GOVERNMENT SOCIAL RESEARCH
Analysis for Policy

Department for Transport

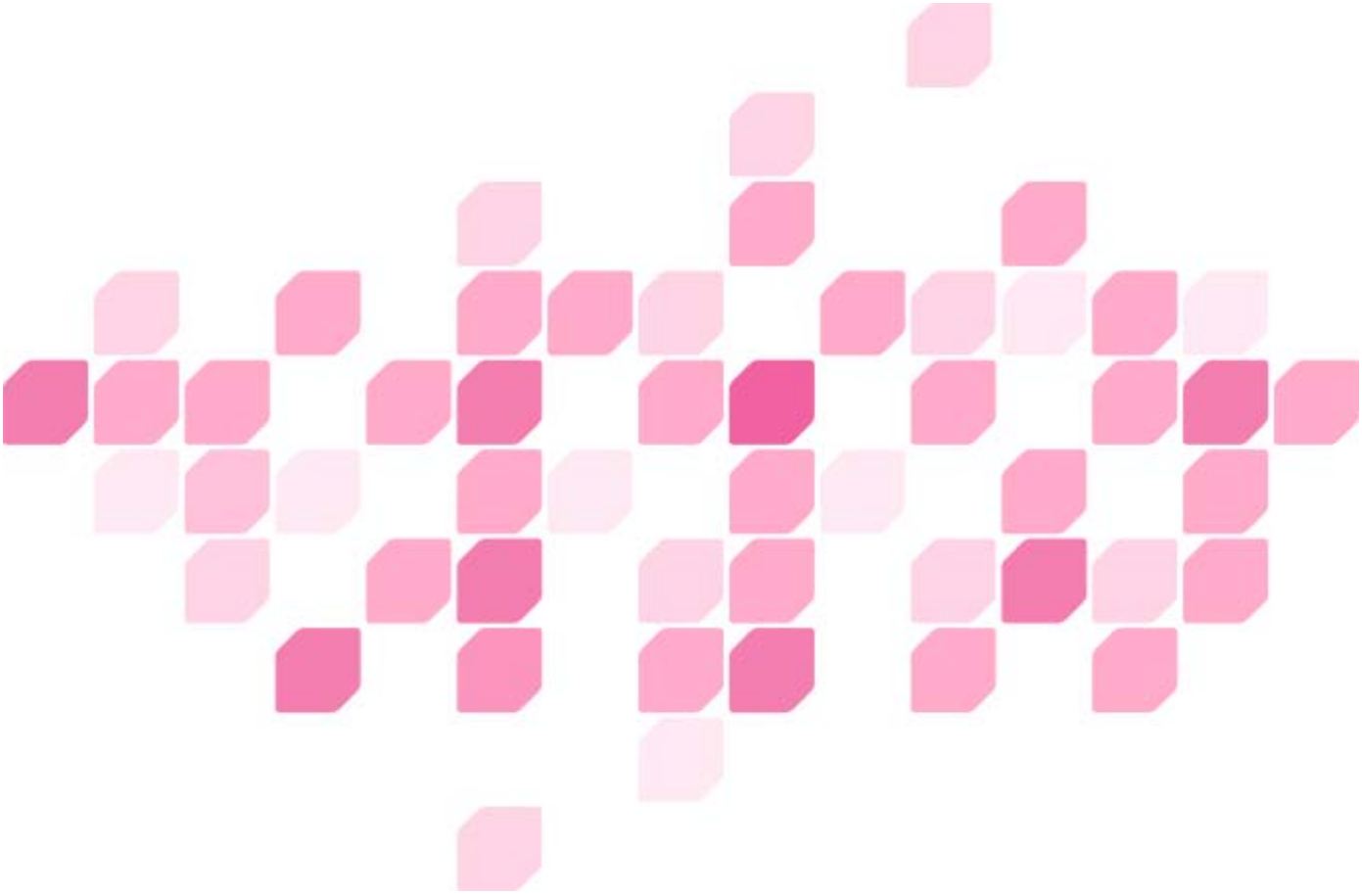
Climate Change and Transport Choices

Segmentation Model - A framework for reducing CO2 emissions from personal travel – SUMMARY REPORT

