DYNAMICS OF ENERGY, MOBILITY AND DEMAND

# Commission on Travel Demand

Evidence Session Three

Changing Demand: Part 2

University of Leeds, 13th June 2017

Supported by RCUK End Use Energy Demand Centre DEMAND EP/K011723/

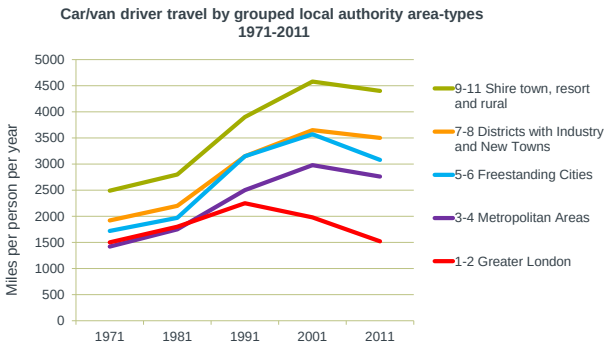
## Summary

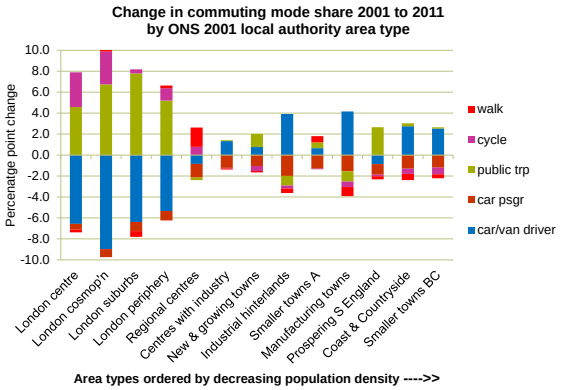
The overarching aim of the evidence session was to explore some key aspects of how demand has been changing and what might explain this as well as to continue to explore how this impacts decision-making. This note summarises some of the key outcomes of the discussion. The report does not imply consensus amongst all of the participants of the evidence session and the opinions shared, whilst not attributed, were those of the individuals rather than the organisations they belong to.

### Spatial Variation in Demand

The Commission heard evidence from England (Peter Headicar) and Sweden (Anne Bastian) looking at spatial differences in travel trends. The evidence from Sweden focussed largely on Stockholm city and the surrounding county area. In Stockholm, in the central area with congestion charging there has been an increase in walking and cycling and an increase in visits to the area. Outside of the central area, public transport has been stable and car use has fallen somewhat, particularly amongst younger males and particularly for non-commute trips. At a national level there is an increase in longer-distance commute and leisure trips. Overall trip rates have reduced in Sweden but trip distance per trip is on average growing with reductions in cities over 200,000 population offset by growth in rural areas and towns of 50,000 to 200,000. Increased specialisation of labour markets combined with some workers seeking lower cost housing outside of the urban core is suggested to be supporting the growth in longer-distance trips.

Peter Headicar's analysis of trends in car driving within England over four decades was organised by local authority area-type and showed the variation in per capita mileage across the urban/rural spectrum (see charts below). This is due to differences in car ownership and average trip length both of which can be linked to the accessibility afforded by the prevailing patterns of settlement, land use and development density. The extent of variation continues to widen although most recently this is due to differential rates of reduction in car use. More detailed analysis of commuting mode share in the decade to 2011 highlights the exceptionally large shift away from car driving within the London area to public transport and cycling (see chart). Elsewhere there is a mix of trends. The car driver share is static or falling a little in many regional centres and much of the Outer South East but has continued to rise in former industrial areas and in smaller towns and rural areas.

