COMMISSION ON TRAVEL DEMAND

Call for evidence : Understanding changing travel demand

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This submission addresses the first three questions of the Commission's Call for Evidence. It draws principally on research undertaken by myself and Gordon Stokes for the Independent Transport Commission analysing trends over the period 1995-2014 using National Travel Survey data. All references are to the resulting Technical Report unless otherwise stated[1]. This material is supplemented by additional work I have undertaken on the spatial dimension of travel behaviour.

Our research included an analysis of the extent to which changes in travel over the period were a product of changes in the composition of the population (eg by age, occupation or residential location) as opposed to changes in the behaviour of members of the individual categories. The results are reported in ch 6. The conclusion is that the bulk of the observed changes in travel in fact represent 'genuine' changes in travel behaviour.

It was not part of our brief to investigate the *cause* of these changes but in ch 7 we briefly review the likely possibilities. A feature of the 'peak-car' phenomenon in particular is the variety of contributory factors, not all of which are exerting an influence in the same direction.

1. Which aspects of travel demand have changed in ways which have not been anticipated by traditional forecasting approaches in the past twenty years?

The presumption of stability in the determinants of travel is central to traditional forecasting approaches but this has been undermined by a number of unforeseen changes which began in the mid 1990s. Prior to this domestic travel in general and personal travel by car or van in particular had been growing broadly in proportion to the national economy. Thereafter there was – and remains - a decoupling of travel distance from both GDP and average household disposable incomes (Figure 7.1).

A second unforeseen change was a rapid rise in population[2]. This was due principally to growth in net international immigration (itself linked with EU enlargement). During the decade from 1995 England's population increased from 136,000 to 411,000 a year and continued at a similar rate thereafter. In aggregate this had the effect of offsetting the decoupling of travel from economic growth noted above but meant that after 1998 travel per head had in fact reached a plateau (Figure 1.1)

The economic recession of 2008-9 caused a dip in total miles travelled but, unlike the recessions of previous decades, there was not a full recovery in subsequent years. In fact,

with continuing growth in population travel per head entered a period of slow decline. By 2014 it had reached a low point of 94% of its 1995 level.

A third unforeseen change from the mid 1990s was that continuing increases in overall rates of licence holding and car ownership did not translate into increases in car use (Figures 3.1 and 2.5). In fact, compounding the overall decline in travel per head, car driver mode share actually *fell* by three percentage points during the period.

This seemingly paradoxical outcome was due primarily to the fact that the growth in licence holding and car ownership occurred disproportionately amongst older women and lower income households – groups with per capita car use well below the average. (Figures 4.6, 4.2, 5.2 and 5.8)

Conversely there was a sharp decline in company car ownership amongst the highest income households groups and a halving in the associated per capita mileage (Figures 5.2 and 5.9). Most remarkable of all was a pronounced fall in licence holding and car ownership amongst young men aged 17-34, again with a near halving of their per capita mileage over the period (Figure 4.2).

A final unforeseen change which can be noted here is the reversal of a long term decline in rail travel and its subsequent doubling over the period from 1995 to 2014. A particular feature of this growth is that it exceeded the growth in disposable incomes and (during the most recent decade) in rail fares (Figure 7.5). This is in marked contrast to the trend in car driver travel which followed a trajectory well below the levels of incomes and car running costs (Figure 7.4).

The 'switch' to rail travel is one of the factors contributing to the overall decline in car driver mode share. However the scale of this needs putting into perspective. Even amongst members of the highest income households their increase in rail travel only represents a fifth of their reduction in car driver travel.

2. *How do these changes relate to the way in which the activities that we participate in have changed? What other factors might explain change?*

Analysis by trip purpose (Table 2.1) shows that within the overall decline of 7% in per capita travel (1996/98 to 2012/14) individual categories vary between +24% (escort education) and -40% (sports participation). Hence it is not necessarily the activities (purposes) for which travel is undertaken that may have changed but rather the *mix* of activities that people choose to engage in, and how. Significantly the four main trip purposes - commuting, visiting friends at home, shopping and business - have all experienced substantial reduction and together account for almost all the overall decline.

