



Department  
for Transport

# **Joint Analysis Development Panel**

## **Annual Report 2022-23**

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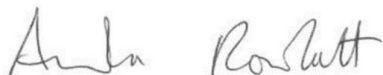
# Forewords

This is the seventh and final annual report of this iteration of the Joint Analysis Development Panel (JADP); a new panel has been set up to run from 2024 onwards. The panel has continued to provide very useful input to DfT's thinking, meeting six times during the year including two all-day workshops.

We have heard views from JADP and other academics on a range of key topics including net zero, transport & wellbeing, and modelling and forecasting challenges.

As we come to the end of our Appraisal and Modelling Strategy (AMS) published in 2019, JADP members have offered invaluable advice to DfT on helping shape the next Appraisal and Modelling Strategy (AMS II) and on future transport needs in a post Covid world. They have also provided advice on ongoing challenges including transformational change, understanding travel behaviour post Covid and the future of modelling.

On behalf of DfT I would like to thank the JADP members for their excellent service since being appointed in 2015, providing the useful and constructive challenge we need to deliver our modelling and appraisal ambitions. I am particularly grateful to my co-chair Peter Jones for his thoughtful and thorough input and leadership.



Amanda Rowlatt, Chief Analyst

The Panel has had a very busy schedule since our 2020-2022 report, covering over twenty topics that have ranged widely in coverage, from strategic issues around modelling and appraisal, to Triple Access Planning and Place-Based analysis. Our meetings have been very productive, providing an appropriate mix of challenge and support; and I have been encouraged by the contributions that the Panel has been able to make in supporting advances in the analytical toolkits provided by TASM. A summary of these recent achievements is provided in this report.

JADP will now begin a new phase of its work, with a new chair and co-chair and some turnover in membership. I would like to thank all members for their valued inputs and constructive contributions, and for the thoughtful presentations provided by many staff from across DfT. Finally, I would particularly like to thank Amanda Rowlatt for her support to me and the Panel, and for her leadership within DfT.

I'm sure that the new JADP will be able to respond nimbly and insightfully to the many challenges that lie ahead, and wish the Panel every success.

A handwritten signature in black ink, appearing to read 'Peter Jones'. The signature is stylized with a large, sweeping initial 'P' and a long, curved underline.

Peter Jones

Professor of Transport and Sustainable Development, UCL

# 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, Centre for Transport Studies, University College London.
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 DfT's Appraisal and Modelling Strategy<sup>1</sup>. Topics have included net zero, travel behaviour post Covid, transformational change and technology and AI.
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 look to refresh our Appraisal and Modelling Strategy, last published in 2019.
5. This annual report summarises the panel's discussions covering 2022-23 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.

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

# 1. Introduction

## Background

- 1.1 This is the seventh annual report of the Department for Transport's Joint Analysis Development Panel. It covers the panel's activities from May 2022 to December 2023. 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.

## Membership

- 1.3 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.

## Format of meetings

- 1.4 The panel has met six times over the past nineteen months. Meetings are normally structured around two or three substantive topics with departmental analysts and, on occasion, presentations from JADP members as well as subject matter experts.
- 1.5 Topics have been selected on the basis of DfT's priorities and suggestions from panel members.
- 1.6 The full list of topics for 2022/23 were:
  - Connectivity metric
  - Place-Based Analysis
  - National Road Traffic Projections (NRTP): Emerging Results
  - Why we have a core scenario
  - Do we need an activity-based model?



- Appraisal, policy and strategic planning
- COVID impacts in modelling and appraisal
- Net Zero Imperative and decision making
- Transformational projects and appraisal
- Scenarios and uncertainty: embedding the Common Analytical Scenarios
- Overview of research on transport and wellbeing
- Role of transport for wellbeing of older people
- The potential for personalised public transport solutions to enhance job seekers' access to employment sites
- Modelling and forecasting challenges
- Strategic Transport Evaluation Policy Support tool (STEPs)
- Strategic TAG Unit, linking the strategic and economic cases in TAG
- Synthetic population generator
- Climate Change Adaptation Analysis using National Transport Model (NTM)v5
- Long term impacts of Covid on travel behaviour
- Appraisal and Modelling Strategy II
- Public transport investments, displacements and Levelling Up
- Triple Access Planning and appraisal
- How AI could be used for modelling

1.7 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 at each meeting since May 2022.

### Summary of discussion on 1<sup>st</sup> June 2022 meeting

- 2.2 Topics for discussion at this meeting were: Connectivity Metric, Place-Based Analysis, National Road Traffic Projections (NRTP): Emerging Results, Why we have a core scenario, Do we need an activity-based model?

### Connectivity Metric

- 2.3 DfT presented a paper on their draft/an early version? Model of Connectivity (MoC). The MoC is a metric given as a score for each Lower Layer Super Output Areas (LSOA), essentially it measures someone's ability to get to where they want to go. It works by choosing an appropriate starting point in an LSOA and finds how long it takes to get to specific places, it aims to cover as many modes of travel and destination types as possible. Importantly, rather than measuring just the density of transport options, the connectivity metric measures the impact of transport. By understanding the impact of transport, we can support the DfT's strategic priority to grow and level up the economy.
- 2.4 The panel pointed out the importance of capturing rarely made trips, for example, going to the hospital, which could be difficult. There would be a need to ensure this doesn't get lost in the quantity of other trips.
- 2.5 On the question of aggregating trip purposes into one, you could have either an overall score for an index or you can have it broken down into categories which would allow greater detail for people who want to see connectivity for a more specific trip/mode, for example in the Index of Multiple Deprivation (IMD). A panel member suggested getting in touch with TfL who had developed a similar model<sup>2</sup>, as well as 2014 work by Derek Halden.<sup>3</sup>

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<sup>2</sup> <https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts>

<sup>3</sup> <https://www.gov.uk/government/statistical-data-sets/acs05-travel-time-destination-and-origin-indicators-to-key-sites-and-services-by-lower-super-output-area-lsoa>

- 2.6 A panel member pointed out that there are two parts to this model, firstly calculating travel times and secondly demand for where people want to go, it may be useful to present the results of both. Expanding on this, the panel member said it is not always the case everyone wants to go where there are lots of jobs or the central hubs. There was interest in how buses have been incorporated into the model due to irregular bus timetables, for example, sometimes the lack of availability mid-week or later in the evenings. Therefore, it is not just a question of can you get there, but also can you get back.
- 2.7 DfT responded in agreement, there is ongoing work with internal journey times statistics teams on this to ensure our work aligns with theirs. On the point of irregular timetables over different times of day, the aim is to go as granular as needed to capture these irregularities within the model.
- 2.8 A panel member pointed out that some commercial providers already have similar tools (examples include: TravelTime, Basemap TRACC, Accession<sup>4</sup>). These tools have similar objectives, but users are Local Authorities. The panel questioned who the connectivity metric tool would be aimed at?
- 2.9 The panel provided some references: The Community Life Survey presentation may be informative<sup>5</sup>, David Levinson work may be insightful and relevant<sup>6</sup>, also see last year's Landor Data and Modelling Yearbook which has a section on accessibility planning with links to providers,<sup>7</sup> and see WebCAT.<sup>8</sup>
- 2.10 Echoing an earlier point, panel members agreed that the value of this tool is not only looking at the aggregate but also in the detail. This could include looking at how accessibility compares across different modes or across different trips.
- 2.11 DfT explained they intend to provide as much detail as they can and not just the aggregate scores, they will look at each combination of time of day, mode and trip purpose and will provide all the separate scores. DfT gave an example use case, the tool could be used if you're working on housing policy and want to choose a suitable area for development that has good public transport connections.
- 2.12 A panel member raised the point that this model uses an isochrone approach using travel time as the metric, one of the critiques of the isochrone method is how defensible it is to generalise across model, for example, can buses and trains be homogenised into a single public transport mode? The questions asked and areas of interest go beyond an isochrone approach, the approach so far has been place-based and going into a random utility would lend itself more to a person and place-based approach which would answer the policy questions being posed.

