Approaches to demand futures

Making better use of scenarios in understanding future travel demand

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Hypothesis: A key problem in predicting future demand is not the models but how we use them

- Models reflect the complex relationships between many explanatory variables

- Of course they can be improved
  - More segmentation reflecting range of behaviours across the population
  - More behavioural, incorporating attitudes, habits, influence of peers, etc.
  - Better data, including use of ICT, etc.

- But it is also the inputs to these models that can have substantial impacts on the future forecasts, e.g.
  - Fuel prices
  - New travel alternatives / business models, including options for not travelling
  - Future income levels and their distribution across the population
  - Employment levels, types of employment and their locations
  - New technologies, Autonomous vehicles, next generation ICT services, big data / apps, Internet of Things, Advanced manufacturing …..

- **There is substantial uncertainty in making future projections**

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That doesn't mean we shouldn't use models – but we need to use them differently

- To explore how proposed investments or policy interventions perform **across the wide range of future scenarios**

  - Not just 3 or 5 scenarios, but tens or hundreds of scenarios, taking account of uncertainty in key variables

  - Not seeking solutions that maximises an outcome, in one or a small number of scenarios, but rather solutions that are **robust** across the range of futures

  - If such solutions are not possible, then such analysis can help understand

    - What are the conditions where our proposed solutions are <u>not</u> good ones

    - How decisions can <u>shape</u> the likelihood of certain plausible futures unfold

    - Actions that are needed to <u>mitigate</u> negative impacts from certain plausible futures

    - The possibility for <u>adaptive</u> strategies – i.e. those that can evolve in response to new information about how the future is unfolding

    - Key <u>signposts</u> that can help indicate whether a given future is more or less likely

    - <u>Hedging strategies</u> – i.e. actions that, to be effective, must be implemented in

Such "Robust Decision Methods" are used in many other sectors

- Planning for water infrastructure given climate uncertainty
- Coastal resilience
- Energy infrastructure planning
- Responses to infectious disease

- We can learn from these!

Conclusions

- We need models to help us choose amongst alternative strategies – they describe the complex relationships between many variables

- These need continual improvement to help us understand the impacts of factors on travel demand

- But we need to acknowledge that there is substantial uncertainty in how the future may play out – and many factors that we cannot predict

- We should take account of these by exploring how proposed policy interventions perform across a wide range of future scenarios

- We should move away from solutions that maximise an outcome to ones that perform well across a range of futures

- Such analysis should be the starting point to help guide policy needs

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