Institution: University of the West of England, Bristol		
Unit of Assessment: 13		
Title of case study: Equipping transport planners and decision makers to cope with uncertainty		
Period when the underpinning research was undertaken: 2002 - 2018		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Glenn Lyons	Professor of Future Mobility	2002 – present
Kiron Chatterjee	Associate Professor	2003 – present
Period when the claimed impact occurred: 2014 - 2020		
Is this case study continued from a case study submitted in 2014? No		

1. Summary of the impact

The University of the West of England's (UWE) Centre for Transport and Society has contributed significantly to a shift in attitudes and professional practice within transport planning and policy making, both in the UK and globally. Its research has enabled the profession to respond to unprecedented dynamics of technological innovation and behaviour change, and considerable uncertainty about the future. The research has led to:

- changes in government perspective in countries including New Zealand and the UK around uncertainty and the need to address it;
- changes in strategic planning behaviour in national and city-region governments, improving resilience;
- the development, adoption and sector-wide sharing of a new vision-led planning approach to uncertainty offered by a global engineering consultancy and used by transport authorities spanning four continents;
- application of the approach to planning of new development sites;
- a comprehensive review of, and revisions to, the professional competencies expected in transport planning practice.

2. Underpinning research

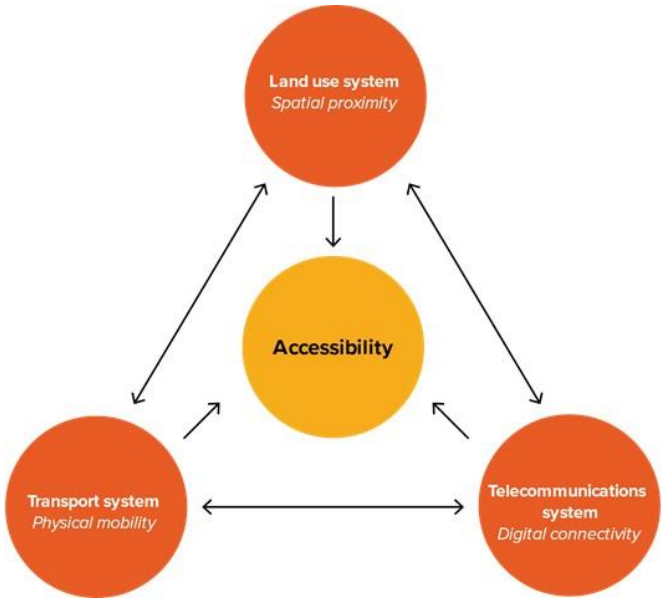
Since 2002, Glenn Lyons, Kiron Chatterjee and other colleagues at the Centre for Transport and Society (CTS) have been examining the direct and indirect effects of the digital age on travel behaviour and transport planning.

Following the advent of the Web, EPSRC-funded CTS research (2003-2006) showed how digital connectivity introduced new ways of gaining access to people, jobs, goods, services and opportunities alongside physical connectivity through transport (**G1**). In relation to both forms of connectivity, CTS research challenged the established mentality in the transport profession of connectivity *serving* society (demand-led supply - provide what is predicted to be needed). CTS contributed to a growing realisation that connectivity *shapes* society (supply influences demand) and should indeed be developed in such a way that it *supports* society (supply that helps shape a preferred future). In short, connectivity and society are co-evolving and strongly intertwined (**R1**).

This understanding of co-evolution was key to CTS contributions to several transport futures exercises during its first decade of existence. An ESRC-funded study (2009-2013) with sociologists examined how technologies outside the immediate purview of transport (e.g. refrigeration or monitoring devices) could influence social practices and thereby *indirectly* influence travel demand (**G2**). This revealed that if transport policies are being developed to limit, change, or reduce people's travel, then *non-transport technologies* may thwart

transport policy ambitions in unanticipated ways.

