# IS TRANSPORT PLANNING FIT FOR PURPOSE?

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## 1 INTRODUCTION

Transport planning to those outside the profession may be invisible or misconstrued, yet for those on the inside we see its significance to each and every person in society. For me, transport planning is about developing the transport system and its use in a way that supports and shapes the sort of society that we want (Lyons, 2004). Transport has always influenced society. Yet as a recognised profession, transport planning is still in its infancy. The Institution of Civil Engineers this year is celebrating 200 years since it was founded. The Transport Planning Society (TPS) has reached its 25th anniversary. 2018 marks a mere 10 years since the Transport Planning Professional (TPP) qualification was launched.

Our young profession has grown up in turbulent times. The 1998 Transport White Paper was a landmark rejection of the paradigm of predict and provide suggesting a new dawn. A decade later the global financial crisis decimated the ranks of transport planners just as the TPP was being born. A decade further on and the ranks have been replenished and transport planning has grown in stature alongside growing emphasis on infrastructure investment. Over 200 people hold the TPP with many more on a journey towards it. Yet over the course of the last two decades, strong winds of change have been blowing. The invention of the web in the 1990s was a key catalyst that propelled the new digital age – one which has collided and merged with the motor age, an age that set the foundations for transport planning as a discipline. The peak car phenomenon (Goodwin and Van Dender, 2013) has been symptomatic of new dynamics affecting transport and society. Young people's travel behaviour has been changing – the proportion of 17-20 year olds in England with a full driving licence in 2014 was 29% compared with 48% in 1992/94 (Chatterjee et al, 2018). Alongside this, a powerfully seductive repertoire of technological innovation is suggesting that the future *may* be one of connected, electric, autonomous and shared mobility.

Stemming from the context above, this paper charts a more recent journey I have had the privilege of taking into the matter of whether or not transport planning is fit for purpose and, if it is not, what needs to change. Suffice to say at the outset that the conclusion reached is that the status quo is not an option.

Following some further elaboration of the context for the paper's title question, the paper then sets out what the purpose of transport planning is understood to be. It considers two contrasting policymaking pathways for transport planning to be part of and support before then summarising the views of 200 transport professionals on these matters. The need for change becomes readily apparent and this includes the importance of rethinking robustness in transport analysis. Ensuring transport planning

is fit for purpose is incumbent upon all of us within the profession and one focal point for this is the TPP. Before concluding, the paper briefly reflects upon a 10-year review of the TPP and what its stakeholders have to say.

## 2 TODAY'S CONTEXT FOR TRANSPORT PLANNING

I had the privilege a few years ago of working with Dutch colleagues with a background in socio-technical studies and who specialise in innovation. We co-edited a book (Geels et al, 2012) centred upon the possibility that the motor age – something we called the 'automobility regime' – might be destabilising and transitioning towards a new regime. The book was framed by two guiding questions: (i) will we see a greening of cars, based on technological innovations that sustain the existing car-based system?; or (ii) is something more radical desirable and likely, such as the development of travel regimes in which car use is less dominant?

Inspired by a combination of the experience above, research insights into how telecommunications and travel interact, and the peak car phenomenon, I set out my own hypothesis that society was indeed "undergoing a fundamental transition from a regime of automobility to something significantly different" (Lyons, 2015: 1). Such transitions are *processes* not events and can take decades to unfold. That we may be in the midst of such a transition (I would suggest a decade or even two into it) would help explain the deep uncertainty currently faced.

Figure 1 below is compiled to help illustrate this hypothesis at a high level (using data for the USA).