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<sup>4</sup> <https://www.transportxtra.com/publications/local-transport-today/supplements/380/23072/accession/>

<sup>5</sup> <https://www.gov.uk/government/statistical-data-sets/community-life-survey-journey-time-statistics-202021>

<sup>6</sup> [https://ses.library.usyd.edu.au/discover?query=levinson&filtertype=type&filter\\_relational\\_operator=equals&filter=Book](https://ses.library.usyd.edu.au/discover?query=levinson&filtertype=type&filter_relational_operator=equals&filter=Book)

<sup>7</sup> [https://issuu.com/landorlinks/docs/d\\_myyearbook\\_complete](https://issuu.com/landorlinks/docs/d_myyearbook_complete), p.31 onwards

<sup>8</sup> <https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-with-webcat/webcat>

2.13 DfT explained they're looking for insight into some of the complexities that have been discussed and will be working with Leeds ITS and developing the socio-economic angle of the model as it is understood it matters what the available transport options are in the area in relation to the demographics in that area. Furthermore, DfT want to be able to unpick the aggregated scores and be able to see differences easily, for this reason it will be very clear where there is aggregation.

## Place-Based Analysis

2.14 DfT presented a paper on their upcoming Placed Based Analysis unit. Her Majesty's Treasury (HMT) updated the Green Book (GB) in November 2020 to reflect the findings and recommendations of the Green Book Review. As part of this, the revised Green Book includes a new annex on 'Place Based Analysis'<sup>9</sup>. The annex aims to provide greater consistency in how scheme promoters assess the potential impact of options on different geographical areas and how these impacts are presented to decision-makers.

2.15 DfT posed the following questions to the panel:

- Is the draft guidance sufficient to provide scheme promoters with the means to undertake place-based analysis?
- What challenges/barriers do we face in embedding the new guidance into appraisal practice?
- Has the updated guidance satisfactorily addressed comments previously made by JADP members?

2.16 The panel discussed some of the challenges involved with place-based analysis, chiefly the dependence on land use change, and assessments using supplementary economic modelling are very uncertain. The guidance helpfully steers clear of SEM uncertainties and instead focuses on it from transport users benefit appraisal (TUBA) outputs or agglomeration effects. Another point raised was that there is quite a lot of interaction between distribution analysis and place based analysis, the static nature of (spatial) distributional analysis is challenging as does not reflect land-use change.

2.17 A panel member noted the social impacts area is weaker and perhaps lagging behind the other measures.

2.18 DfT explained they ran an exercise on which TAG impacts have potential to be disaggregated spatially and the methodological reasons which resulted in a shorter list but are happy to look into this further to provide more substantial outputs. Overall, there was reassurance that the challenge from the panel hadn't been to expand the guidance meaning the scope of the project is about right.

2.19 A panel member added that some narrative on how the distribution of benefits are likely to occur between different places within the study area and outside the study area would be helpful. In addition, spelling out the different ways in which the two-

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<sup>9</sup> ([see Annex A2: Place Based Analysis pages 91-96 including boxes 24 and 25](#)).

way road effect manifests would be useful, it would enable users to think through logically and sequentially.

2.20 The panel concluded it is difficult to model place-based impacts and predict land-use change as the benefits don't always end up near the intervention.

## National Road Traffic Projections (NRTP): Emerging Results

2.21 DfT presented a paper on their National Road Traffic Projections (NRTP) 2022. They set out updated assumptions based on more recent data that underpin the Common Analytical Scenarios (CAS). Questions posed to the panel included:

- Does JADP agree with DfT plans to explore sensitivities around vehicle operating costs and vehicle occupancy as part of the next phase of work?
- In the coming months TASM are set to review the evidence on the impact of COVID and the associated approach to adjusting for it.
- Horizon scanning, what should we do next, and any thoughts on how to untangle the various influencers such as high fuel prices, GDP changes, Covid as we plan to develop guidance on how to adjust for COVID and adapt existing models.

2.22 Commenting on the relationship between traffic growth and road building, a panel member suggested to first isolate population growth and see what the results are. This would allow you to identify on a per person level rather than the total.

2.23 On the question of horizon scanning, a panel member noted there are multiple levels to what's been going on, if we want to assess road 'scarring' you can't do that by just looking at traffic growth, you must also look at the bus industry and rail industry to get a sense of the total impacts of covid on travel. The National Travel Survey (NTS) will be a good source to measure this once updated figures are released.

2.24 The panel agreed untangling the longer-term implications of Covid on travel will be difficult which had been noted for work being done on Clean Air Zones (CAZ) analysis. The All Change travel tracker has been very useful, the wave 6 report which is not yet published would also be useful data for industry. The panel also added that an area of future research should be trip frequency

2.25 DfT confirmed the All Change wave 6 data<sup>10</sup> will be released.

2.26 A panel member supported the idea of looking at trip frequency, it is understood this is highly dependent on type of job and income group therefore the NTS will be a key data source. What that means is applying average reductions to account for people working from home does not make sense, it will vary by industry and region, therefore, this needs to be better reflected going forward. Sensitivity testing around vehicle operating costs is a good idea, this is an area of significant uncertainty. Cost sensitivities are key given ownership models and EV take-up. One of the issues that Covid has highlighted is the issue around scenarios underplaying uncertainty by not varying levers together and being a bit too one dimensional. So perhaps scenarios

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<sup>10</sup> <https://www.gov.uk/government/publications/covid-19-travel-behaviour-during-the-lockdown>

underpredict outcomes as in the real world there are lots of factors at play, occurring simultaneously.

- 2.27 DfT confirmed they will be looking at trip frequency via the NTS work. There are no current plans to do another All Change travel tracker post wave 6 and that the NTS will continue to be a reliable data source. DfT agreed investigating vehicle operating costs would be sensible going forward.
- 2.28 A panel member suggested also looking at trip lengths as well as frequency to build a full picture.
- 2.29 It was mentioned that it would be useful to discuss the role of forecasting in the context of zero carbon in a future meeting. The panel member went on to say that at the moment we're doing scenarios based on assumptions in changing variables that affect traffic growth. But another way to do scenarios is to look at it retrospectively, set an end goal of where we'd like to get to and then create a set of scenarios that would get us to that end point.
- 2.30 DfT acknowledged the retrospective scenario option and recognised it could be a useful exercise but would be a completely different exercise to what is currently being done and is therefore resource contingent. On modal shift to rail, DfT informed the panel that they do have updated rail costs in the model, though, to be clear, it is not really a rail capacity model. There was agreement for looking at total distance travelled alongside trip frequency.