In NTS reports measures of travel are customarily presented on a per capita basis. However this does not enable the source of change to be identified. Hence in our research travel by purpose was examined as the product of three factors:

- Change in the proportion of the population making trips of the particular kind (so-called 'trip-makers', calculated on the basis of NTS respondents recording one or more such trips during their travel diary week)
- Change in the frequency with which trip-makers make these trips
- Change in their average trip distance

The results of this form of analysis are shown in Table 2.2

Thus in the case of commuting there has been a reduction of 10% in the proportion of the population making such trips and a 9% reduction in trip-makers' trip frequency. These are offset by an increase of 8% in their average trip distance resulting in an overall reduction of 12%. This is consistent with other NTS data indicating an increase in the proportion of people working permanently at or from home and an increase in the proportion and frequency with which those commuting to a regular workplace occasionally work at home[3]. This trend illustrates an impact of ICT on travel (one of the possible causes of change noted in ch 7). Whilst not strictly 'causing' home-working it has plainly facilitated it.

More generally Table 2 shows differences in the direction of change (+ and -) between individual purposes in the proportion of people making trips and in their frequency. However in relation to trip length there is a near universal trend towards increased distance. Historically this might have been attributed to increased car availability and to counter-urbanisation. In the contemporary context however it seems likely to reflect greater discrimination in the decision to travel. In the case of shopping for example more people will purchase rudimentary items on-line and have them delivered (again NTS evidence supports this). Shopping or 'browsing' trips may be reserved for more discretionary items (possibly combined with social or recreational purposes) at places a greater distance from their home.

Changes in trip-making are also analysed for individual age/gender groups (ch. 4). These reveal differences which highlight the complex mix of factors contributing to overall travel outcomes. For example in relation to commuting participation by men aged 35-59 has fallen by 13% and average trip distance has increased by 9% (Table 4.7). For women of the same age however participation is unchanged and average distance has increased by 30% (Table 4.9). These differences are largely explained by changes in occupation and car availability amongst the female group (Figures 6.8 and 4.21) although their average trip length remains only two-thirds of men's.

3. *How do these (changes in travel demand) vary spatially? Are there distinctions between central, suburban and rural areas and are there differences between cities?*

It is extremely difficult to classify places in a way which captures all the main features likely to be linked with travel behaviour and on which national data is available. Three different metrics have been used :

- Settlement size (the population of built-up areas as defined in Census output)
- Population density (here referring to NTS respondents' post-code sector)
- ONS classification of lower tier local authorities (based on cluster analysis of socio-economic variables)[4]

Each of these has its limitations and there is considerable overlap between them. None incorporat additional characteristics which have been shown to differentiate behaviour between otherwise similar places, for example distance from principal external urban centre and proximity to strategic transport routes[5]. Nor do they embrace differences of urban form and transport operation resulting from local policy which have had the effect of encouraging or discouraging car use. These and other factors mean that in practice there will be considerable variation between places within a single spatial category, however defined.

Using categorisations by population density and settlement size Charts 1 and 2 below show the variation in miles per adult per year for all modes and for car/van driver travel for