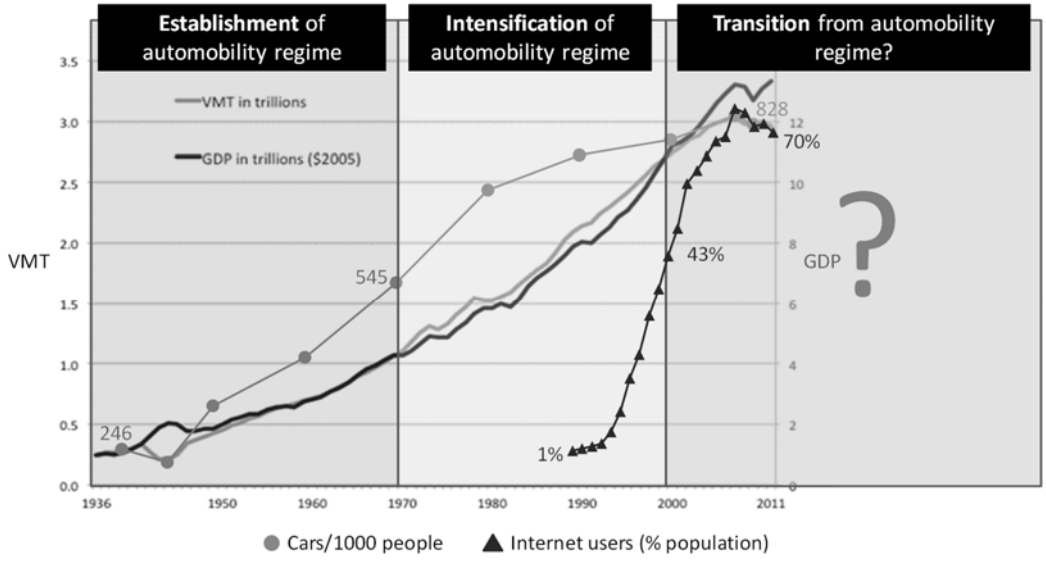


Figure 1. The automobility regime and an unfolding transition towards a new regime
(Data for the USA: VMT (auto and truck vehicle miles travelled - trillions) and GDP (trillions of $2005) – graph reproduced from (Ecola and Wachs, 2012: 7); Cars/1000 people – data from (Dudley, 2014); Internet users (% population) – data from the World Bank - https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=US)

Following a transition in the early decades of the 20th Century from the regime of horse-drawn transportation, the automobility regime began establishing. The regime has been characterised by, what might be loosely referred to as, the 'two laws of transportation': (i) road traffic keeps on growing; and (ii) economic activity and road traffic activity are closely coupled – one cannot have one without the other. The latter intensified somewhat as a feature of the automobility regime from the 1970s onwards – i.e. road traffic grew at a greater rate than growth in economic output. However, from around the start of the new millennium, the two laws of transportation have (at least temporarily) broken down – road traffic stopped growing and road traffic and economic activity began decoupling. Superimposed upon the Figure are the two S-curve developments: the rise in the number of cars proportionate to population; and the later and much steeper appearance of, and rise in, internet access. These more recent developments *may* be symptomatic of a transition away from automobility (as it has been known) being underway.

We are facing what could be seen as unparalleled developments spanning social, technological, economic, environmental and political drivers of change. Making sense of cause and effect is difficult if not impossible, underlining a sense of deep uncertainty about the future. The UK Department for Transport's national road traffic forecasting has acknowledged that "[c]learly forecasts of the inputs [to the National Transport Model] are very uncertain" (DfT, 2015: 55). The National Infrastructure Commission, in setting out its priorities for national infrastructure, "recognises the high levels of uncertainty which surround the decisions that need to be taken over the next thirty years" (NIC, 2017: 34). The Commission on Travel Demand, having taken evidence from around the UK, has concluded that "the assumptions which have, until now, underpinned thinking about growth in travel have missed some key societal developments" (Marsden et al, 2018: 9).

We are in times of change. With deep uncertainty and the prospect of regime transition, it is reasonable to bring into question whether our approach to transport planning that has its roots in the automobility regime is any longer fit for purpose. Indeed it may be suggested that the professional standing of transport planning is at stake if we are unable to address this. Oxford Dictionaries' 'Word of the Year' for 2016 was *post truth* whose use it illustrates as follows: "in this era of post-truth politics, it's easy to cherry-pick data and come to whatever conclusion you desire"[1]. Doubt has been cast upon the role of experts (read 'professionals') – notably in 2016 by the then UK Government Justice Secretary Michael Gove who said (in relation to Brexit) "people in this country have had enough of experts"[2].