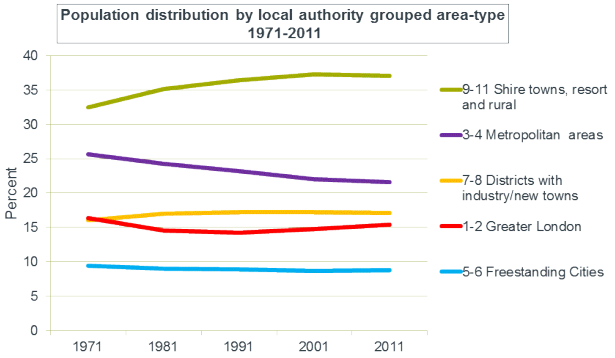


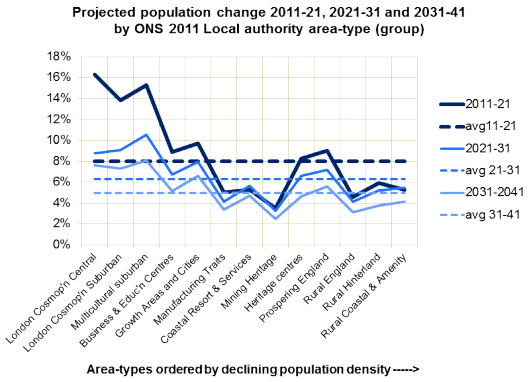




**Source: Peter Headicar – Presentation to Commission on Travel Demand**

These differences in travel behaviour take on added significance with changes in the spatial distribution of the population, especially at a time when the overall rate of growth is high by historical standards and forms a major component of national traffic forecasts. The physical longevity of the nation's building stock and the land uses with which it is associated act as a constraining influence but over time these are altered and added to by the development industry in response to changes in the volume and pattern of demand. During the 1970s and 1980s (when the overall rate of population growth was low) there was a pronounced 'counter-urban' shift in the distribution of the population which both reflected increases in car-based mobility and contributed to increases in car driver mileage (see chart). More recently this trend has been replaced by an 'urban renaissance', especially in London. This is partly attributable to much higher rates of population growth and the component of international immigration within this.

The recent trends form the basis of official population projections. These indicate above average growth within the more urbanised parts of the country and especially in London (see charts below). Given that these areas are already substantially 'built-up' the implication is of significant densification in population, development and (potentially) movement. This suggests an even greater spatial divergence in car use and transport management regimes in future.




**Source: Peter Headicar – Presentation to Commission on Travel Demand**

Land-use changes slowly and population distributions also relatively slowly and this can act as a brake on the rapidity of change. Uses and patterns of use however may change more rapidly and the balance between what seems to be structurally slow change and more rapid disruption could be better understood.

It was suggested that the Commission consider how best to understand the influence of policy on the spatial distribution of demand (both across and between cities). Were there places which could demonstrate how policy had more actively shaped demand in desirable ways?

As suggested by the evidence received by Transport for Greater Manchester and Bristol City Council, there is significant variation in how travel patterns are changing within as well as between cities. Trends in central areas to move away from the car appear in many major cities. Other trends, such as a reduction of personal travel for retail seem to occur over a much broader spatial scale. This makes understanding how mobility is supporting participation in the economy more challenging and seemingly less homogenous.

**Changing Retail Sector and Impacts on Demand**

The past decade has seen a major shift in the retail sector with a significant and on-going increase in online shopping. Online shopping is now 10-12% of sales and the primary method of purchase for 48% of 18-24 year-old. It has become normalised to the extent that 48% of houses and 31% of flats receive 5 deliveries per week. There has been a reduction in shopping trips of 27% reported through the NTS between 1995/98 and 2014 which has an associated reduction in distance travelled of 166 miles (19%) per year.

Some of the personal trips are offset by increased delivery van traffic. Light goods vehicle traffic is the fastest growing element of road traffic growth (DfT statistics identify a 70% growth in road miles over the last 20 years, compared to 12% for cars and 5.5% for heavy goods vehicles). A recent study for the RAC Foundation however, found that parcel delivery vans comprise around 4% of the LGV fleet and 10% of their mileage, suggesting that retail related LGV growth is only a part of the story of rising LGV mileage (Braithwaite, 2017).

