely across topic areas where we look forward to maintaining close and productive working relationships with all our stakeholders.

5.5 Panel members generously provide their time free of charge to prepare for and attend meetings but travel costs are reimbursed. Meetings are usually held in London and are scheduled to start mid-morning to allow for travel time. In addition, members attend a full day workshop once a year which is held outside London.

5.6 Panel members are sometimes invited to undertake additional, paid, work to provide greater depth and analysis of certain topics that have been discussed. Any additional work undertaken by individual members in response to requests from DfT would be procured under the Department's standard procurement processes. Members would be reimbursed at their daily rate, upon completion of satisfactory deliverables. The availability and/or 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 ten 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 and inject the latest academic thinking and practitioner insights.

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 be expected to notify the JADP secretariat of any changes in circumstances that affect the answers given in the integrity and conflict of interest form supplied on application. This information will be held by DfT and not shared with third parties.

5.10 The group includes a number of DfT senior analysts, including 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 is supported by a wider network of subject matter experts who are invited to attend meetings as appropriate.

Annex A - Seven Principles of Public Life 'Nolan Principles'

1. Selflessness

Holders of public office should act solely in terms of the public interest.

2. Integrity

Holders of public office must avoid placing themselves under any obligation to people or organisations that might try inappropriately to influence them in their work. They should not act or take decisions in order to gain financial or other material benefits for themselves, their family, or their friends. They must declare and resolve any interests and relationships.

3. Objectivity

Holders of public office must act and take decisions impartially, fairly and on merit, using the best evidence and without discrimination or bias.

4. Accountability

Holders of public office are accountable to the public for their decisions and actions and must submit themselves to the scrutiny necessary to ensure this.

5. Openness

Holders of public office should act and take decisions in an open and transparent manner. Information should not be withheld from the public unless there are clear and lawful reasons for so doing.

6. Honesty

Holders of public office should be truthful.

7. Leadership

Holders of public office should exhibit these principles in their own behaviour. They should actively promote and robustly support the principles and be willing to challenge poor behaviour wherever it occurs.