## Why We Have a Core Scenario

- 2.31 DfT presented a paper discussing the core scenario and its purpose within the wider set of Common Analytical Scenarios (CAS).
- 2.32 DfT set out the following areas of discussion to the panel:
- Should we have any 'core' scenario?
  - Should we call that scenario 'core' (previously it has been referred to as 'reference')
  - It's function, in modelling terms, is as a pivot or fulcrum, which minimises change in input assumptions, to which additional assumptions may be applied.
  - It's function in appraisal terms is to ensure some commensurability between business cases for the largest and smallest schemes that is fair - not overburdening the smallest schemes with analysis while preventing the largest schemes from evading scrutiny.
- 2.33 A panel member kicked off the discussion by suggesting we could use any CAS as the common comparator, it doesn't have to necessarily be the core. There was concern that the core has no climate change while still having traffic growth. Thus, you may end up fulfilling the core scenario and not meeting net zero. The panel member went on to say that the regime for selecting scenarios becomes critical under the 'common comparator' approach, therefore there is a need for more prescriptive advice.

- 2.34 It was discussed that the core not necessarily being the most probable or certain scenario is profound, but the panel did understand the logic and purpose of having a core scenario in its function to ensure there is some commonality between appraisals. However, if the core is the only prescribed scenario and everything else is voluntary and in the hand of scheme promoters, then it is no longer neutral. Therefore, the panel suggested there is the need for other scenarios to be prescribed otherwise it leaves it to the judgement and discretion of the promoter.
- 2.35 Another panel member added we need to look at the whole appraisal cycle. It is important to have a common scenario with all appraisal impacts.
- 2.36 DfT acknowledged the points raised by the panel and agreed DfT needs to clearly communicate the CAS with their stakeholders. They explained this is very much the purpose of the Uncertainty Toolkit which explains proportionality and level of impact requirements. In particular:
- All schemes must consider all scenarios qualitatively;
  - The largest schemes must do all modelling in all scenarios;
  - The smaller schemes may omit modelling for some non-core scenarios if they provide a narrative account of why those scenarios are not particularly challenging for those schemes, for example the challenges are sufficiently covered by the schemes that aren't modelled;
  - There is also a provision for omitting new modelling of scenarios at the Full Business Case (FBC) if the modelling Strategic Outline Business Case (SOBC) indicates overlap between the challenge provided by scenarios;
  - No scheme is obliged to omit consideration of any scenario, and scheme promoters are permitted to formulate additional scenarios reflecting local uncertainty, should they choose to do so.
- 2.37 The core scenario is used to pivot off for the other scenarios so it would be complicated to move away from this approach. It would pose a challenge both for the DfT and stakeholders of the CAS. DfT agreed with the need to take this away and think through the consequences with a view to coming back to JADP.
- 2.38 DfT informed the panel that they have and will continue to have discussions internally, and that it is a challenging time to be defining a core scenario. There is also the possibility that over time as we move out of the current landscape a lot of these issues may resolve themselves.
- 2.39 Some final wrap up points from the panel were that there is less concern about which CAS to use, than the regime for ensuring the alternative scenarios are unbiased between modes and policies.

## Do We Need an Activity-Based Model

2.40 DfT presented a paper on whether there is a need to develop a national Activity Based Model<sup>11</sup> (AcBM), an alternative to the traditional 4-step model. DfT explained they already have a National Transport Model (NTM) to project traffic growth, explore uncertainty, undertake strategic policy analysis and provide growth rates for scheme appraisal. There could be improvements in the following areas from developing a national AcBM:

- Produce growth projections for all modes, including public transport and active modes;
- Ability to test a wider range of policy to support DfT's strategic priorities.
- Better explore behaviour changes in an increasingly uncertain world.

2.41 A panel member suggested thinking about what the benefits of an AcBM would be for policymaking and what policies will ABMs help in terms of analysis. This would help DfT understand what aspect of AcBMs are most important. Also to think about the associated costs, for example run times or multiple runs with different seeds.

2.42 The panel suggested it may not yet be the time to develop a national AcBM, it will be a too big step and that the DfT needs to do exploratory work to start with. It was also mentioned that you cannot build activity-based model from National Travel Surveys, instead you need a time use survey. A lot of the current AcBMs floating around are really just trip/tour and trip-chaining models, what's missing from these models is the need to reflect trade-off between in-house and away from home activities. Time use survey data shows that people tend to carry out several activities at one destination, while trip diary only shows one trip purpose.

2.43 A panel member added, in the long run, it may be seen as not just a DfT model, because as you learn more about multiple activities at the same time, there can be spill-over benefits for understanding impacts of policies on other sectors such as energy and water use. With the right input data, potentially the model could become a cross-government tool. The panel member ended by supporting building an AcBM is a great idea in the long run, but it's important to take small steps along the way.

2.44 A panel member suggested building an AcBM in-house within DfT to have a better understanding of the model to start with, before commissioning any big project, the real benefits will be what DfT can learn from the capability of AcBM. And that there is certainly a lot of interest around this type of model at the moment.

2.45 DfT clarified their view is that these models are more useful for policy-testing and providing more nuances beyond 'classic' approaches, rather than scheme appraisals. This would be DfT's angle - how to get more nuance to supplement but not replace NTM. DfT gave the example of building income segments into their NTM which would take a year or two, but would having something like an AcBM help reduce the time?

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<sup>11</sup> Activity-based model: "Modelling activities that drive transport demand."

"Forecast travel demand with defined purposes and activities, the type of travel required to fulfil these activities, destination, time of travel, and mode of travel used to access activity."



- 2.46 A panel member added, there are several proof of concepts for AcBMs already around, albeit quite simple, so it would be useful for DfT to engage with those already in this space to learn more about why they decided to do it and how they're developing the models. But, as an aside, the computational requirements are substantial.
- 2.47 The panel said it might be helpful for DfT to start thinking about what kind of guidance would be needed on how to assess business case using AcBMs. What kind of level of validation required for this kind models for business cases? How do we test the responsiveness and the reasonableness of the model?
- 2.48 DfT concluded by acknowledging the consistent message across JADP, developing a national AcBM will be a big step and that DfT should start by drawing on from existing work, commission a scoping study, communicate with organisations who have developed these models and compare with DfT's NTM.

## Summary of discussion on 28th November 2022 meeting

- 2.49 Topics for discussion at this meeting were Appraisal, policy and strategic planning and COVID impacts in modelling and appraisal.

## Appraisal, Policy and Strategic Planning

- 2.50 DfT set out a paper regarding the role of TAG and cost benefit analysis in supporting decision-making, particularly in the context of vision-led strategies. The paper sought to explore any potential actions TASM could undertake in order to better facilitate understanding of the role of analysis as part of the decision-making process and making the appropriate links to the policy context, whilst maintaining the neutral integrity of cost benefit analysis.
- 2.51 DfT asked the question whether TAG should have more explicit linkages to current policy ambitions and priorities, to serve as a direct context for appraisal, to what extent TAG developments following the Green Book review have highlighted the need for better strategic links and what action DfT could take to promote the use of appraisal to support vision-led approaches to transport planning and policy.
- 2.52 The second part of the paper sets out how DfT is responding to the GB Review, aiming to make a step change in the links between the economic case and strategic case.
- 2.53 The Green Book Review of 2020 served to accentuate the virtues of good policy and planning and the derivation of SMART strategic objectives, which appraisal should seek to evidence as thoroughly as it can. The review also made clear the remit of appraisal, as limited to determining the relative social value conferred by different options to achieve a given set of SMART objectives. Proposals that do not meet these objectives are 'out of scope' for detailed appraisal and thus cannot be judged as 'Value for Money'.