The changing nature of retail and shopping is a good example of the changing relationship between economic growth, consumption and travel. However, to understand the changing dynamics of shopping requires a view of how both consumers and suppliers are changing and the relationships between them. Some key elements discussed during the session are described below although this is not exhaustive. We conclude that current approaches to understanding shopping trips are fairly crude.

- There has been a significant shift in physical retail stores, their location and functions which sits alongside the online changes. The rise in convenience supermarkets, increased competition from discount retailers (and growth in numbers of outlets) and the development of click-and-collect services both within retailer and at third party sites (such as Collect Plus and Doodle) mean that it is easier for people to build parts of what were previously discrete trips into everyday journeys.
- Whilst online shopping potentially offers the opportunity for parcel consolidation there are trends which reduce the opportunities for this. There is, for example, a growing normalisation of next day delivery (50% of deliveries) and for some services even shorter delivery turnaround times. There is also very strong competition between parcel delivery services which will result in some ‘duplication’ of mileage and routes.
- There is a 13-14% failure rate in deliveries. In recent years there has been a relaxation of the norms around signing for other people’s parcels, leaving parcels in safe places (from rabbit hutches and sheds to wheelie bins) and greater click-and-collect options. Nonetheless, failed deliveries still occur, requiring repeated trips.
- The increased frequency of purchasing of online is accompanied by an increase in returned goods. Work in the DEMAND centre has observed commonplace deliberate strategies of purchasing multiple clothing items (sizes, colours, styles) with a pre-stated intention to return stock that did not suit.
- Some items have become normalised as online purchases (e.g. spare parts) whilst others still have a strong association with physical visits to stores (e.g. sofas and beds). The picture is more nuanced still though with physical visits to stores often then being associated with online research and potentially an online purchase. The chain of browsing, comparing,

purchasing, delivering and returning has changed significantly and is in on-going flux. It seems clear that what is counted as a shopping trip in the NTS can only be capturing a part of shopping behaviour. This gap is growing over time.

The importance of managing the demand for freight movements was also highlighted in the session. Professor Cherrett noted that there can be very significant delays caused to general traffic where there is not sufficient space for deliveries to park as they may otherwise block traffic. In addition, there are often multiple delivery drops from a vehicle and vehicles can be stopped and left for well over half of the time that deliveries are conducted. In major city centres warehousing space has shrunk in central areas which could contribute to additional vehicle miles.

Opportunities do exist for last mile consolidation (e.g. Gnewt cargo in London) through joint procurement, clustering of deliveries and micro-consolidation of certain uses, and pedestrian and bike last-mile solutions. However, this requires a different emphasis on how retailing will evolve and be managed. Public sector consolidation schemes (e.g. Bristol Broadmead Centre) for retail have typically required subsidy and participation would need to be part of the conditions of property rental to be really effective. Other public sector joint procurement is being trialled in London. The current emphasis on growing customer volume and the normalisation of free and next day delivery type offers poses challenges to a more planned approach.

**Changing Employment and Impacts on Demand**

Evidence to the Commission from the Department for Transport identified underlying changes in patterns of travel to work which challenged the NTS definition of a commute as a home-work journey. The session reviewed some of the recent trends in changing employment type and patterns of work and the work of the Commission on Future Work and Skills which had developed some employment futures scenarios for 2030.

As with retail, the consideration of employment change could potentially be important to understanding future travel demand. Whilst existing transport models look at the number of jobs and their spatial distribution, there is limited consideration of the broader social and technical trends which are influencing how, where and how much different parts of society will work. The work of the Commission on Future Work and Skills suggested considerable uncertainty as to how the world of work might change over a 15 year period. These included:

- Changing work-life balance;
- Digitalisation of production;
- Changing work environments; and
- Artificial Intelligence and Robotics

These uncertainties do not feature in thinking about transport futures.