Alex Thornton, Lucy Evans, Karen Bunt, Aline Simon, Suzanne King and Tara Webster for the Department for Transport

July 2011

Contract number: PPRO 04/06/21



tns bmrb

People Science & Policy

Content

Disclaimer

Although this report was commissioned by the Department for Transport (DfT), the findings and recommendations are those of the authors and do not necessarily represent the views of the DfT. While the DfT has made every effort to ensure the information in this document is accurate, DfT does not guarantee the accuracy, completeness or usefulness of that information; and it cannot accept liability for any loss or damages of any kind resulting from reliance on the information or guidance this document contains.

Acknowledgements

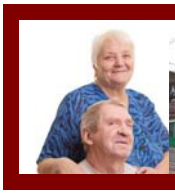
Special thanks go to the Social Research and Evaluation team at the Department for Transport, in particular Ben Savage, Lee Smith, Helen Bullock, Gillian Smith and Deirdre O'Reilly.

Segment Snapshots

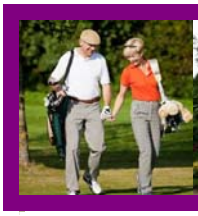
Car owning segments (at least one vehicle in household)


1 *Older, less mobile car owners* (9% of population)
- Older, all have mobility difficulties
- Transport behaviour shaped by lack of mobility
- Travel less than all other car owning segments
- Heavily reliant on the car to get around


2 *Less affluent urban young families* (21% of population)
- Lower travel needs, desire to own larger/faster car but behaviour constrained by relatively low income
- Relatively less reliant on the car than other car owning groups
- Less well educated, more ambivalent about climate change




3 *Less affluent older sceptics* (12% of population)
- Older, very few have mobility difficulties; less affluent.
- Lower travel needs, related to lower incomes and life-stage
- Low level of education, more sceptical about climate change




4 *Affluent empty nesters* (9% of population)
- Older, largely retired, affluent, well educated
- Average levels of car travel; drive less than younger affluent segments
- Mostly likely segment to buy cars brand new
- Pro-environmental but more sceptical about climate change specifically


5 *Educated suburban families* (17% of population)
- Working age, higher income, well educated, many have children
- Travel and drive a lot; most likely segment to travel by plane
- Positive about cycling, but distances and safety are barriers
- Concerned about climate change but have high travel needs


6 *Town and rural heavy car use* (13% of population)
- Working age, higher income but less well educated
- Most 'rural' segment, but also living in urban areas
- Highest levels of car ownership and car travel; own largest cars
- Speed/performance and style/design important in car buying

Non-car owning segments (no vehicle in household)


7 *Elderly without cars* (6% of population)
- Oldest segment, high level of mobility difficulties
- Very low travel needs, do not travel long distances
- Reliant on lifts from others and public transport to get around


8 *Young urbanites without cars* (7% of population)
- Younger, well educated, big city-dwellers (many in London)
- Heavily reliant on walking and public transport to get around
- Transport behaviour results from location and life-stage, may change

9 *Urban low income without cars* (5% of population)
- Younger, low income, low education, high levels of unemployment
- Low travel needs, reliant on walking and public transport
- Aspire to car ownership but cannot afford a car

Executive summary

This summary report outlines a segmentation of public attitudes to climate change and transport choices, as commissioned by the Department for Transport. It includes the one-page 'segment snapshots' and the executive summary taken from the full report. The segmentation model provides a framework for local authorities and the voluntary, communities and social enterprises sector seeking to develop effective, targeted sustainable transport initiatives which take account of the nature of their local population. The segmentation focuses primarily on surface transport with some findings related to air travel behaviour.

The segmentation was developed using statistical analysis of data from a nationally-representative survey of adults living in England. The analysis identified nine distinct segments. These were subsequently refined using a series of qualitative focus groups with seven of the nine segments. The main aims of the segmentation were to:

- identify and quantify groups or segments within the population that differ in terms of the factors relevant to reducing CO2 emissions from personal transport use;
- enable a better understanding of the segments that exist within the adult population of England;
- provide a model which could be used by the Department and its partner organisations (including local authorities) to develop more targeted and effective sustainable transport initiatives.