Working with other researchers in the UK and the Netherlands, CTS applied the 'Multi Level Perspective' (a framework for examining stability and change in socio-technical systems) to explore how the digital age was affecting the transport sector (and particularly the regime of automobility) (**R2**). The hypothesis was set out that we are in the midst of a fundamental regime transition away from the motor age, towards a future for mobility that is much more significantly defined by the digital age (**R3**). Evidence of a regime transition was highlighted by empirical research (2016) funded by the Department for Transport (**G3**) showing generational change among young people and their travel behaviour (using cars far less over time), which could be explained by digital technology and other interacting factors such as having children later, less-secure jobs and reduced home ownership (**R4**).



Being in a process of transition (exacerbated now by the pandemic) causes deep uncertainty that must be addressed in forward planning. In several projects, CTS has applied the methodology of scenario planning in which plausible and divergent future states are developed against which to test policy thinking. Scenario planning can be remote from policymaking and investment decisions, and CTS has worked (through Lyons on part-time secondment, 2014-15) with the New Zealand Ministry of Transport (**G4**) to address this by putting forward a new transport planning paradigm called 'decide and provide' (**R5**). The paradigm emphasises the importance of 'triple-access planning' (see right) in place of transport-only planning. Moving away from the forecast-led paradigm of transport planning (the 'predict and provide' model), decide and provide is a vision-led paradigm: decide on the preferred future and then provide a means of working towards it that can, through scenario planning, accommodate deep uncertainty. A national workshop-based study (2015-16) led by Lyons for the Chartered Institution of Highways & Transportation (**G5**), referred to as CIHT FUTURES, engaged with over 200 UK transport professionals and revealed strong support for a shift in transport planning towards decide and provide (**R6**). Lyons was appointed to the Mott MacDonald Chair in Future Mobility at UWE from the start of 2018 (seconded for half his time into this global consultancy firm) to help bring about such a shift.

3. References to the research

R1 Lyons, G. (2004) Transport and Society. *Transport Reviews*, 24(4), pp 485-509. http://dx.doi.org/10.1080/0144164042000206079

R2 Geels, F., Kemp, R., Dudley, G. and Lyons, G. (Eds) (2012) *Automobility in Transition? A Socio-Technical Analysis of Sustainable Transport*. New York: Routledge. Available on request.

R3 Lyons, G. (2015) Transport's Digital Age Transition. *Journal of Transport and Land Use*, 8(2), pp 1-19. http://dx.doi.org/10.5198/jtlu.v0i0.751

R4 Chatterjee, K. *et al*. (2018) *Young People's Travel – What's Changed and Why? Review and Analysis.* Report to the Department for Transport. http://eprints.uwe.ac.uk/34640/

R5 Lyons, G. and Davidson, C. (2016) Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, pp 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

R6 Lyons, G. (2016) *Uncertainty Ahead: Which Way Forward For Transport?* Final Report from the CIHT FUTURES Initiative, Chartered Institution of Highways & Transportation, August, London. http://www.ciht.org.uk/en/knowledge/futures/

Evidence of the quality of the supporting research

G1 Lyons, G. *INTERNET: Investigating New Technology's Evolving Role, Nature and Effects for Transport*, EPSRC, 2003 – 2006, £202,187.

G2 Lyons, G. *The impact of non-transport technologies on travel demand*, ESRC, 2009 – 2013, £171,039.

G3 Chatterjee, K. *Young people's travel behaviour*, Department for Transport, 2016, £98,615.

G4 Lyons, G. *Strategy Director secondment to investigate future demand*, Ministry of Transport (New Zealand), 2014 - 15, £36,432.

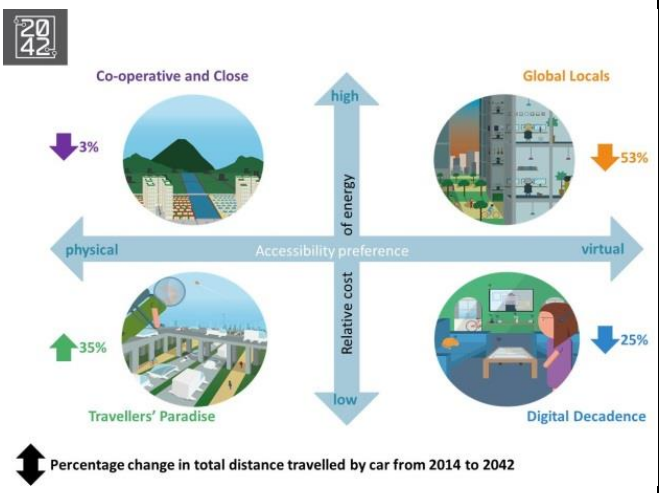
G5 Lyons, G. *Future Uncertainty in Transport - Understanding and Responding to an Evolving Society*, Chartered Institution of Highways & Transportation, 2015 – 2016, £14,850.