- 2.54 A panel member questioned the labels used for scenarios, core/reference/most likely/central/base, the panel member argued it doesn't seem to make a difference which label is used as in practice it's always treated as the most probable, with other scenarios pivoting of it. The panel member believed this is significant because it does not have a 'defensible real-world correlate' as it has no climate change.
- 2.55 It was mentioned that there may be slight lack of guidance on how to write an economic case within the wider context of the common analytical scenarios (CAS). And that writing about how preferred option and other options behave against different backdrops would be useful. It was raised that appraisal summary tables (ASTs) may not help us, and instead we need a holistic alternative. Thought and guidance is needed here otherwise you may end up with 6 different AST's for each scenario or it could end up just being ignored.
- 2.56 The panel raised a question around how we frame the intervention, as traditionally we appraise at the scheme level, but if we elevate that to the programme level, we get closer to the policy aspiration. It was also noted that modelling is policy-agnostic but with caveats around defining the do minimum (DM) and the choice of scenarios we model. On the other hand, looking at the valuation and appraisal side, it does seem more political, such as small time savings and distributional impacts with implications for objectives such as levelling up.
- 2.57 DfT explained that the aim of cost benefit analysis (CBA) is to maximise utility and therefore wellbeing and it should be objective. Distributional benefits are highly relevant for reducing inequality, however, placing different weights on different inequality-related objectives could be a significant move away from maximising overall utility.
- 2.58 The panel noted that, while vision-led appraisal allows for strategic, coherent plans, it also provides the opportunity to go above and beyond what may seem immediately realistic and may lead to unevidenced decisions. Incremental changes can contribute to a vision, sometimes looking at things in the aggregate sense it is not possible to understand the more fundamental impacts of some of the changes related to visions. It was also noted that a programme appraisal makes sense in theory but often we do end up looking at individual projects as it's so difficult to always take account of everything in a programme.
- 2.59 Coming back to an earlier remark, a panel member raised the point that if authorities want to focus on a specific set of goals, then yes the appraisal should find a way of representing those specific goals, but also should look at things outside of scope to ensure they're not causing significant disbenefits, particularly at a national level where there may be a set of factors that aren't particularly important at a local level. Furthermore, relating back to objectives changing over time, it seems this isn't something we can control as things will undoubtedly change over times when there is a change in Government, for example.
- 2.60 The panel also remarked that resilience is typically hard to measure and identify, unlike efficiency, and that resilience often implies redundancy. Another question was whether we appraise against what's most likely to happen or what we'd like to happen, modellers can forecast what can happen, which may not align with visions. Finally, if we have to meet certain targets, should we use cost effective analysis

(CEA) or CBA? As it seems CBA is about trying out different schemes and seeing the relative benefits you get to the cost you put in, but if the outcome is fixed aren't we really talking about cost effectiveness?

- 2.61 A panel member argued that all new capacity must improve resilience by definition, so is it right that all schemes can just claim to boost resilience? One of the biggest issues in appraisal is TAG isn't applied appropriately, not that it's inadequate, either in the principles or inconsistencies.
- 2.62 DfT acknowledged the points raised, noting continuing challenges with aligning strategic and economic cases.

## COVID Impacts on Modelling and Appraisal

- 2.63 DfT presented a paper on first steps at developing a coherent, cross-modal plan to develop our approaches to modelling and appraisal in light of COVID-19. Key questions posed by DfT were:
1. Have we covered the right bases in terms of the evidence needs of modelling and appraisal post-COVID, looking to the medium and longer-term?
  2. What are the highest priority items and how should we sequence the programme (see activity below)?
  3. What are the key risks to our research programme and how can we mitigate them?
  4. Is this ambitious enough, or are more fundamental / radical shifts in our approach appropriate here e.g. greater use of Activity Based Models?
  5. How can we best leverage insights and ongoing research in academia and industry to support our planned programme of work?
- 2.64 A panel member noted the take-up in leisure and retail may be due to a rebound effect resulting from people not having been able to visit friends and family over the past few years so it may not persist, whereas commuting and business is lower and looks more stable. On the business travel side perhaps it's a result of businesses getting carbon use down and maximising what they can do online instead.
- 2.65 Another panel member said the real need is more data as things still haven't settled down yet. Also, it's not just COVID but also the cost of living (COL), rail strikes, performance of rail and changes in bus services. The question was also asked as to whether we need to separate COVID effects from other pressures.
- 2.66 The panel shared the concern of using the phrase "post COVID", in reality we are at "post-COVID's" arrival. The distinction between tactical versus strategic decision making is important to consider, it could be said humans are still playing out their tactical responses to the pandemic. A panel member developed a conceptual graph of how uncertainty changes: (i) new steady state; (ii) transitioning to new normal; (iii) uncertainty growing over time. The risk here is of seeing COVID as a single episode rather than taking a more long term holistic view.
- 2.67 One thing that was observed to be missing was day of week effects. Particularly for rail, crowding has been a major part of the case for new capacity. Reliability may be more important if you are only going to the office twice a week.

- 2.68 A panel member supported the principle of reporting on what is happening instead of saying we will wait to see what the long term is then go from there. But the consideration there is to how the report is framed, it would be misleading for example to say this is what is currently happening now and therefore that's our best guess for the long term.
- 2.69 The panel agreed the difficulty facing DfT with the simultaneous need for embracing uncertainty but at the same time give as much clarity and assurance to the sector that there is a reference case we want to gravitate toward, with a possible risk of mixed messaging.
- 2.70 DfT agreed with the points raised, recognising the challenges raised in relation to providing advice on how to account for COVID in modelling and forecasting. There is a need to reflect the evidence on long-term impacts and perhaps some scope to assume further recovery on rail as well as other modes. DfT agreed COVID is part of a bigger picture and there's a need to look at everything together as suggested by panel members.
- 2.71 Caution was noted that if any guidance DfT released is perceived to be too direct and prescriptive it could lead to overzealous changes with models being adjusted and the real concern here would be the spread of impacts across different regions. It was suggested that DfT should instead advise stakeholders what they should be thinking about going forward.
- 2.72 The panel agreed with the general approach laid out in the paper and recognised the complexities. The questions that are being asked are: has there been a structural break – yes, do we understand it – no. It is too early to speculate on the trend effect, but DfT can send out acknowledgement as to the disruption in the status quo. The priority focus should be on trip rates and rebasing models.

## Summary of discussion on 19th January 2023 awayday

- 2.73 Topics for discussion at this meeting were Net Zero Imperative and decision making, Transformational projects and appraisal, Scenarios and uncertainty: embedding the CAS, Overview of research on transport and wellbeing, Role of transport for wellbeing of older people, The potential for personalised public transport solutions to enhance job seekers' access to employment sites, Modelling and forecasting challenges.