## 3 WHAT IS TRANSPORT PLANNING'S PURPOSE?

We have, then, a young profession facing changing times and with a need to ensure it remains fit for purpose. This then prompts a need to consider what that purpose is. This can be answered at different levels of detail and from different perspectives. In the simplest of terms, my own view is that transport planning concerns *providing*

[1] https://en.oxforddictionaries.com/definition/post-truth
[2] https://www.ft.com/content/3be49734-29cb-11e6-83e4-abc22d5d108c

*(support for) stewardship over a better future for society and the role that transport has within this*. 'Better' is value laden and different actors in the transport planning system will have different interpretations of what 'better' constitutes. It could be considered that transport planners should be subservient to their political masters such that the latter determine stewardship, with transport planners dutifully fulfilling their supporting role. Yet professional integrity should surely call for a wish that transport planners (also) be able to give frank, robust and honest advice with a goal of evidence-based policy-making rather than policy-based evidence-making. While preserving the anonymity of the sources, the following two quotes help further endorse this notion of purpose: "you didn't give us what we wanted… you gave us what we needed…" (transport planning client); and "transport planning should be about giving the best advice you can, even if the client does not want to hear it" (transport planner).

### 3.1 From predict and provide to decide and provide

In 2014 I had the privilege of being seconded to the New Zealand Ministry of Transport as Strategy Director, responsible for examining uncertainty in future demand for car travel and its implications for policymaking and investment. At a personal level, this was an opportunity to shine a light upon how we could or should approach stewardship of the future.

The centrepiece of a series of elements to this undertaking was a scenario planning exercise with stakeholders and experts. It exposed the uncertainty in future demand through identifying two critical uncertainties: (i) societal preference for how to gain access to people, goods, services and opportunities in future, ranging from physical to virtual; and (ii) affordability – represented by the relative cost of energy ranging from high to low. Four plausible scenarios were produced and a simple spreadsheet model was developed to generate estimates of change in total car travel (measured in vehicle distance travelled) from 2014 to 2042 for each of the scenarios. Across the four scenarios the change in total car travel ranged from +35% to -53%. Rarely if ever has an official national road traffic forecast anywhere in the world indicated decline rather than growth. The results of the exercise were therefore highly thought provoking. However, we were left with the 'so-what?' question. How did this help inform thinking regarding the approach to transport planning, policymaking and investment?

The key conclusions from the Ministry's study were as follows (Lyons et al, 2014):

- access not mobility is key to a thriving society;
- there is a need for resilient provision of access that provides for adaptability of behaviour over time; and
- there should be a focus on evolving our transport system for the demand we believe to be appropriate rather than that which we are tempted to predict.

Further work was undertaken to elaborate on these conclusions resulting in a paper addressing how to handle uncertainty in transport planning (Lyons and Davidson,

2016). The paper put forward two alternative policymaking pathways. The first it called *regime compliant* – a pathway "in which adherence to trends and the nature of the world we have known pushes policy". The second it called *regime testing* – a pathway "in which the nature of the world as we have known it is brought into question and vision pulls policy decisions" (Lyons and Davidson, 2016: 104). The two pathways are outlined in Figure 2. This is offered as a learning aid, rather than to suggest that in practice pathways are as linear or a simplified as this.