4. Details of the impact

In the face of a transition taking place in the mobility system, research by UWE's Centre for Transport and Society (CTS) has contributed significantly to shifting attitudes and professional practice within transport planning and policy - equipping transport planners and decision makers to cope with uncertainty.

Changes in government perspective

Supported by CTS research, the New Zealand Ministry of Transport, for the first time, in 2014 completed a strategic scenario planning exercise (illustrated right) - as part of examining uncertainty in future demand for car travel (**S1**). This contributed in turn to the country's Transport and Industrial Relations Select Committee undertaking an inquiry into the 'Future of New Zealand's Mobility', which subsequently reported in August 2017. Meanwhile, the Ministry's work (led by Glenn Lyons on secondment from UWE) brought about a change in perception over the Ministry's stewardship of the future. The then Deputy Chief Executive, New Zealand Ministry of Transport noted:



> '*thanks to the richness of research insights … harnessed through Glenn's secondment, we have changed significantly the mindset within the Ministry on engaging with the future. We have also strengthened the thought-leadership standing of the Ministry at a time when multi-billion dollar investment decisions are being made in New Zealand that will shape our future*' (**S2**, p3).

With transport and society in transition, the UK Department for Transport (DfT) in *Road Traffic Forecasts 2018* (which references **R4** – **S3**, p41) noted that: '[while] *uncertainty in road traffic demand has always existed, it is perhaps now more uncertain than ever*' (**S3**, p27). Significantly, this forecasting exercise that frames and informs policy and investment decisions in England and Wales, has moved from a fan of forecasts around a central (most likely) projection, to a set of *plausible scenarios* (**S3**, e.g. p10). Lyons has sat on the DfT's Joint Analysis Development Panel since its formation in 2015, providing strategic advice on the forecasts and focussing on how uncertainty was handled in the draft *Road Traffic Forecasts 2018* report. His advice helped shape the published report, with the Department's response to his advice detailed in the Panel's 2018/19 annual report (**S4**, p32).

Changes in strategic planning behaviour
Transport Scotland pioneered the development of a scenario planning tool and process, inspired by, and based on, the work led by Lyons in CIHT FUTURES (**G5**, **R6**) and with significant direct input from Lyons. This shaped its revised National Transport Strategy, reconciling risk and yield associated with policy measures under consideration (Strategy published in February 2020) (**S5**). Scenario analysis is, as a result, being adopted across the Scottish Government, including informing its Strategic Transport Projects Review. Director of Transport Strategy and Analysis, Alison Irvine noted in September 2020 that: '*it is a testament to the work done that as we look afresh at our strategy following COVID19 that we still feel the strategy is robust and does not require any significant change*' (**S5**).

The UK Department for Transport's Office for Science is leading the introduction of futures methods and culture change to add resilience across the Department's areas of strategic policy and investment. Lyons (in his role, on half-time secondment, as Mott MacDonald Professor of Future Mobility – see further below) is technical lead in supporting this, and work has included addressing and influencing the 2019 Williams Rail Review, support for city region strategies seeking investment from the GBP1,280,000,000 Transforming Cities Fund, developing pathways for the decarbonisation of all UK domestic transport by 2050, and development of guidance for a consistent approach to scenario analysis in transport appraisal (**S6**, p7). Mark Ledbury, Head of Transport Analysis and Strategic Modelling at DfT, notes:

> *'Glenn's research, advisory input and his constructive challenge on handling uncertainty has played a significant part in influencing the Department's thinking and practice regarding forecasting and appraisal'* (**S7**).