This segmentation report follows an interim report and accompanying dataset of the survey findings published in December 2010[1]. The segmentation model described in this report is based on data from 3,923 face-to-face, in-home interviews conducted between November 2009 and June 2010 with adults (aged 16 plus) living in England. The main survey found a great deal of variation in travel behaviour and attitudes towards the environment among different groups of people and across different types of locations. In particular:

[1] Thornton, A. Bunt, K. Dalziel, D. Simon, A. *Climate Change and Transport Choices*, available here: http://www.dft.gov.uk/pgr/scienceresearch/social/climatechangetransportchoices/

- Higher income groups showed less sustainable transport behaviour, tending to own more cars; own cars with larger engines; travel by car more often; travel more miles a year by car; and fly by plane more often; than lower income groups
- Better educated respondents tended to hold more 'pro-environmental' attitudes.
- As there are strong links between education and income, this led to an apparent disconnection between attitudes and behaviour; higher income, highly educated respondents tended to be more pro-environmental in their attitudes but less sustainable in terms of their actual transport behaviour than lower income, less well educated respondents.
- Those living in rural areas tended to show particularly high levels of car travel, more positive attitudes about cars and less positive attitudes about alternative modes.
- Older age groups cycled less and tended to hold greater concerns about cycling.

The quantitative segmentation model was produced using a combination of factor (or principle components analysis) and cluster analysis. This report describes nine distinct clusters, or segments, within the adult population. Respondents who lived in a household with at least one vehicle were segmented separately from those who lived in a household with no vehicles. This produced six segments of 'car owners' and three segments of 'non-owners'. An overview of the nine segments is provided in Table A.

Table A. Summary of segmentation

Segment	Description of segment	% of population
	Car owners (at least one vehicle in the household)	
1	Older, less mobile car owners	9%
2	Less affluent urban young families	21%
3	Less affluent, older sceptics	12%
4	Affluent empty nesters	9%
5	Educated suburban families	17%
6	Town and rural heavy car use	13%
	Non-owners (no vehicle in the household)	
7	Elderly without cars	6%
8	Young urbanites without cars	7%
9	Urban low income without cars	5%

Figure 1 presents the segments in relation to each other, comparing their transport behaviour with perceptions of their own environmental attitudes and behaviours.

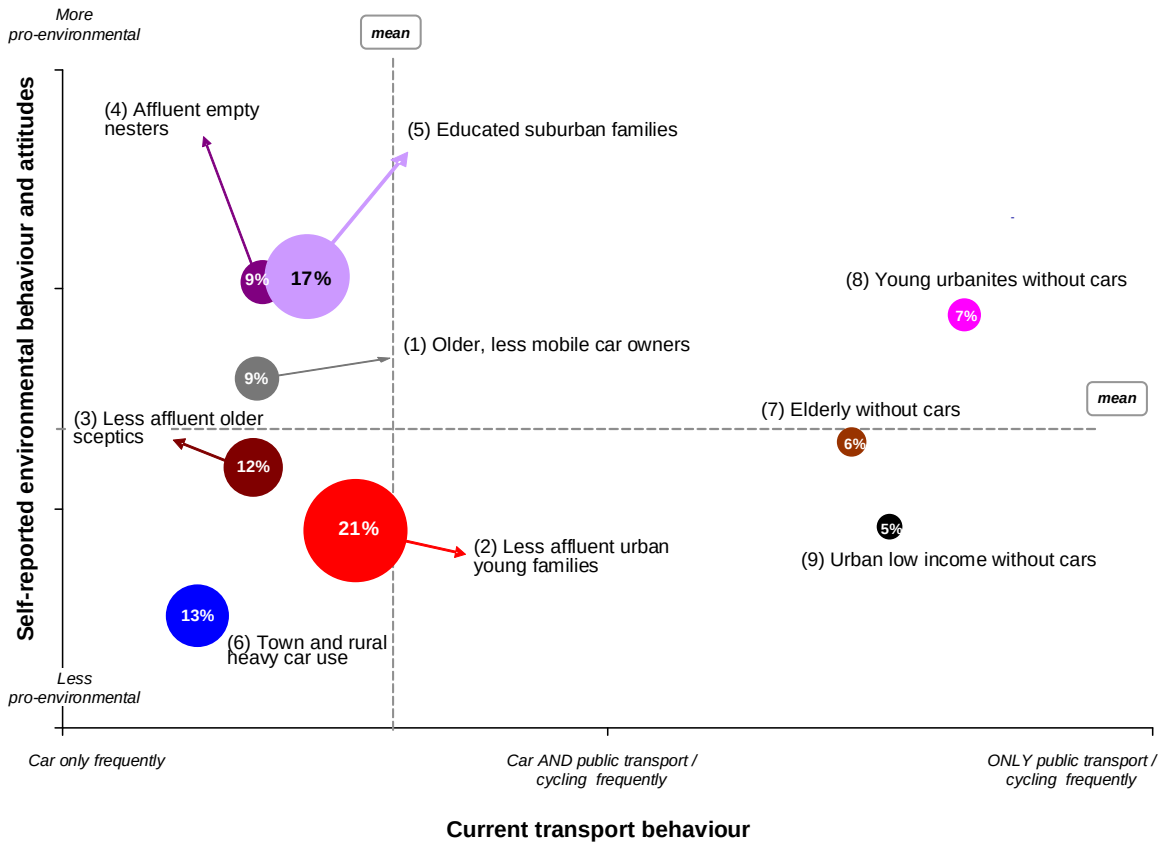
Transport behaviour was defined as how frequently respondents travelled by car and by public transport or bicycle[2]. Environmental attitudes and behaviours were summarised using a combination of self-reported behaviour and willingness and interest to do more to reduce their CO2 emissions[3]