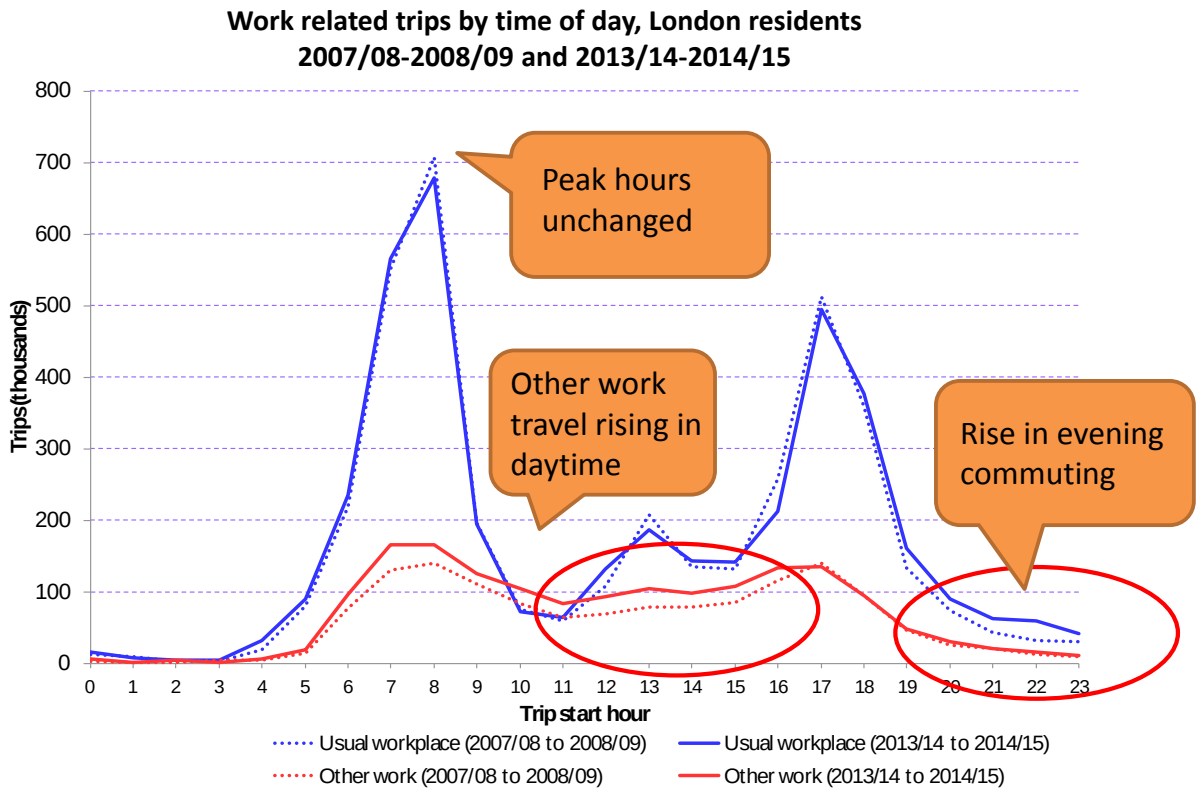
The transition to an economy where 80% of employment is based around the service sector was rapid from the 1960s. Much has been made of the potential for the commute trip to be replaced by home or other remote working. The evidence however suggests that this has been a slow process and that the enduring need for face to face interaction, desire for some separation between home and work and other workplace cultural norms mean home working has not colonised work in the

same way that online shopping has colonised retail. There has been a growth of 1.3million people working at home between 1998 and 2014 and a 2% increase (to 23%) in people working in more than one place per year over the 13 years to 2015.

There is an acknowledgment that work is moving increasingly to a multiple employer 'portfolio' career structure, whilst large organisations also increasingly use a diverse 'portfolio' of workspaces. Companies are seeking more flexible terms on office rentals with the ability to downsize or move to accommodate their needs. In addition, providing high quality accommodation with the potential for interaction and better facilities (e.g. coffee shops, gyms) is seen as important for some larger employers.