Transport for Greater Manchester (TfGM), informed by the CIHT FUTURES initiative (**G5**), has introduced a vision-led approach for its 2040 Strategy aligned to 'decide and provide' (**S8**). Transport for the North (advised by Lyons) has adopted 'decide and provide' for its strategic planning (as set out in its December 2020 publication *Future Travel Scenarios - Adaptive planning to deliver our strategic vision in an uncertain future*, in which Lyons was asked to write the Overview (**S9**, p16-17)). It is also being adopted by Transport for the West Midlands (where Lyons has been facilitating TfWM's Modelling Advisory Panel sessions).

Sector-wide sharing of a new vision-led planning approach to uncertainty
Mott MacDonald is a global engineering consultancy with *c*.17,000 staff and one of the world's largest transport planning teams. It sought to respond to the challenges and opportunities of future mobility by funding a Chair in Future Mobility from 2018 onwards, held by Lyons. In collaboration with UWE, Mott MacDonald has developed a six-stage approach to vision-led strategic planning for an uncertain world called FUTURES (depicted right) that embodies the 'decide and provide' methodology. Launched in April 2019, FUTURES is now offered to, and used with, clients globally (global business turnover annually is GBP1,400,000,000). Transport authorities engaging with FUTURES include those in: Seattle; New York; Abu Dhabi; Dubai; Prague; and Queensland (as well as several UK cities and regions) (**S10**). FUTURES has been placed in the public domain, to signal Mott MacDonald's encouragement and support of ongoing change in the sector (**S10**).

Application of vision-led planning to new development sites
Beyond the 'decide and provide' model now being applied by Mott MacDonald in cities nationally and internationally (**S10**), the planning and transport sector is also now adopting

'decide and provide' in place of the 'predict and provide' model. For example, Basford Powers consultancy is using the vision-led 'decide and provide' approach to advise private sector clients involved in land promotion regarding new housing developments totalling 8,500 dwellings and 6,000 jobs (**S11**). The organisation responsible for the national database of trip rates for developments used in the United Kingdom, TRICS, has commissioned and developed new guidance for their users concerning the practical implementation of the 'decide and provide' approach (**S11**).

Revision of professional competencies

Lyons' work for the Chartered Institute of Highways & Transportation (CIHT) (see Section 2 and (**R6**) and (**G5**)), led directly to a revision of the professional competencies overseen by CIHT and the Transport Planning Society (TPS).

In response to Lyons' recommendations from the CIHT FUTURES initiative (**R6**), the CIHT and the TPS – who jointly oversee the Chartered Transport Planning Professional (the only professional qualification of its kind for transport planning) – undertook a fundamental review between 2018 and 2020. This led to a revised set of professional competencies associated with the qualification to ensure that transport planning remains fit for purpose in the digital age (**S12**). The CIHT Chief Executive remarked that Lyons' recommendations '*provide CIHT, the wider sector and key stakeholders a route to facing the future with increased confidence, despite the uncertainty ahead*' (**R6**, p4).

5. Sources to corroborate the impact

S1 New Zealand State Services Commission, the Treasury and the Department of the Prime Minister and Cabinet - *Performance Improvement Framework: Follow-up Review of the Ministry of Transport, August 2014*
S2 Testimonial from the former Deputy Chief Executive, New Zealand Ministry of Transport
S3 UK Department for Transport - *Road Traffic Forecasts 2018: Moving Britain Ahead, July 2018*
S4 UK Department for Transport - *Joint Analysis Development Panel – Annual Report 2018/19, November 2019*
S5 Testimonial from the Director of Transport Strategy and Analysis, Transport Scotland
S6 Mott MacDonald – *Vision-led strategic planning for an uncertain world - FUTURES (Future Uncertainty Toolkit for Understanding and Responding to an Evolving Society), April 2019*
S7 Testimonial from the Head of Transport Analysis and Strategic Modelling, Department for Transport
S8 Testimonial from the Head of Strategic Planning and Research at Transport for Greater Manchester and 2017 Transport Planner of the Year
S9 Transport for the North - *Future Travel Scenarios - Adaptive planning to deliver our strategic vision in an uncertain future, December 2020*
S10 Testimonial from the Global Practice Leader for Transport Planning, Mott MacDonald
S11 Testimonial from Co-Founder, BasfordPowers
S12 CIHT Website news article on TTP qualification 10-year review