Figure 1 highlights the substantial and predictable differences in travel behaviour between car owners (segments 1-6) and non-owners (segments 7-9): car owners' transport behaviour consisting mainly of car travel; non-owners' transport behaviour consisting mainly of travel by other modes. It also shows more subtle variations in environmental attitudes and behaviours within the car-owning and non-car owning segments which related to differences in levels of education (*affluent empty nesters* (4), *educated suburban families* (5) and *young urbanites without cars* (8) having the highest educational qualifications). As might be predicted based on the previously published survey findings, Figure 1 also indicates that those segments with the most rural profiles (*town and rural heavy car use* (6) and *affluent empty nesters* (4)) were amongst those exhibiting the greatest tendency to travel by car rather than by other modes.

[2] To be regarded as travelling 'frequently' respondents had to be using a mode of transport at least once a week. Respondents are divided into three sub groups, those who travelled frequently: (i) *only* by car; (ii) by car *and* public transport / bicycle; or (iii) *only* by public transport / bicycle.

[3] Environmental attitudes and behaviours were summarised using a combination of how much the respondent reported doing that was environmentally-friendly, whether or not they wanted to do more than they already did, and how interested they were in finding out more about what they could to do reduce their CO2 emissions. This measure produced nine distinct sub-groups which are described more fully in the interim report of survey findings. All behavioural measures were self-reported and are therefore perceptions of behaviour rather than measures of actual behaviour. The interim report and accompanying dataset can be accessed here: http://www.dft.gov.uk/pgr/scienceresearch/social/climatechangetransportchoices/

Figure 1. Summary of the nine segments in terms of self-reported current transport behaviour and environmental attitudes and behaviours



The nine segments are described briefly below:

Car owners (at least one vehicle in the household)

(1) Older, less mobile car owners (9% of population)

All in this segment had mobility issues that restricted their use of public transport or ability to walk or cycle and many were elderly. They were the least likely of all the car-owning segments to travel by car every day and personally drove a low annual mileage. Around a third were solely car passengers as they did not have a driving licence. They were very attached to their cars as they relied heavily on them to get out of the house and to attend frequent hospital appointments, where punctuality was essential.

They were fairly receptive to using Demand Responsive Transport (e.g. Dial-a-Ride) services and were keen to learn more about the options available - Demand Responsive

Transport was seen as potentially helpful for hospital appointments and visits. Going shopping was seen as a major social activity and their lack of confidence in using the internet prevented some from shopping online. However, others were using the internet to shop online, typically for non-food purchases, so that they did not have to walk round shops.