## Net Zero Imperative and Decision Making

- 2.74 The panel presented a paper discussing reaching net zero with our current Cost Benefit Analysis (CBA) framework. It was argued that the baseline trajectory<sup>12</sup> may not be in line with decarbonisation needs. The panel made the point that Carbon savings are not the same as reductions. Also, DfT shouldn't ignore the embedded

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<sup>12</sup> <https://www.gov.uk/government/publications/transport-decarbonisation-plan/additional-information-on-assumptions-used-to-develop-decarbonising-transport-scenarios>

greenhouse gases (GHG) that arise from the turnover of the national fleet and scrapping viable internal combustion engine (ICE) vehicles. It is important to look at global trends and reflect the impacts of climate change in forecasts.

- 2.75 In summary, CBA is capable of handling ‘imperatives’ and there are well established procedures for doing so. Essentially this means maximising net present value subject to a constraint, like a budget constraint, and this can produce well defined rules which cover options, policies, ranking and rejecting projects. But, only on certain conditions about consistency, modelling, treatment of alternatives, scrutiny, regulation, transparency and compliance.
- 2.76 A panel member noted the focus for decarbonisation should be on CO<sub>2</sub> and not vehicle kilometres.
- 2.77 Next, DfT presented their paper setting out carbon-related appraisal work including carbon valuation and reflecting whole life (total) carbon costs. Some of the current workstreams include aligning TAG guidance with updated [supplementary Green Book guidance](#) published by BEIS in 2021 which now has a single price for traded and non-traded carbon emissions.
- 2.78 DfT informed the panel on working being done on quantifiable carbon reduction guidance and presented some work exploring different carbon metrics aimed at increasing the prominence of carbon in appraisal.

## Transformational projects and appraisal

- 2.79 DfT presented a paper on transformational projects and appraisal which explored potential gaps in the appraisal framework, realising the upside potential of major projects and the use of supplementary economic modelling (SEM). Transformational projects are where there is a fundamental structural change in the nature of the subject undergoing transformation. The scale of the change alone is not a defining characteristic. The Green Book definition involves them being in practical terms virtually irreversible – in other words the removal of the intervention will not cause the system to revert to its original state.
- 2.80 A panel member suggested first defining the kinds of transformational outcomes we’d want, then seeing which projects delivered on them.
- 2.81 A panel member contended that just because a project is transformational, it doesn’t necessarily mean it is ‘good’. Costs as well as benefits (or impacts) need to be included. Transformations could lead to unintended consequences, for example job creation leading to more traffic.
- 2.82 A panel member supported the importance of qualitative work and suggested to put resources into case study data collection which would support future modelling. The importance of understanding contextual factors was also affirmed.
- 2.83 DfT agreed that identifying unintended consequences is important and identifying the contextual indicators that might signal such consequences; but added that availability of data is always a challenge.

## Scenarios and Uncertainty: Embedding the Common Analytical Scenarios

2.84 DfT presented a paper on embedding the Common Analytical Scenarios (CAS). The paper discussed related research needs, accounting for climate change and monitoring which of the scenarios we might be moving towards. DfT put the following questions to the panel for discussion:

- How should we identify trigger points that indicate a CAS is becoming more likely?
- How should we conduct horizon-scanning? Can we use AI-technology or machine learning? How often should we do this?
- How do we decide if a trigger point has been met?
- How should we respond to this information and what actions should be taken?

2.85 DfT also presented the following questions to the panel on when and how to next update the CAS:

- Are there Scenarios that can stay the same / similar? Which Scenarios are the most likely to need updating?
- What research should we be looking at and undertaking?
- When do we need to undertake new empirical work?
- What data do we need? How many years do we need?
- What are the most important structural changes post-Covid we need to survey and analyse?
- How can we account for 1.5°C/2°C/4°C warming in our forecasts?

2.86 The panel suggested there would be challenges in determining if a scenario is 'more likely' by considering trigger points. There was also a challenge around 'more likely' as this isn't in our current narrative, specifically.

2.87 It was acknowledged that the scenarios are a good way to help other strategies be robust for the future. For example, a decarbonisation strategy could check it was robust across multiple scenarios.

2.88 It was also mentioned if we want to monitor how schemes are performing against different scenarios, we need to be careful and consider multiple pieces of data. We also need to remember that sometimes the second or third best solution is actually the best one in a wider context.

2.89 Considering how the future is changing as we progress could be done in multiple ways. One option is Horizon scanning, but the panel posited that this is currently very uncertain itself and requires a lot of human input. There was also discussion of AI being used as a 'Super forecaster', but this does depend on the reliability of the data being fed in. Lastly, stochastic risk analysis was mentioned as an alternative to scenarios.

2.90 There were suggestions for areas that may need to be refined in the future, for example, technology uptake will differ as early adopters will have already taken it up.

- 2.91 Discussing the optimal frequency of updates, the panel noted there is a conflict between the scenarios needing to be consistent in order to increase uptake and adapting to current data.
- 2.92 There was an eagerness to be involved further, and a suggestion there could be internal reviews, rather than full-blown updates. Also, an acknowledgement that sometimes events stop updates from being possible (e.g. pandemic) or necessitate an update irregularly.
- 2.93 There was discussion on the impacts of Climate Change and how this is not currently accounted for in the inputs.
- 2.94 The panel suggested evaluating the scenarios and to look at the uptake of them. A good scenario should challenge our plans and increases our mitigating action.

## Presentations from University of the West of England (UWE)

- 2.95 **Overview of research on transport and wellbeing:** UWE presented a paper setting out the relevance of wellbeing, how transport can influence it, current knowledge and future opportunities in this space. UWE discussed the differences between individual vs collective wellbeing as well as objective vs subject wellbeing (SWB).
- 2.96 It was mentioned that transport has traditionally focused on objective impacts such as travel times and crashes, but the subject experience of transport is of growing interest. SWB measures mental states rather than preference satisfaction but there are measurement biases and analytical challenges with both.
- 2.97 **Role of transport for wellbeing of older people:** UWE's paper discussed the impact of mobility in later life, public transport and health and thoughts about TAG as it relates to older people. It was noted that research on public transport and health is fairly limited. The panel discussed the wellbeing benefits associated with bus pass ownership and the independence it affords older people, and perhaps we should be monetising this.
- 2.98 **The potential for personalised public transport solutions to enhance job seekers' access to employment sites:** UWE's paper discussed the role transport and accessibility plays in employment opportunities. The main findings included accessibility/transport was the second most important barrier to work, public transport was the dominant commute mode and the relevance and potential of cycling was not well recognised by respondents. Transport reliability affected people differently based on the type of job and working arrangements they have.
- 2.99 It was discussed that greater car access has its benefits, such as people willing to travel 39 – 48% further but there are significant expenses to run and maintain and congestion must be factored in. It was noted employers do recognise and care about their employees' transport options to get to their place of work.