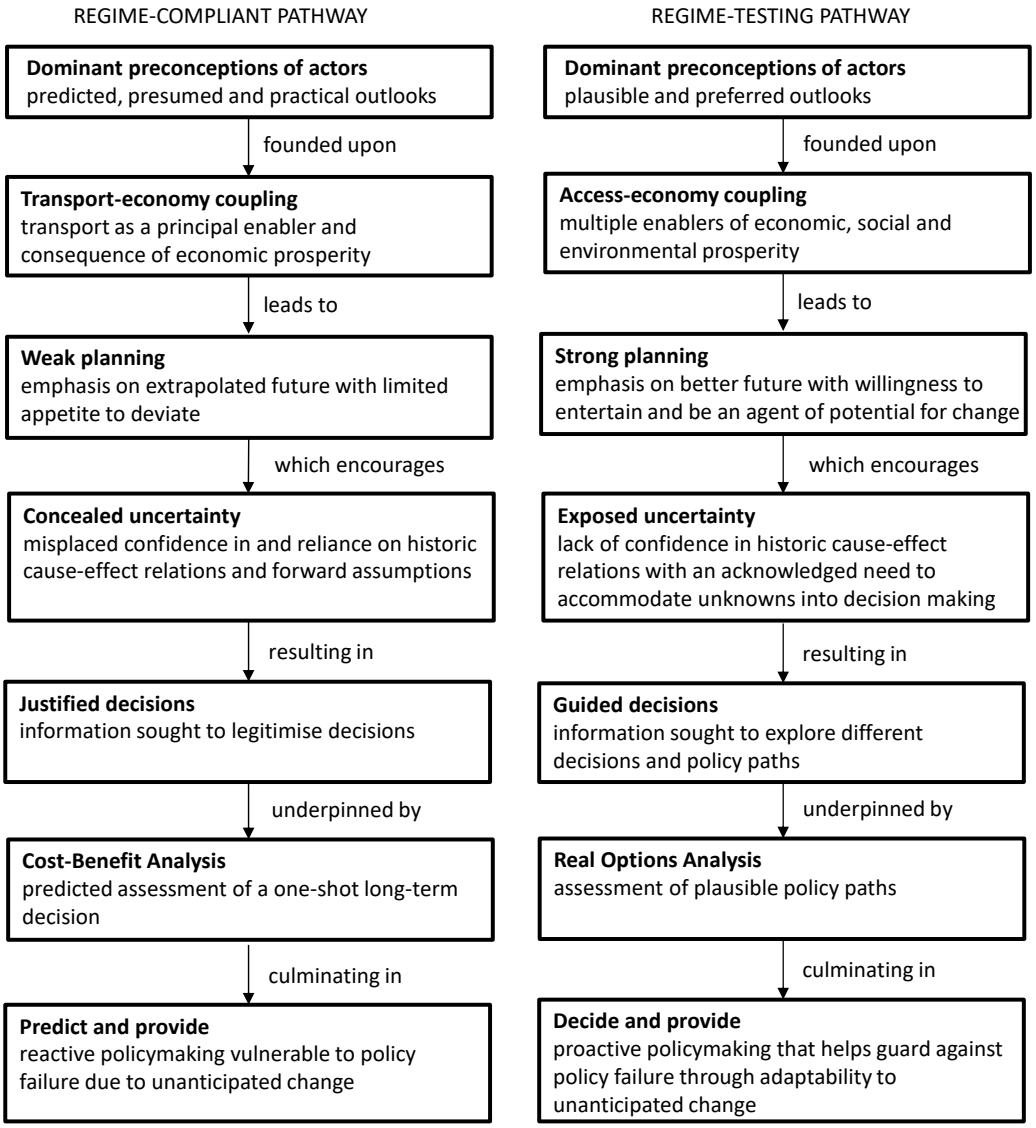


Figure 2. Policymaking pathways (reproduced from Lyons and Davidson (2016: 114))

The regime-compliant pathway culminates in *predict and provide*, reflective of reactive policymaking vulnerable to policy failure due to unanticipated change. Meanwhile the regime-testing pathway culminates in *decide and provide*, reflective of proactive policymaking that helps guard against policy failure through adaptability to unanticipated change.

In my view, regime-compliance dominates much of current practice and, especially in the face of the circumstances in which transport planning operates, it is not fit for purpose. I believe there is a greater need for a regime-testing approach. Is this a view shared by others? The opportunity arose to explore this back in the UK through the Chartered Institution of Highways & Transportation (CIHT).

## 4 WHAT DO TRANSPORT PROFESSIONALS THINK?

A series of 11 one-day workshops across the different regions of the CIHT in the UK took place from late 2015 to early 2016 and in total involved just over 200 CIHT members (including many transport planners but encompassing a wider cross-section of transport professionals).

The participants were asked to explore their views on future uncertainty and the plausibility of the four scenarios developed in the NZ Ministry of Transport work described above – when considered for the UK. They were then engaged in examining the two policymaking pathways shown in Figure 2 and asked: (i) what pathway do you feel policymaking and investment is currently on, and why?; and (ii) what type of pathway should we be on, and is it practical to try to achieve this?