Chart 1

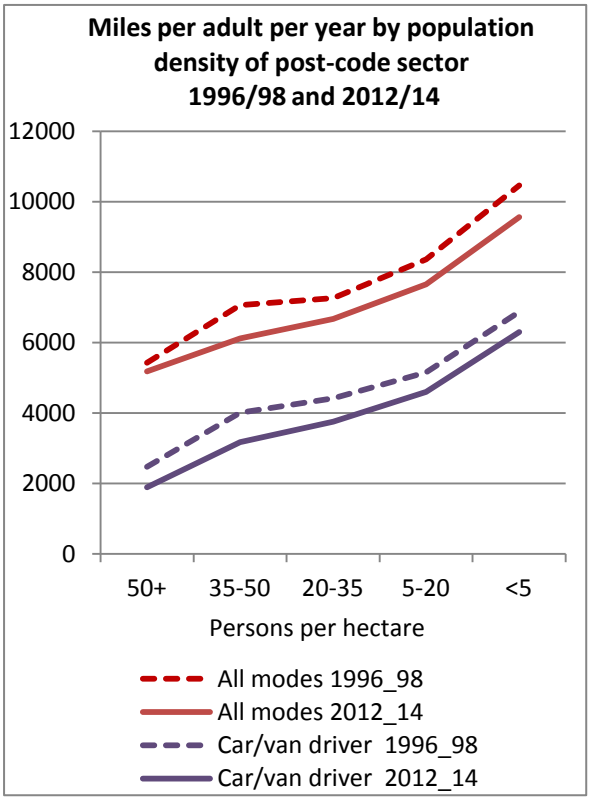
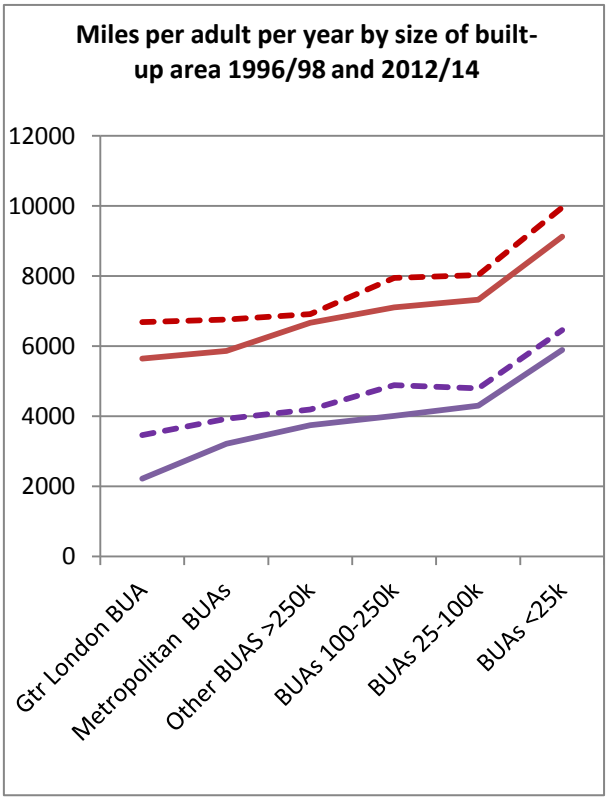


Chart 2



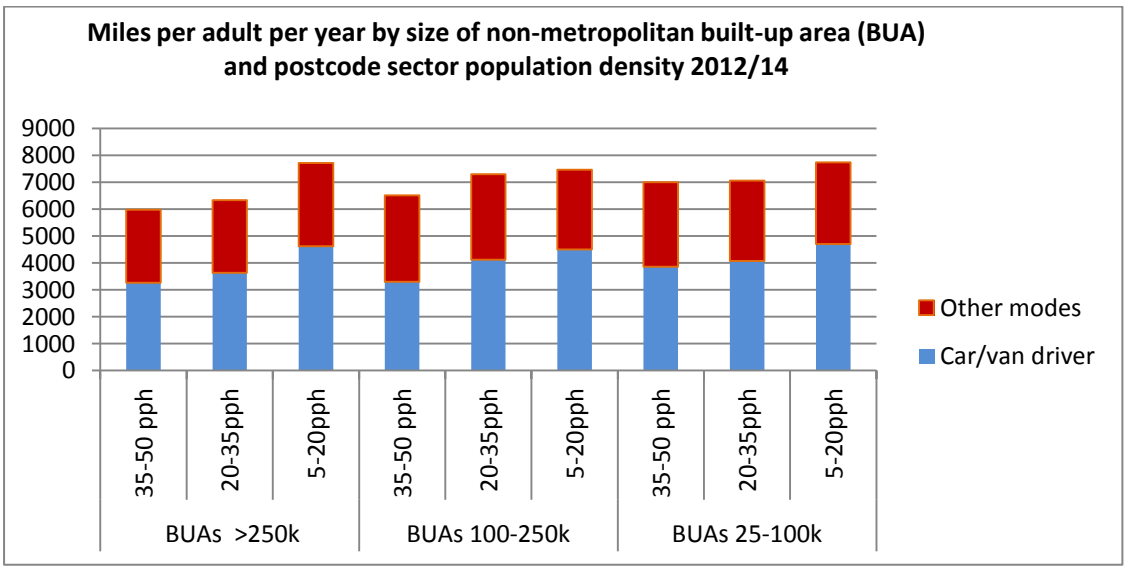
1996/98 and 2012/14. The overall picture is unsurprising. Higher local densities and larger urban areas are associated with less travel and less car use. (Higher densities typically imply proximity to urban centres, shorter distances to local facilities, better opportunities for walking and public transport and more restrictions on parking and car use. Larger urban areas (as well as having higher densities) imply greater self-containment for work and other more specialised trip purposes.