Overall, mobility issues among this segment restricted their ability to use public transport (with the exception of Demand Responsive Transport) or to walk or cycle. This, coupled with their already-low annual mileage, indicated that they offered the least potential of any car-owning segment to reduce their carbon emissions from car travel.

(2) Less affluent urban young families (21% of population)

Most of this segment were under 40, from lower socio-economic groups and living in urban locations. They were also the least affluent of the six segments of car owners. Many in this segment had children living at home and in around a quarter of cases the respondent interviewed for the survey was a young person (aged 16-20) living at home with their parents. Most of the segment appeared to have started work without going to university. They showed below-average levels of concern about climate change and interest in learning more about what they could do to tackle it.

While everyone in the segment lived in a household with a car, the household tended to own just one vehicle and this segment's travel was more varied (less car travel and more public transport or cycling) than other 'car-owning' segments. Furthermore, only around a half described themselves as the 'main driver' of their household vehicle; many only used the vehicle as a passenger. *Less affluent urban young families* were the most likely of the car-owning segments to own older, second-hand cars with smaller than average engines, with some having traded down to a car with a smaller and/or more fuel efficient engine in the last few years (in response to rising fuel costs and financial pressures). However, along with *town and rural car use* (6) they were among the most likely to say they would like to own a larger or faster car. They were the most likely of all the car-owning segments to see car ownership as a sign of success and their car appeared to be an important purchase for them, reinforcing their sense of identity.

For *less affluent urban young families*, concerns about personal safety related to crime or anti-social behaviour and feelings of vulnerability when using alternative forms of transport appeared to be key barriers to walking, cycling and using buses and trains instead of their car. Nevertheless, their young age profile and relatively short commute (on average, less than seven miles) suggested they may have greater potential to walk or cycle more to work than all the other car-owning segments. Those with younger children appeared to value the option of online shopping as a more convenient and less stressful alternative to shopping trips.

(3) Less affluent, older sceptics (12% of population)

Less affluent older sceptics consisted of middle-aged and older individuals from lower socio-economic groups, mostly living in urban areas outside London. Unlike *older, less mobile car owners* (1), they were very unlikely to have mobility difficulties. Nine in ten held a driving licence and over half (55%) travelled by car every day. Similar to *less affluent urban young families* (2), they were more likely to own older cars with smaller engines than other, more affluent, car-owning segments. However, unlike *less affluent urban young families* (2), they tended not to want to own a larger or faster car.

Less affluent older sceptics used buses and trains occasionally for journeys where parking was difficult and were more likely to use these modes if they yielded cost savings. Those with free bus passes valued them and attributed their use of buses to having this benefit. As they did not have the mobility issues of *older less mobile car owners* (1), they were willing to walk for short journeys and valued the health benefits of walking, but did not see cycling as relevant or practical for people of their age. They were motivated by cost savings and saw trip avoidance and trip-chaining as sensible behaviours to adopt.

They were the least well educated of all the car-owning segments (63% had none of the qualifications listed in the survey) and were fairly sceptical about climate change; they were only prepared to change their travel behaviour if the alternative option was easier or cheaper for them. The focus group discussions suggested they saw the development of electric cars, new energy sources and government action, such as making city centres

car free and car scrappage schemes, as the sort of actions needed. Demand Responsive Transport (e.g. Dial-a-Ride) might be promoted as a more convenient alternative for some types of journey. Better understanding of fuel efficiency might encourage some to buy smaller or more efficient petrol or diesel cars when they change cars as they tended to think of 'fuel efficient cars' as hybrids and electric vehicles which, for now, were seen as too expensive for them to buy.

(4) Affluent empty nesters (9% of population)

This was one of the most affluent segments and the majority were from socio-economic groups ABC1. Nearly all were aged 50 or over and two-thirds were retired at the time of the survey. They tended to be well educated (relative to the other older segments 1, 3 and 7) and were unlikely to have children at home anymore. The segment was evenly split between those living in rural areas and those living in urban locations outside London.