Full insights from the initiative – called CIHT FUTURES - can be found in Lyons (2016). An exercise was undertaken where participants each had eight plausibility credits to assign across the four scenarios to indicate, in relative terms, how plausible they considered each scenario to be. In summing up the results across the participants across all the workshops, the percent share of plausibility credits assigned to each scenario ranged from 19% to 29%. This underlined the plausibility of all four scenarios. Notably (and notwithstanding the simplicity of the exercise), the scenario collectively deemed least plausible was that with an estimated 35% growth in total car travel (vehicle distance travelled). The scenario deemed most plausible was that with an estimated 53% *decline* in total car travel. Transport professionals (or at least the participants concerned) recognise the deep uncertainty faced and are prepared to entertain significantly different plausible futures.

What emerged was the notion of what I have termed a *professional comfort formula*: the more comfortable a professional feels about the plausibility of significantly different futures, the less comfortable they feel about following the (regime-compliant) processes in their day job and vice-versa (see Figure 3 below).

$$C_{psdf} \propto \frac{1}{C_{pfdj}}$$

where:

$C_{psdf}$ is the level of comfort with the plausibility of significantly different futures; and

$C_{pfdj}$ is the level of comfort with processes followed in the day job.

Figure 3. Professional comfort formula (reproduced from (Lyons, 2016: 27))

In terms of transport professionals' views regarding the two alternative policymaking pathways, the message was very clear. Overwhelmingly, workshop participants recognised that current practice in transport planning relates strongly to a regime-compliant approach (notwithstanding some exceptions in practice). Likewise, there was a widespread view across the workshops and their participants that regime-compliant transport planning was *not* fit for purpose and that we should move more towards, if not right across to, a regime-testing approach. There are of course contextual factors that would nuance such views in any given circumstance. There was also a view by some that a combination of regime-testing and regime-compliance would have merit, not least because a wholesale move to regime-testing could be too difficult to achieve or at least achieve immediately.

Insights from this exercise gave light to what I have referred to in the report as professional impotence – a sense of "the transport sector being on the back foot in relation to change and uncertainty with the lack of a national transport strategy and a lack of skills within the transport profession to embrace change and confront the uncertainty faced" (Lyons, 2016: 6). Individuals expressed a wish to see change but felt they lacked the agency to bring about that change in a system characterised by (expectation of) regime compliance. There was a feeling that the balance of emphasis in transport planning was more in favour of *accountability* to procedures, due process and dogma rather than *responsibility* for stewardship over creating a better future. There was concern over inertia holding back change, attributable to: familiarity with the orthodox approaches; limited / directed resources; a 'rear-view mirror' mentality; unconscious biases; vested interests; risk aversion; and the profession's skills mix.

The overarching message from this exercise was very clear: transport professionals are not convinced that transport planning is currently fit for purpose.

## 5 A NEED TO RETHINK ROBUSTNESS IN TRANSPORT ANALYSIS

In my view – and something I had the opportunity to express at the Modelling World 2018 conference – ensuring transport planning is fit for purpose is in part about being clear on what constitutes analytical robustness. Robustness is defined as "the ability to withstand or overcome adverse conditions or rigorous testing" [3]. For transport analysis I would suggest *adverse conditions* concern the deep uncertainty we are facing alongside possibly being in the midst of regime transition. *Rigorous testing* reflects the fact that analysis may well be coming under greater scrutiny with regard to being able to demonstrate its robustness.

The following six aspects of robustness I consider important:

Recognising the nature of the problems being addressed: Many problems in transport analysis are complex and challenging to solve; but they are soluble – for instance the travelling salesman problem or system optimisation of traffic assignment in relation to travel time for a fixed O-D matrix of trips. However, another class of problems are

[3] https://en.oxforddictionaries.com/definition/robustness

those known as 'wicked'. "A wicked problem is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize"[4]. Head considers such problems to be "marked by value divergence, knowledge gaps and uncertainties, and complex relationships to other problems" (Head, 2010: 21). Wicked problems are resistant to resolution. In our transport analysis we must be more mindful of the distinction between complex and wicked problems if we are to better appreciate how to deal with problems of the latter sort. Such problems include many aspects of future mobility, e.g. valuing time, handling uncertainty, making mobility 'smart', effective automation of transport and changing travel behaviour. Indeed, forecasting (a central feature of transport analysis) is at the mercy of what Harari refers to as level two chaos - "chaos that reacts to predictions about it, and therefore can never be predicted accurately" (Harari, 2014: 268).