All categories display a similar reduction in travel and car driver mileage over the period. However this apparent symmetry may be misleading in that proportionally the reduction is much greater at the more urbanised end of the spectrum. For example car driver mileage has reduced by 24% in the highest density areas and by 36% across the Greater London BUA but by only 8% and 9% in the least dense areas and smallest settlements. This highlights an important challenge in terms of reducing car use and its adverse impacts nationally – it may be easier to achieve in the more urbanised areas but the biggest volumes are to be found elsewhere.

The Commission's call asks for evidence about differences between parts of urban areas. Chart 3 below compares per capita travel between the three main density bands found in non-metropolitan urban areas greater than 25,000 population (Figure 5.19). These may be equated with their inner, middle and outer suburban areas.

As can be seen there are differences as one would expect but they are modest. The difference between density bands is less in the smaller towns, probably because they occupy a smaller area and hence differences in location (eg distance from the town centre) are less. This highlights another important feature of the national situation. Across much of 'middle' England (the categories shown in the chart comprise 31% of the population) the spatial differences in travel behaviour are relatively small, local factors aside.

Chart 3



The Commission also asks for evidence about differences between cities. This begs the question of how 'cities' are to be defined! Local government administrative units are one possibility but their boundaries are not consistent with respect to built-up areas. (For example Leeds includes substantial small town and rural components whilst Bristol is confined to the core city). On the other hand what are defined as 'built-up areas' do not necessarily distinguish between functional entities. Leeds and Bradford for example are likely to be regarded as separate cities but both are officially defined as part of a larger 'West Yorkshire Built-Up Area'. A bespoke research exercise would be needed to overcome these difficulties.

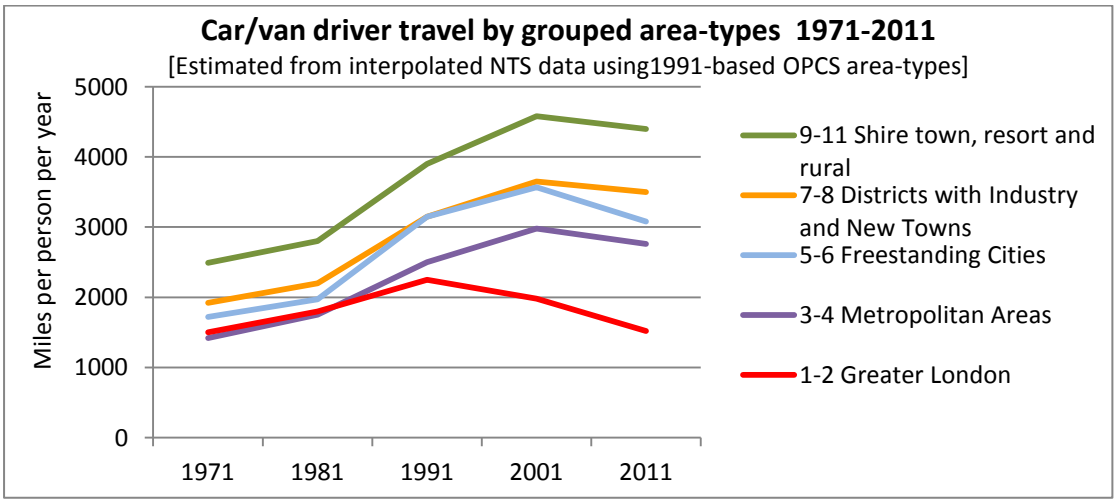
Notwithstanding inconsistencies between local authority units Table 1 below shows the range of towns and cities outside London with administrative populations greater than 100,000 classified by ONS area type. (By definition this means that they have socio-economic similarities). The percentage of commuters travelling as car drivers in 2011 is used as the metric to identify the lowest, median and highest authority in each group.

