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PROOF OF EVIDENCE OF  
PROFESSOR LORRAINE WHITMARSH

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ON BEHALF OF  
  
GWENT WILDLIFE TRUST

In the matter of:  
Public Local Inquiry into the M4 relief road around Newport:

February 2017

## INTRODUCTION

1. I am Lorraine Whitmarsh, Professor of Environmental Psychology at Cardiff University. I gained my PhD in Psychology in 2005 from the University of Bath. I lead a research group of three researchers and six PhD students; and am the Cardiff University partner coordinator for the Tyndall Centre for Climate Change Research.
2. My research examines environmental perceptions, communication and behaviour. I have been involved with several research projects on travel behaviours (including modal choice, vehicle choice, car use and driving style), attitudes to transport technologies (e.g., electric vehicles) and policies (e.g., congestion charging).
3. Between 2011 and 2016, I sat on the Climate Change Commission for Wales, providing expertise in transport and behaviour. I have given written and oral evidence to several UK Government and Welsh Government inquiries and committees.

## SCOPE OF EVIDENCE

4. In my evidence I will describe:
  - factors which influence travel behaviour.
  - the impact on travel behaviour of road building and other transport policies, and their implications for the Wellbeing of Future Generations Act (WFG) goals.

## FACTORS INFLUENCING TRAVEL BEHAVIOUR

5. The literature on travel mode choice highlights that travel behaviours are the outcome of various psychological, social, economic, and infrastructural factors, and very often strongly habitual<sup>1</sup>. Personal preferences (for comfort, convenience, autonomy, etc.) play a role in

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<sup>1</sup> Whitmarsh, L. & Köhler, J. (2010). [Climate change and cars in the EU: the roles of auto firms, consumers, and policy in responding to global environmental change](#). *Cambridge Journal of Regions, Economy and Society*, 3(3), 427-442.

Cao & Mokhtarian, (2005). [How do individuals adapt their personal travel?](#) Objective and subjective influences on the consideration of travel-related strategies for San Francisco Bay Area commuters. *Transport Policy*, 12 (4), 291-302.

transport choices, as do less conscious determinants (e.g., identity, symbolism, status). Income and pricing of transport options are also important, as are infrastructure and availability of alternatives. Where individuals choose to switch to low-carbon alternatives to driving, this is more often out of a desire to save money or for reasons of convenience or health benefits than out of environmental concern.

6. There are various barriers to changing lifestyles that prevent awareness of transport problems manifesting in behaviour change. Institutions and infrastructures serve to lock in carbon-intensive lifestyles, including car dependency. On the social and cultural side, norms and conventions serve to reinforce the assumption that car ownership is a precondition of quality of life and the value of automobility. At the same time, the built environment has developed around – and perpetuated – car dependence, with increasingly low-density and dispersed forms of development contributing to widespread perceptions of limited (or unattractive) alternatives to driving.
7. Travel behaviour is often habitual, and as such difficult to change: individuals with strong car use habits do not consciously deliberate over travel choices or pay attention to information about alternative modes. This works against the effectiveness of information campaigns. Furthermore, where car use becomes a strong habit, individuals tend to exaggerate the poor quality of alternatives and the journey times they involve.
8. Infrastructure is critical to shaping and constraining travel choices. Urban form that has developed around roads and cars has created a strong lock-in to automobiles as the primary form of personal transport in wealthy societies.<sup>2</sup> Furthermore, changes in infrastructure can play a critical role in breaking travel habits. For example, motorway closures can force drivers to try

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<sup>2</sup> Köhler, J. (2006). Transport and the environment: the need for policy for long-term radical change: A literature review for the DTI FORESIGHT project on Intelligent Infrastructure Systems. *IEE Proc. Intelligent Transport Systems*, 153(4).

alternative modes and potentially realise they are more attractive.<sup>3</sup> Even minor changes to infrastructure such as improved signage for cycling and walking routes can impact behaviour<sup>4</sup>.

9. The impact of infrastructure investment is not always straightforward, however. Urban light rail investments to encourage modal shift away from cars have in the UK led to shift largely *between* public transport modes, thus reducing overall carbon savings.<sup>5</sup> This contrasts with other European cities where more positive impacts of new rail schemes on both car ownership and modal shift have been evidenced due to: higher-density cities, more extensive rail coverage, lower rail fares, and – critically – complementary traffic restraint measures. The review of the UK Government's Sustainable Travel Towns policy similarly concluded that the implementation of 'soft measures' (e.g., marketing, travel plans) to change travel behaviours had been limited due to failure to implement complementary measures to discourage car use<sup>6</sup>.