## Modelling and Forecasting Challenges

- 2.100 DfT presented a paper discussing their modelling guidance updates. DfT informed the panel that they are undertaking a review of the TAG modelling units with an aim to review modelling guidance and address shortcomings in existing guidance, identify areas for updates and improvements to ensure best practice in modelling methods and finally, deliver clear and up-to-date guidance on transport modelling.
- 2.101 The modelling guidance update contract will look at updating advice on data use in model development, public transport assignment modelling and variable demand modelling. DfT will also start filling in the gaps in the area of modelling active modes and new mobility, as well as alternative modelling methods, activity-based and agent-based modelling.
- 2.102 A panel member said models need to reflect behaviour change and there may be a need to separate modelling for the strategic and economic cases. The panel member also mentioned that models are too focused on commuting with a poorer representation of non-home based trips.
- 2.103 A panel member questioned whether the balance is right, or is there an over-focus on supply, particularly car travel at the expense of better representation of demand responses, segmentation and model runs. Models need to start from people not trips, to better represent choice and policy impacts on people. Finally, it may be a useful exercise to think about different models for strategic planning vs detailed planning.
- 2.104 The panel discussed starting from the beginning and asking the question, why do we model at all? Answering this question would help us understand all the different reasons and how they relate to the work we do. It was mentioned that TAG concentrates on modelling for the economic case, while other modelling types can be more useful for the strategic case. Also, do we have the right expertise in place or is there over reliance on consultants who don't set out all the pitfalls. Therefore, DfT's role could be to alert stakeholders on benefits and pitfalls on certain types of modelling.

## Summary of discussion on 20<sup>th</sup> April 2023 meeting

- 2.105 Topics for discussion at this meeting were: Strategic Transport Evaluation Policy Support tool (STEPS), Strategic TAG Unit - Linking the strategic and economic cases in TAG.

## Strategic Transport Evaluation Policy Support tool (STEPS)

- 2.106 DfT presented a paper on a Strategic Transport Evidence Policy Support tool. DfT currently use version 2 and version 5 of the National Transport Model (NTM) to conduct analysis for a wide variety of stakeholders. Version 2 of the NTM is adept at producing accurate and robust outputs at the regional level, but it is time consuming to run, maintain & quality assure. Not all outputs that are produced by the National Transport Models are required for all stakeholders, each stakeholder has different data needs. Consequently, there may be scope for the creation of a more responsive



policy tool that will require fewer resources to run and provide better tailored outputs for our stakeholders. Questions DfT posed the panel were:

- Should the department develop simpler transport analysis tools to support policy making?
- What are the benefits the panel can see from simpler more agile models?
- What simplifications could you be happy making?
- What kind of tools would you suggest we investigate?

2.107 The panel agreed there would be benefits to developing and implementing simpler tools but potentially what the need really is, is for faster running models (which could be synonymous with simpler models). Faster running models would allow DfT to explore a wider range of options at the strategic stage, this ties in with a common criticism that not enough attention is focused on option generation at the start of the appraisal process. One of the problems with simpler models is how congestion is represented.

2.108 It was mentioned that modelling active travel as well as Connected and Autonomous Vehicles (CAVS) will be challenging under a simpler model.

2.109 A panel member questioned whether the very need for a simpler model would become obsolete if DfT had access to a supercomputer that could drastically reduce model run time. Also, would it heighten the nervousness of using the simpler model and would decision makers have the same level of confidence in using the simpler model, possibly making it a problem of depth vs breadth.

2.110 The panel suggested that a simpler, quicker model may not be the solution to the questions that are raised around what our current models can't do and fall short of and that DfT may be able to achieve quicker runs with National Transport Model (NTMv2) by recoding it with different software. This would also have the benefit of open sourcing the tool and providing greater accessibility to the data within it.

2.111 DfT agreed there is scope to modernise the environment for NTMv2 and took on board the suggestions raised by panel members. It was also noted that the question of what we want this new, simpler model to do is very much part of a wider engagement exercise where opinions from all stakeholders are welcomed, it is key we agree on a scope and how best to fill the current gaps before jumping into a new model.

2.112 A panel member suggested there would be an increase in work requirements coming out of modelling, particularly in terms of segmentation. The example of Clean Air Zones (CAZ) was given where splitting matrices into compliant and non-compliant has increased run times quite significantly and going forward we can expect more and more segmentation as we move towards Net Zero.

2.113 It was mentioned that a previous attempt at developing a relatively simple elasticity based aggregate model didn't get used. One of the reasons was to not confuse ministers with information from two models. So it raises the question of what would a simplified model do better other than the speed advantage.

- 2.114 DfT agreed thought needs to be put into the objectives of a simpler model, and noted benefits seen in simpler models at the scheme level as opposed to the national level. A key question is where we can simplify without materially changing the results of a model.
- 2.115 A panel member raised the point that currently even for complex strategic models, predicting working from home choice is a big challenge, as well as transport supply changes in response to changes in the demand for services. Therefore, a simpler model could be used to fill the gap here and pick up where more complex models fall short.

## Strategic TAG Unit, linking the strategic and economic cases in TAG

- 2.116 DfT presented a paper on taking forward considerations of the link between the strategic and economic cases for a new TAG unit. This paper is a follow-up to the paper presented at JADP on 28th November 2022 on “Appraisal, Policy and Strategic Planning”. This was a very interesting and useful discussion on the direction of TAG with regards to use in decision-making, and the philosophical and practical way that cost benefit analysis may be used in support of strategic objectives.
- 2.117 The Green Book Review highlighted the importance of strategic objectives and their link to the economic case. Most prominently, the Green Book now advises that schemes that do not meet their strategic objectives should not be shortlisted for further appraisal, since they do not achieve value for money for the proposed transport solution to the identified problem.
- 2.118 This paper effectively serves as a sub-set of the previous paper, focusing in on the issues we are considering ahead of our composition of a planned bespoke TAG unit aimed at providing better guidance on economic and strategic case links.
- 2.119 DfT highlighted several aims of the new guidance:
- to more strongly promote the value of social welfare Cost-Benefit Analysis in supporting strategic objectives;
  - to clarify the importance of appraisal in terms of presenting impacts relevant to strategic objectives, not just to provide a BCR;
  - clearly defining Strategic Analysis;
  - to strengthen the formality of reporting and introduce a Strategic Analysis Statement,
- 2.120 A panel member raised the question whether it is suitable or necessary to always go for consistency, must we always raise concerns about a scheme if the benefit cost ratio (BCR) is low but it meets all the strategic objectives? The example of a scheme

with an incongruous BCR and strategic objective was given, and it was questioned whether this is the case because our analytical framework falls short as it just can't give a sensible assessment of the BCR and strategic case, or is the framework being poorly applied. Lastly, could it be we're being told by the analysis that there simply are reasons we can have this dissonance. There could be a danger of introducing optimism bias with this new guidance in the sense that it's moving things 'upwards'. The sentiment of bridging the links between the BCR and the strategic case was appreciated, but to what end.

- 2.121 DfT empathised with the concerns raised and agreed that the fact that the strategic objectives are met but the BCR is low could reflect on the analytical framework but it also could be that the way the scheme promoters have chosen to present their case also leads to this dissonance that's been mentioned. Therefore, it is important to treat these cases carefully and proportionately and make sure we can articulate how the two parameters relate to each other. It must also be remembered that BCRs only tell us about things that can be confidently monetised and that is why our framework is based on our value for money framework to reflect the things that can't be monetised.
- 2.122 The panel as a whole recognised the usefulness of this type of initiative from DfT and said maybe it's not about bridging but about identifying the gap between the two and making it obvious that there is sometimes a difference that exists. Maybe the strategic objectives need to exhibit SMART objectives to a stronger degree, and this could alleviate some of the discrepancies without needing to reconcile absolutely everything.

## Summary of discussion on 3<sup>rd</sup> October 2023 meeting

- 2.123 Topics for discussion at this meeting were: Synthetic population generator, Climate Change Adaptation Analysis using NTMv5, Long term impacts of Covid on travel behaviour.