Table 1 Car/van driver commuter mode share and population (2011) by ONS 2001 local authority area-type, excluding London

Area type (number of LAs)	Lowest	Median	Highest
Regional Centres (15)	Brighton & Hove 39.9% (273k)	Portsmouth 53.5% (205k)	Lancaster 62.2% (138k)
Centres with Industry (17)	Manchester 46.3% (503k)	Bradford 62.2% (522k)	Kirklees (Huddersfield) 68.0% (422k)
New & Growing Towns (8)	Ipswich 57.7% (133k)	Medway (Chatham) 65.7% (264k)	Milton Keynes 68.8% (249k)
Industrial Hinterlands (15)	Hull 53.9% (256k)	Sunderland 62.0% (275k)	St Helens 70.9% (175k)

The classification of local authorities has also been used to identify the spatial variation in per capita driver mileage more generally over successive decades since 1971[6] – see Chart 4 below. This illustrates both the widening range during the period of national growth (to 2001) and – as remarked on above – the different rates of decline since.

Chart 4



The changes between 2001 and 2011 have been examined more closely using Census data and the ONS 2001-based classification of area-types[7]. This leads to the conclusion that distinctive types of change are occurring in contrasting types of places. Chart 5 below illustrates this with reference to change in commuting mode share. (Note that in the chart the area-types are ordered left to right by reducing population density). At either ends of the urban/rural spectrum the divergence already evident in car ownership and use is becoming even more pronounced but the situation amongst intermediate categories is more complex, thus:

London area : Very large reduction in car driver share (from an already low base); replaced mainly by public transport and by cycling in inner areas

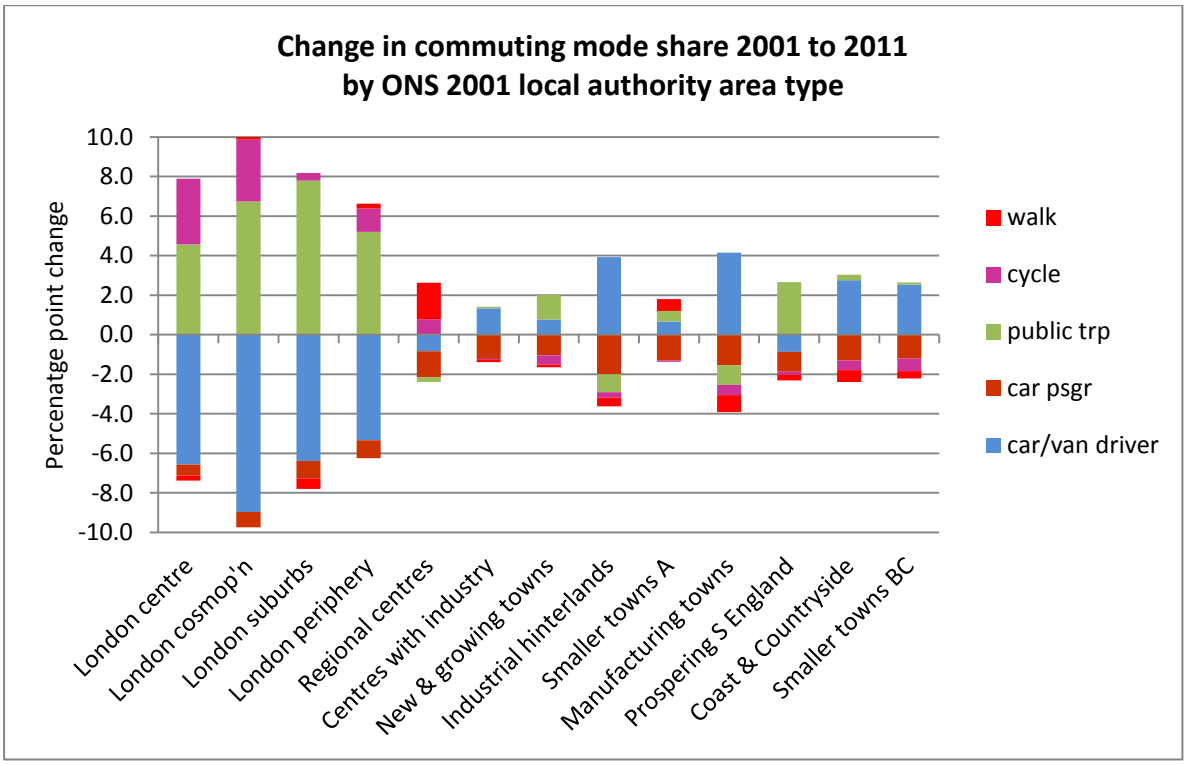
Provincial centres and main shire towns (Smaller towns A) : Little change in car share; small reduction in car passenger; small increases in non-car modes