There has been a rise in 'third-place' working such as coffee shops as people move around for work, facilitated by wifi coverage. This may also sometimes be response to tightening meeting space provision. Intensification of office utilisation is a notable trend within firms to counteract fewer people working five days a week in one place and to save costs. Noel Cass presented data from a survey showing that 44% of people spent less than half a day at a desk in a day. Many companies are therefore seeking to increase the utilisation of the desks that are available, sometimes mandating working away from the office. This could place significant extra burdens on peak time travel into busy areas which were planned for periods with lower intensity use.

The Commission had sought evidence on changes in the profile of travel demand over time. One of very few examples was provided by TfL in evidence session two which showed that the profile of the peak period into London had not changed recently. Morning peak spreading was not seen but greater travel for work purposes was identifiable between the peaks as well as some increase in later evening travel. What sits underneath the differences between morning and evening behaviour differences is not clear and neither is the relationship between increased home or flexible working and a static aggregate morning peak profile.




Overall, there was an acceptance that changes to the employment market could have significant impacts on travel patterns. There was however little confidence that there is a good understanding as to how this will affect different types of jobs and different areas in the country. The still limited understanding of the importance of changing ICT on the nature of work and therefore where and how often travel would occur was noted as important.

**Overarching Reflections**

The evidence session highlighted the relatively shallow treatment of the changing nature of the activities which form a critical part of the demand for travel. Greater emphasis continues to be placed on the transport explanations for changing work and retail travel patterns than on non-transport factors or factors which might explain why mobility is becoming more or less entwined in the different activities people take part in. This narrows the range of uncertainties and considerations that could inform future demand projections. Whilst physical land uses change relatively slowly it was noted that changes of use and patterns of utilisation can happen much more rapidly.

The discussions around the future of online shopping, and to a lesser extent employment, showed how current categorisations of travel into household-based single purpose trips meant that much of the detail of how activities were changing was marginalised. Shopping clearly occurs over time and space now with less (but not zero) physical store based interaction. The mobility associated with the final mile(s) in shopping is increasingly done by third parties. Similarly, home-work commute definitions miss the greater use of trip chains, the capacity of people to work from multiple sites (including third sites) and away from a main place of work for some roles. This raises questions as to the robustness of existing methods for classifying travel demand, particularly looking ahead.

There is also substantial spatial variation in the recent changes in travel patterns that have been observed. Major cities have very different patterns to smaller rural towns and seaside towns for example. Even within bigger cities the dynamics of change appear most strongly in central areas. Different demographics, employment structures and patterns of work in different places may be a factor in this although there are some trends, such as the growth in online shopping, which appear across all places. It was suggested that the Commission look at a variety of places where pro-active planning had been able to steer demand in ways which reduced distances travelled whilst enhancing quality of life.

In considering the potential changes to mobility options in Evidence Session 4, it was suggested the Commission understand where different ownership and usership patterns might emerge first or most strongly given the apparent divergence in travel trends across spatial areas.

## Acknowledgments

The report was assembled by Greg Marsden based on the rapporteur notes provided by Ersilia Verlinghieri. The workshop participants are gratefully acknowledged for their contributions. The report is agreed as a summary of the meeting by the Commissioners and we are responsible for any omissions or factual errors.

In attendance at Evidence Session Three:

Anesu Bwawa – National Infrastructure Commission
Anne Bastian - Royal Institute of Technology, Stockholm
Daniel Fisher – Transport for Greater Manchester
Elaine Seagriff – Independent (Commissioner)
Ersilia Verlinghieri – University of Leeds
Ewa Kmietowicz – Committee on Climate Change
Greg Marsden - University of Leeds
Hilary Holden- Cambridgeshire City Deal (Commissioner)
Ian Jones – University of Leeds
John Dales - Urban Movement (Commissioner)
Julian Laidler – Transport for Greater Manchester
Nicola Spurling - Lancaster University (Commissioner)
Noel Cass – Lancaster University
Peter Headicar - Oxford Brookes University
Peter Jones – UCL (Commissioner)
Tom Cherrett - University of Southampton and Freight2050