Bringing different people together in addressing the problems: Roberts (2000) distinguishes between three strategies for coping with wicked problems: authoritative; competitive; and collaborative. She suggests that in the case of an authoritative approach, responsibility is put in the hands of a few stakeholders vested with the authority to come up with a solution (with the possibility of being (seen to be) wrong about the problem and wrong about the solution). A competitive approach sees different constituencies and perspectives working separately to offer insights. Meanwhile a collaborative approach enables different constituencies and viewpoints to work together towards improved accomplishment. A distinction can be made between 'experts at' and 'experts on' when considering how problems are addressed. Experts *at* addressing a topic are the incumbent providers of advice - those routinely consulted; those vested with authority. Meanwhile there may be other sorts of experts *on* the topic who are never, or rarely, turned to for their advice. Robust transport analysis involving wicked problems should seek to take a collaborative approach that brings 'experts at' and 'experts on' together. This can create strength through diversity of perspective, helping overcome unconscious bias that may otherwise compromise the analysis and its interpretation.

Distinguishing between number crunching and storytelling: It is now seen as a myth that the two sides of the brain are neatly distinguishable (the left hand being for logic, detail and analysis and the right-hand for spontaneity, creativity and subjectivity) and with one side of the brain dominating. It is not as clear-cut and straightforward. Yet it does seem possible to distinguish at some level between what could be referred to as number crunchers and story tellers – something elaborated upon by Damodaran (2017). He suggests that: (i) number crunchers believe analysis "should be about numbers and that narratives/stories are distractions that bring in irrationalities"; while (ii) storytellers believe that analysis "is really about great stories and that it is the height of hubris to try to estimate numbers, when you face uncertainty"[5]. At the level of the individual it may be that people can identify with being both or may recognise in themselves a leaning towards being one or the other. In any case, this

[4] https://en.wikipedia.org/wiki/Wicked_problem
[5] http://people.stern.nyu.edu/adamodar/pdfiles/country/narrative&numbers.pdf

consideration is pertinent to robustness: pertinent to whether quantitative analysis is always superior to qualitative analysis; and pertinent to how analysis and its results are communicated to others. I would suggest that transport analysis will be better off – more robust – if we can respect the different roles number crunching and storytelling have in analysis and use them in combination to enhance robustness.

Ensuring transparency: Damodaran also distinguishes between being 'transparently wrong' and 'opaquely right' in analysis[6]. If transport analysis is under scrutiny then it cannot hide behind assumptions. There is an importance to being able to demonstrate how, and with what caveats, results are produced and conclusions arrived at. For example, if a benefit-cost ratio is revised upwards in an appraisal, how has this come about in analytical terms in the overall context of handling an uncertain future? Complicated modelling faces the challenge of transparency since it may be difficult or impossible to allow others to 'look under the bonnet' or to make sense of what they see when they do. Yet it seems important to endeavour to address this in the interests of robustness. In the work described above in Section 3.1 for the NZ Ministry of Transport, we made the spreadsheet model (used to estimate future levels of car traffic in the different narrative scenarios) available in the public domain. This allows others to look under the bonnet, question and change the inputs/assumptions and to see what happens to the results when this is done.

Recognising the importance of breadth as well as depth: When employing 'heavyweight' modelling tools to undertake analysis, there has been a tendency (not least because of computer processing power and lengthy model run times) to ration the number of scenarios that are considered and to devote more in-depth analysis to such scenarios at the expense of a wider set of scenarios. Yet, faced with uncertainty and wicked problems, this may be a misguided strategy in terms of analytical robustness – scenarios may be overlooked that in practice could have a bearing upon the advice given to decision makers concerning the merits of different courses of action. Meanwhile the challenges of making sense of cause and effect in a period of potential regime transition could in any case bring into question the veracity of the in-depth analysis and its underlying assumptions. As such, breadth of analysis may have as much importance as depth, if not more so – a role for simplified tools that can examine many more scenarios in less detail to offer a form of horizon scanning that can help accommodate inherent uncertainty.