## Synthetic Population Generator

- 2.124 DfT presented a paper on developing a new synthetic population generator to replace their National Trip End Model (NTEM). NTEM is a trip generation model of Great Britain, forecasting the potential evolution of demand for travel over the medium/long term. NTEM has served its role well and is widely respected, well supported, provides good support for 4-stage transport modelling and is consistent with appraisal guidance. However, it does have some drawbacks. It is old fashioned software that is ageing fast, difficult to use with automation, out of sync with DLUHC tools and doesn't support activity-based modelling. The plan is for the new software to replace most NTEM components and create a synthetic population as an intermediate output. This will enable better distributional analyses and better support for activity-based models.
- 2.125 The panel welcomed the idea of using this opportunity to aim to make the software open source in the future. It was noted there are academics with experience with

synthetic population software from different disciplines and they have knowledge on the pitfalls so it would be a good idea to be in contact with people in this space.

- 2.126 The panel discussed which segments would be part of the synthetic population such as age, gender, employment status but also employment type would be important, given the post-COVID world we're in and incorporating working from home into our modelling. There would be value in having access to the different options separately (synthetic population, car ownership and trip rates). It would also be useful to be able to predict electric vehicle uptake.
- 2.127 The panel noted the Technical University of Denmark have done a lot of work on synthesising populations and would be a useful contact as well as Leeds Institute for Data Analytics.
- 2.128 In response to the segmentation of the new software, DfT agreed increased segmentation would be useful and this is something they are looking into, including with regards to differentiating vehicle type in the National Car Ownership Model (NATCOP).
- 2.129 A panel member mentioned the scope of the work does seem ambitious, so there is a need to be mindful of what data there is out there that could be used to build this tool.
- 2.130 The panel challenged the 3-year publication cycle proposed for NTEM, a longer cycle may be more suitable due to the sheer volume of work required.
- 2.131 DfT informed the panel the 3-year cycle was what came out of the NTEM discovery work that took place just before the pandemic. DfT understood there is scope to go to 4 years, particularly when National Travel Survey (NTS) is limited in light of the pandemic, but at the same time there are benefits to sticking to previous plans for regular updates and not being erratic with updates.
- 2.132 There were some questions on land use data availability and that in modern times with most things being GIS based, data scraping is easier than 5-10 years ago. This would be beneficial to improve the attraction end.
- 2.133 DfT informed the panel they have been speaking to the Cabinet Office and the Geospatial Commission about getting mapping that would be more helpful.

## Climate Change Adaptations Analysis using NTMv5

- 2.134 DfT presented some exploratory work seeking to quantify the cost of climate change for road and rail infrastructure. Climate change has the potential to have a significant adverse impact on economic activity through damage and disruption to the transport network. There is therefore a need to improve our methods and evidence to quantify these impacts.
- 2.135 Overall, JADP were supporting of DfT investigating how climate risks to the transport network could be quantified. However, they had various suggestions for further investigation including:

- Systematically mapping the potential impacts of climate change for the transport network to inform the scope of modelling;
- Considering the suitability of other tools to quantify the costs of climate change e.g. Computable General Equilibrium Models;
- Working with other organisations to develop the evidence base, for example to understand cascading failures; and
- Undertake analysis how the cost of climate change could differ under a range of scenarios.

## Long Term Impacts of Covid on Travel Behaviour

2.136 DfT presented a paper on research into changes in travel behaviour post Covid as well as recommendations on what could be done to incorporate findings into guidance. Main findings of activity-travel behaviour in short-term traffic forecasting included:

- Significant drops in travel times, regardless of the age group & gender. (Borkowski et al., 2021)
- Public transport users are 31.5, 10.6, and 6.9 times more likely to change their commuting transport mode than car users, motorcycle users, & walkers, respectively. (Dingil & Esztergár-Kiss, 2021)
- Average trips increased by 14% in 2022 compared to 2021, however still lower than in 2019 (-10%). (National Travel Survey 2022)

2.137 Based on the findings, DfT posed the following questions to the panel:

- What will happen after the pandemic is over?
- To what extent can lasting impacts of COVID-19 on travel behaviour be expected?
- Will ‘the new normal’ remain or only temporarily influence behaviour?
- If there is a lasting impact, which type of impact will result, and what will this mean for the demand and capacity of transport systems?

2.138 The panel welcomed the research and that DfT are actively looking into what needs to be done about the findings. There was a discussion on whether walking and cycling have returned to pre-COVID levels and whether preferences have shifted much.

2.139 A panel member commended the review and mentioned also looking at TRANSAS<sup>13</sup> which was notable research completed by Centre for Research into Energy Demand Solutions.<sup>14</sup> There was agreement with most of the modelling suggestions

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<sup>13</sup> <https://covid19transas.org/>

<sup>14</sup> <https://www.creds.ac.uk/>

made in the review and also important to note that most of the suggestions were robust for other reasons, not just limited to Covid.

- 2.140 A panel member mentioned the international comparisons were particularly interesting. Where restrictions were similar, so were changes in travel patterns but an example of a difference could be seen with online shopping not being as attractive in the USA compared to the UK.
- 2.141 It was also noted that there were declining trip rates before Covid for commuting, business travel and shopping and it seems Covid sped up this change. The question is whether trip rates will continue to decline. Regarding the question of re-estimation of mode choice, firstly people may have more access to cars if they are working from home and not using cars for commuting, secondly reducing public transport levels of service in response to decreased demand could impact demand further.
- 2.142 On the topic of distribution of trips across the week in the post-Covid world, do we need to build additional infrastructure, or find a way of better distributing those trips so that we don't get so many peak days (Tues -Thurs) perhaps offering incentive on Mondays and Fridays to balance out the distribution. Not having to build additional infrastructure to cope with current demand trends would be sensible from a carbon perspective.

## Summary of discussion on 18<sup>th</sup> December 2023 awayday

- 2.143 Topics for discussion at this meeting were: Appraisal and Modelling Strategy II, Public transport investments, displacements and Levelling Up, Triple Access Planning and appraisal, How AI could be used for modelling.

## AMS II

- 2.144 DfT presented a paper on their Appraisal and Modelling Strategy<sup>15</sup> (AMS) refresh. The current AMS was established in April 2019, setting out DfT's proposed intent towards development of modelling and appraisal methods and evidence base over a five-year period. This period comes to an end next Spring. DfT sought the panel's views on:

- The areas of strategic focus of an updated strategy.
- What the next AMS should include and the level it should be pitched at.
- The core themes and topics that will be important to include in the next strategy.

- 2.145 A panel member suggested Spatial Computable General Equilibrium (S-CGE) modelling to analyse rail schemes.