Affluent empty nesters tended to use their cars frequently, travelling by car out of habit[4] but their personal annual mileage was low relative to the other more affluent car-owning segments 5 and 6 (notably the *town and rural car use segment* (6) who were also more likely than other segments to live in rural locations). They were the most likely of the car-owning segments to buy new cars and to own a car under five years old. They tended to buy the same type and/or brand of car each time. They tended not to be interested in speed and performance when buying a car, instead prioritising reliability, safety and comfort, although they were still more likely to own a car with a large engine (1801cc or more) than the three less affluent segments (1 to 3). Retirement was identified as a key trigger point for buying a new car among this segment and some may be receptive to buying a smaller or more fuel efficient car if it met their requirements for reliability, safety and comfort and was not too dissimilar to their usual type and brand of car.
Affluent empty nesters were receptive to messages about trip chaining and about walking more because of the health benefits. A lack of IT skills prevented some within

[4] Car travel was defined as a habit where respondents said that three statements describing the nature of travelling by car applied to them. A habit has been defined in psychological literature as the semi-automatic performance of a well-learned behaviour; one that is subconscious and triggered by environmental stimuli (Anable et al, 2006)

this segment from using journey planning tools and shopping online. While they showed relatively positive attitudes towards the environment, they were more sceptical about the concept of climate change specifically, in this respect being similar to the other older segments (1, 3 and 7).

(5) Educated Suburban Families (17% of population)

This was the best educated and the highest social grade segment; most were financially comfortable. After the *town and rural car use segment* (6) they tended to have the highest household incomes; a quarter with an annual income of £60,000 or more. Mainly aged 30-59, most worked full-time and many still had children living at home.

Educated suburban families drove a lot, being the second most likely segment after *town and rural heavy car use* (6) to drive 9,000 miles or more a year; they also had the second longest average commute (nearly 11 miles). Unlike *town and rural heavy car use* (6), *educated suburban families* were very unlikely to see car ownership as a sign of success or say that they would like to own a larger or faster car; they were also by far the most likely car-owning segment to say they would prefer to drive less than they do. While *educated suburban families* were the most likely segment to say in the survey that environmental concerns/low CO2 emissions were important to them when buying a car, still only 30% of them said so. The focus groups suggested that family commitments often dictated the size of car they chose but that they were prepared to at least consider buying more fuel-efficient cars. Some of the focus group participants were aware of the recently-launched government electric car grant.

They continually reviewed their transport modes for regular journeys as a function of trip chaining and some had recently changed their travel behaviour as a result of family or work changes or the cost of petrol. While two thirds used their cars every day, they were the most likely of all the car-owning segments to cycle regularly, with one in five cycling at least once a week. *Educated suburban families* were prepared to cycle more because of the health benefits, cost savings and, in some cases, time savings; for some cycling to work was quicker than other modes. However, many were deterred from cycling because of the danger from traffic (they were the most likely segment to cite traffic-related safety concerns as a reason for not cycling to work); the lack of secure

storage; and the difficulties of washing and changing at work. Only around 30% of those with a regular commute lived within 'cycling distance' of five miles from their workplace.

Their attitudes were not opposed to bus or train travel but they found these modes of transport inconvenient, slow/infrequent or too far away, although they were less likely to cite proximity (e.g. train stations being too far from home) as a reason for not commuting by bus or train than those in the *town and rural heavy car use* segment (6). Their work and domestic commitments and income levels meant that they were prepared to pay more to save time. Many had second cars that were not heavily used and they may be willing to join a car club instead of running a second car. They were the most likely of all the segments to work from home and use home delivery already and appeared to have the greatest capacity to do these actions more. They already trip chained to save time. They were the most likely of any segment to have taken a flight in the last 12 months and were the most likely segment to have taken one or more domestic flights within the UK.

Of all the segments, *educated suburban families* were the most concerned about climate change and were aware that their transport behaviour had an impact on the climate, even though they may not have fully understood the scientific details. However, the focus groups suggested that some saw environmental benefits as more 'nice to have' outcomes of actions that would primarily save them money or time. Nevertheless, overall this behavioural and attitudinal profile suggested they may be more likely to change their transport behaviour, with suitable incentives, than other segments.