Prioritising accuracy over precision: In an ideal world, analysis would be both accurate and precise. Yet faced with the territories already outlined of wicked problems and level 2 chaos, it seems accuracy is something hard enough to achieve and that the place for precision is brought into question. Precision is only helpful where it can play a part in ensuring analysis is as accurate as possible or that the analysis and results can be transparently portrayed to others. What runs counter to robust analysis and will surely eventually play into the hands of those who would wish to question the value of experts is false precision bias: representation of analysis that implicitly or explicitly seeks to convey an exaggerated degree of robustness and authority of the

[6] ibid

analysis and confidence in it to others. Forecasting and appraisal is a territory exposed in this regard. To date, it has been the norm in forecasting to produce a central projection with one or more high and low variations either side, reflective of sensitivity to uncertainty. In turn the central projection assumes the status of the *most likely* outcome – in spite of the acknowledged uncertainty. This central projection can form the basis for assessing the benefit-cost ratio of a transport scheme where BCR values are produced to two decimal places. Transport analysis and its reporting should call out instances of false precision.

The issues above are not new and yet their saliency I believe has increased and hence they now merit closer attention.

## 6 STAYING PROFESSIONAL – EVOLVING THE TPP

Box 1 below reproduces one of the recommendations from the CIHT FUTURES initiative described in Section 4.

*Those responsible for overseeing and supporting relevant professional qualifications should look to establish whether candidates can demonstrate both an awareness and application of the regime-testing approach and a capacity to challenge dogma.*

The CIHT and Transport Planning Society should consider a critical review of the skills areas for which competencies are examined for the Transport Planning Professional qualification. Such a review might question how skills areas are interpreted and in turn how competencies are developed in individuals and whether sufficient challenge to dogma and encouragement to contemplate regime testing thinking is apparent or expected. It would be appropriate to directly engage universities in any such review. Similar consideration would be appropriate for other professional qualifications.

Box 1. Recommendation from CIHT FUTURES (Lyons, 2016).

This recommendation has been responded to by the TPP's Professional Standards Committee (PSC) (upon which I sit) with the support of the joint CIHT/TPS Partnership Management Group (PMG) which presides over strategic and policy issues relating to the TPP qualification. At the beginning of 2018, I was responsible for facilitating five roundtable workshops spanning different TPP stakeholders and for preparing a report of my findings with recommendations to PSC. At the time of writing, the report of this 10-year review of TPP is being finalised for sign-off. It is therefore not appropriate to enter into detail in this paper, aside from providing the overview below.

The workshops examined stakeholder reactions regarding: (i) the timeliness of reviewing the TPP; (ii) whether and how the competencies of a transport planner, as set out in the TPP in terms of both their specification and related guidance, need revising; and (iii) the need to give greater emphasis to constructive challenge within the TPP qualification. Constructive challenge can be understood to mean: *a capacity and willingness to question the appropriateness or robustness of orthodox approaches, consider how they might be improved or how alternative approaches might (also) be introduced*. In light of such insights as those outlined in this paper, there was broad consensus that: (i) it was indeed timely and appropriate to review

and revise the TPP; and (ii) greater emphasis on constructive challenge should be encouraged within any revision of the TPP. This presents the prospect for a significant evolution of what is now an established qualification.

## 7 CONCLUDING REMARKS

In this paper I have sought to share the personal journey I have been on in relation to addressing the question of whether or not transport planning is fit for purpose and, if it is not, what to do about it. I am of course not alone in giving attention to these important matters. The transport planning profession seems alive to the crucial role it has to play in a changing and uncertain world in which there are potentially transformative implications over time for the transport sector. Yet to fulfil that role to the best of our collective ability requires that we respond appropriately to the winds of change. The short answer to this paper's question in my view is 'no' – transport planning is not fit for purpose (or certainly not as fit overall as it might be). This is not to suggest that the profession does not embody considerable capabilities, tools and techniques. However, these are no longer sufficient if we wish to have agency and influence in the effective stewardship of society's future.

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