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<sup>15</sup> <https://www.gov.uk/government/consultations/transport-appraisal-and-modelling-strategy-informing-future-investment-decisions>

- 2.146 The panel suggested thinking about the effects of disruption (including black swan events) and productivity, tax and pricing, project costs and delayed benefits and intra-urban traffic modelling. As well as the Common Analytical Scenarios (CAS) and looking further at programmatic appraisal.
- 2.147 A panel member mentioned the end state vs path to there; timescale of adaptation matters for modelling and appraisal, as well as the mechanisms. Also, the dynamics of policy change and how people, firms and institutions react and over what timescale. It was also noted that whilst transparency has improved, the actual access to modelling has not. For example, ALBs often only share scheme specific models after the planning process, whereas the share information about more generic models more openly. This can sometimes be attributed to confidentiality issues with patronage and revenue data.
- 2.148 Another panellist highlighted the need for policy analysis to consider the interactions between energy and digital systems (with a view to a low carbon future), with implications for charging as well as distributional impacts. The use of faster, proportionate modelling to support this was suggested.
- 2.149 There was support for greater focus on resilience (although how to actually *provide* resilience can be a challenging question), urban realm and location attractiveness within the next AMS. There was appetite for more work to develop social impacts appraisal.
- 2.150 It was discussed that perhaps less engagement is needed this time round compared to the 2019 AMS. One option could be to employ RAG ratings for achieved, failed and no longer needed areas from the first AMS. Also, it was suggested that some of the activity could be done in collaboration with, or outsourced to, sub-national transport bodies (STBs) and Active Travel England (ATE). This would also build capability amongst these partner organisations.
- 2.151 It was discussed that environmental requirements, rather than appraisal valuations, have more “bite” on policy, as they are legislated. Modelling and appraisal can have less direct influence e.g. we may wish more children to cycle to school but is not possible to guarantee this as an outcome.
- 2.152 One panellists suggested social and distributional analyses can sometimes focus too much on statistical analysis and geospatial mapping, without a clear narrative or sufficient policy relevance. Environmental modelling also takes a long time and is resource intensive to do properly: the use of AI was suggested as potential tool to mitigate this.
- 2.153 A panel member suggested setting out what decisions government will be struggling with over next few years, by looking at known short term challenges, would be a good way to frame the next AMS.

## Public Transport Investments, Displacements and Levelling up

2.154 DfT presented a paper discussing the findings from research on how investment effects firm relocation, displacement and wider economic impacts. Key questions the study sought to answer were:

- Which firms move in response to new connectivity? Where to? Where from?
- Which local factors are associated with new activity and relocations?
- What are the impacts on businesses & areas – jobs, productivity?

2.155 Preliminary findings from 20 major public transport investments that were studied suggested entrants include smaller, younger firms in the digital and business services sector looking to move into areas with higher skills and less tight labour markets. Exits included medium age firms from digital and business services sectors and advanced manufacturing sectors moving away from tighter and more productive labour markets and into areas with more same-industry firms with more jobs.

2.156 The discussion focused on the role of contextual factors. It was pointed out that planning policy is important, but there is currently no consistent data that can be included in the study of several transport investments.

2.157 It was also queried how the 20 investments were selected. The 20 investments represent investments that were sufficiently large so that materialisation of WEIs is plausible and detectable. Many investments were rail schemes, which tend to create more significant capacity and symbolically act as signs of permanence. Major bus schemes were also included. Furthermore, the selection was confined to public transport schemes as the spatial range of their impacts can be better defined. Road schemes, on the other hand, have more a dispersed spatial distribution of impacts because road users are more diverse, their trip purpose (freight, commute etc), their origins and their destinations are more uncertain.

2.158 The panel also pointed out that catchments of 1hr walking times might be too large. It was confirmed that this was only the first step and that a narrower catchment will be defined as the analysis progresses.

2.159 It was also raised that intervention may be endogenous – i.e. designed in response to area booming or failing. DfT acknowledged that this might be the case but there is currently no agreed approach in the literature to fully address this problem for multiple schemes.

2.160 It was explained that the next steps of the research were a) to narrow the catchment areas to 15/20 mins walking time in order to account for more realistic walking distances of public transport users; b) extend the models to a longitudinal specification and c) link relocation to business outcomes, such employment growth, turnover and productivity.



## Triple Access Planning and Appraisal

- 2.161 The panel presented a paper on the role of digital substitution of activities within the modelling and appraisal framework. For example, if an intervention encourages some activities to become digital, how do we value the benefits and disbenefits of this within appraisal?
- 2.162 It was explained that digital connectivity can effectively substitute for travel, but also complementing other forms of access and the land-use system. The issue is complex and digital connectivity could also encourage more travel by identifying opportunities and increasing social participation. It could be a form of option value, and also have implications for the importance of agglomeration economies.
- 2.163 It was argued that TASM could consider exploring the impacts of digital accessibility across various elements of the Appraisal Summary Table, as well as considering various scenarios for how digital accessibility could affect travel in the future.
- 2.164 Some panellists argued we can model 'digital access' like an alternative mode of travel, but there would be challenges in calibrating and validating such an approach.

## How AI Could be Used for Modelling

- 2.165 DfT presented a paper on how AI could be utilised for modelling. DfT sought the panel's views on the following questions:
- How AI may impact modelling and appraisal methods?
  - The risks and opportunities to modelling and modelling capabilities from the increased use of AI?
  - What the department should do to prepare for AI in modelling and appraisal?
- 2.166 The following points were raised in regard to what utilising AI could do for the DfT: pattern recognition and prediction on existing runs, analyse model results in detail, estimate parameters, elasticities and values of time (VoT), feed data in and ask AI to build a traffic models, option generation, quicker AQ modelling, reduce gender bias in TAG and to support the role of TAG within the wider planning system.
- 2.167 The panel mentioned the need for robust data to exploit the benefits of AI. Building on this, the issue of prediction vs inference was raised, there could be a risk of overfitting and extrapolating a past trend naively.

## 3. Next Steps

- 3.1 Over the past nineteen months, the panel has worked across a range of key areas including net zero, transport & wellbeing and modelling and forecasting challenges to ensure our modelling and appraisal framework can meet the challenges of the post-Covid landscape. We discussed how to ensure our analytical toolkits remain up to date and fit for purpose so they can continue to be used effectively.
- 3.2 A key theme for the coming year is developing our successor to the Appraisal and Modelling Strategy (AMS) which was published in 2019 and sets out our priorities for the development of TAG. Our aim is to provide appraisal and modelling tools that are robust, flexible and easy to use, to support the policy and investment decisions which will be made over the next five years. Our AMS provides transparency in how we aim to achieve this in collaboration across the sector.
- 3.3 We welcome the involvement and scrutiny of JADP and hope to continue this going forward. From 2024 onwards, we have refreshed the JADP with some turnover in membership and set up the Shadow JADP (SJADP). SJADP brings together academics and professionals earlier on in their careers. We hope to inject fresh thought and innovative thinking into our work from a more diverse background. We hope to work collaboratively with both panels over the next few years.

## 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, and the Dubai Council for Future Transportation. 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 the need to adapt local transport planning to address the carbon challenge, by developing long-term transition pathways to carbon zero, and to more fully engage with trip-generating sectors.

### 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 WeITAG, which sets out the transport appraisal process used in Wales. WeITAG 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 MBE**

- 4.18 An international transport modeller and demand forecaster, Tom van Vuren combines an interest in academically sound theory with pragmatism in application to real life situations – he considers himself a ‘pracademic’. As the Regional Director for UK and Europe at Veitch Lister Consulting, with 30 years’ experience in the development, maintenance and application of large scale strategic transport models in appraisal, 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. He has held a position as Visiting Professor at the University of Leeds since 2004. He is currently the Policy Director at the Transport Planning Society.

### **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.

4.23 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. For the period of this report, it was 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 and areas for discussion will be agreed in advance before each meeting.
- 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 range of expert 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 chaired the panel with Professor Peter Jones for the period covered by this report.
- 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.

Contact details  
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## 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.