Industrial Hinterlands and Manufacturing Towns (confined to the Midlands and Northern England, traditionally areas of lower car ownership) : substantial increase in car mode share at the expense of all other modes

Greater South-East beyond London area (New & Growing Towns and Prospering Southern England); mostly high income/ high car owning area but public transport gaining additional mode share at the expense of car use

Smaller shire towns, coastal and rural; already high levels of car driving continuing to increase, replacing car passenger

Chart 5



The higher levels of population increase over the last two decades coupled with divergent travel trends in different types of area prompts the question of whether the changing spatial distribution of the population is having a material effect on aggregate travel volumes. In our report for the ITC we noted that the erstwhile net movement of population from cities to smaller towns and rural areas (so-called counter-urbanisation) had actually gone into reverse – an aspect of the 'urban renaissance'. Over the decade from 2001 to 2011 London, the provincial conurbations and other built-up areas with more than 250,000 population collectively increased their share of the national total by four points to 50% (Figure 6.10). During this time per capita travel nationally fell by 755 miles a year and car driver travel by 550 miles. These reductions were 80 and 65 miles a year greater than would have occurred if the spatial distribution of the population had remained unchanged as at 2001.

Notes and References

1. Headicar P. and Stokes G. (2016) *On the Move 2 : Travel Trends in England 1995-2014* Technical Report Independent Transport Commission London Available at www.theitc.org.uk
2. Strictly a numerical adjustment to an input variable doesn't of itself undermine the notion of stability in relationships. However in this case the scale and nature of the change (which altered both the social composition and spatial distribution of the population) undermined the basic assumption of a 'business as usual' trajectory
3. Headicar P. *Changes in work-related travel : England 2002-2012* Unpublished paper June 2015
4. Details of this classification based on 2001 Census data , including a map of local authorities at group level referred to in this submission is available at http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/ns-area-classifications/index/index.html
5. Headicar P and Curtis C (1998) The location of new residential development – its influence on car-based travel, in Banister D (ed) *Transport Policy and the Environment* London, E&FN Spon
6. Headicar P (2013) The changing spatial distribution of the population in England : Its nature and significance for 'peak car' *Transport Reviews* **33**(3) 310-3
7. Headicar P. *Contrasting Places : Diverging Travel Behaviour? – A Spatial Analysis of Population and Travel Trends in England* World Conference on Transport and Land Use Research (WSTLUR) June 2014 University of Delft The Netherlands