#### THE IMPACT ON TRAVEL BEHAVIOUR OF ROAD BUILDING AND OTHER TRANSPORT POLICIES

10. Policies to encourage sustainable mobility thus require *both* making car use less attractive ('push' measures) *and* making the alternatives more attractive ('pull' measures). The efficacy of 'downstream' interventions (i.e. changing individual attitudes/behaviours – e.g., through personalised travel planning) alone is limited without 'upstream' interventions to promote the conditions that shape desired habits<sup>7</sup>. International evidence demonstrates that *integrated* transport policies, ideally developed through public participation, are therefore most effective.<sup>8</sup>

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<sup>3</sup> Fujii, S. et al. (2001). [Changes in drivers' perceptions and use of public transport during a freeway closure: Effects of temporary structural change on cooperation in a real-life social dilemma](#). *Environment and Behavior*, 33(6), 796-808.

<sup>4</sup> Hume, C. et al. (2009). [Walking and Cycling to School: Predictors of Increases Among Children and Adolescents](#). *American Journal of Preventive Medicine*, 36(3), 195-200

<sup>5</sup> Lee, S. & Senior, M. (2011). Using Census data to examine the impacts on work mode choice and car ownership of English light rail schemes opened between 1991 and 2001. *Transport Planning and Technology* (under review).

<sup>6</sup> Sloman, L., Cairns, S. Newson, C., Anable, J., Pridmore, A. & Goodwin, P. (2010). *The Effects of Smarter Choice Programmes in the Sustainable Travel Towns: Summary Report*. Report to the Department for Transport <http://webarchive.nationalarchives.gov.uk/20111005180138/http://assets.dft.gov.uk/publications/the-effects-of-smarter-choice-programmes-in-the-sustainable-travel-towns-summary-report/summaryreport.pdf>

<sup>7</sup> Maio, G.R., et al. (2007). [Social psychological factors in lifestyle change and their relevance to policy](#). *Journal of Social Issues and Policy Review*, 1, 99-137

<sup>8</sup> May, A. D., Kelly, C. and Shepherd, S. (2006), The principles of integration in urban transport strategies. *Transport Policy* 13, 319-327.

11. Key to the current inquiry is the phenomenon of ‘induced demand’. This is where expanding road capacity generates more or longer car journeys – either because shorter travel times encourage people to travel further (and people to live further from workplaces, locking them into longer travel distances) or shift travellers from public to private modes. The concept is now widely accepted, including by the UK Department for Transport.<sup>9</sup> The converse is also evident: reducing road capacity reduces demand.
12. In the Climate Change Commission for Wales, we conducted a detailed review of transport policy and climate change in Wales<sup>10</sup>. We concluded that road building would negatively impact on climate change targets, as well as other sustainability goals (now embodied in the WFG Act). For example, road building is socially divisive for communities and negatively impacts on biodiversity. We argued that implementing the transport hierarchy is key: *avoid, shift, improve*. In other words, social, environmental and economic problems of unsustainable transport can best be avoided through finding alternatives to physical transport (i.e. ICT solutions, such as telecommuting, video-conferencing), then by shifting to less damaging modes (e.g., cycling, public transport, car-sharing), and finally by improving vehicle/fuel technologies (e.g., electric vehicles). Contrary to this, road-building continues to be priority for Welsh Government’s transport spending, with only some attention given to modal shift.<sup>11</sup> Far less attention has been given to improving transport technologies (e.g., electric vehicles) or to avoiding transport demand. Broadband, ICT and teleworking need to be seen as part of the toolkit to reconcile economic growth, carbon reduction and resilience objectives.

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Climate Change Commission for Wales (2012). Position Paper for Transport & Climate Change in Wales. <http://thecccw.org.uk/wp-content/uploads/2015/02/CCCW-Transport-Position-Paper-6-June.pdf>

<sup>9</sup> Department for Transport (1994). Trunk Roads and the Generation of Traffic. Standing Advisory Committee on Trunk Road Assessment. <http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/economics/rdg/nataarchivedocs/trunkroadstraffic.pdf>

Goodwin, P. B. (1996). Empirical evidence on induced traffic: A review and synthesis. *Transportation*. 23: 35–54.

<sup>10</sup> Climate Change Commission for Wales (2012). Position Paper for Transport & Climate Change in Wales. <http://thecccw.org.uk/wp-content/uploads/2015/02/CCCW-Transport-Position-Paper-6-June.pdf>

<sup>11</sup> <http://gov.wales/docs/det/policy/150722-ntfp15-en.pdf>

## **CONCLUSION**

13. Travel behaviour is determined by multiple factors and is often habitual. This makes behaviour change difficult, requiring both 'push' and 'pull' measures. Taken together, the evidence on behaviour change and induced demand indicates that road building is likely to discourage sustainable travel choices.
  
14. In conclusion, it is my belief that road building, including extending the M4, is likely to lead to increased demand for road transport. This will have negative implications for most or all of the WFG Act goals. Policies that provide alternatives to road transport and to transport demand altogether (e.g., ICT alternatives; improved public transport and cycle infrastructure), by contrast, are more likely to support these goals.