(6) Town and rural heavy car use (13% of population)

The *town and rural heavy car use* segment tended to be middle aged, middle class families living in urban areas outside London or in rural areas. In most cases both partners were working. They were the most likely to live in a rural area and were less likely than most other segments to live close to public transport links. Although they had relatively high household incomes similar to *educated suburban families* (5), they were less well educated. They were ambivalent towards the environment and climate change and sceptical about the impact they could make by changing their behaviour. They were

the least likely to report that they were currently doing things to reduce their CO2 emissions.

The *town and rural heavy car use* segment were the most frequent car travellers, they drove the greatest annual mileage, they owned the highest number of vehicles per household (typically three or more) and the car they used most often had the largest (petrol or diesel) engines, typically 1801cc or greater. Along with *less affluent urban young families* (2) they were among the most likely to see car ownership as a sign of success and to say that they would like to own a larger or faster car (although unlike *less affluent urban young families* (2), they had higher incomes and already owned a car with a relatively large engine). They were by far the most likely car-owning segment to say that speed/performance and style/design were important to them when buying a car. They commuted the longest average distance (nearly 14 miles) to work of any segment and were the most likely to travel to work by car.

Those in rural communities, where public transport infrastructure was more limited, said that having a car at their disposal made them feel less isolated. Buses, trains, cycling and walking were not considered viable options for their most regular journeys due to time, convenience, distance, lack of any, or direct, bus/train services, cost and the (poor) weather. Walking and cycling were viewed as leisure activities rather than a mode of transport. They were the second most likely segment (after *educated suburban families* (5)) to have taken a flight in the last 12 months.

The actions they could be most easily encouraged to adopt would be trip avoidance and switching at least one of their cars to smaller or more efficient models, as this would have least impact on their current lifestyle. Time and convenience and, to a lesser extent, cost would be the primary motivators for behaviour change. They might also be encouraged to make more mixed mode journeys and walk and cycle short journeys, where they offer time savings or health benefits. However, these wider forms of behaviour change would be difficult to achieve amongst this segment, due in part to structural and practical barriers but also because they travelled by car as much out of habit and desire as necessity. They would probably be more difficult to encourage to think about other options than *educated suburban families* (5) who have more pro-environmental views.

Non-car owners (no vehicle in the household)

(7) Elderly without cars (6% of population)

This was the oldest segment, with most members being aged 70 years or older. Consequently many had mobility issues related to a disability or longstanding health problem. Many came from lower socio-economic groups and a high proportion were retired (and were almost certainly drawing a state pension). Despite this, most felt they were coping or living comfortably financially. Most of the segment lived in towns and cities outside London.

They were relatively reliant on cars to get around (receiving lifts from friends and relatives) but few members of the segment held a driving licence or were keen to own their own car. Those who were able to tended to travel by bus a lot but, in contrast, long distance travel was uncommon; few travelled by train regularly and almost no one in this segment had flown in the last 12 months. Realistically, given their age and high levels of mobility issues, cycling and walking were not forms of transport this segment were likely to adopt.

The *elderly without cars* felt their lifestyles had a low impact on the environment (most felt they were environmentally-friendly in most or everything they did). They were the least well educated of all nine segments (73% had none of the qualifications that were listed in the survey) and were among the least knowledgeable and least concerned about climate change. They tended not to feel personal responsibility for climate change and most said they were not interested in finding out more about what they could do personally to tackle climate change.

(8) Young urbanites without cars (7% of population)

Two in five of this relatively young, affluent and well-educated segment lived in London, the rest in other urban areas. City centre living meant that day-to-day they did not travel far and many walked to work. They did not see themselves as needing a car, which would be costly to run and park, given the amount they would use it. They appeared to be the only non-car owning segment likely to travel long distances; they were the most

frequent users of trains of all the nine segments and half of them had taken a flight in the last 12 months. Day to day, they were heavily reliant on walking, buses, trams (where available) and, in London, the Underground. Outside London, the available housing stock and the perceived quality of the schools meant that city centre living was not perceived as child-friendly, so they expected to move to the suburbs and may become *educated suburban families* (5) later in life.

The main challenge with this segment appeared to be to ensure that their personal transport CO2 emissions do not increase as they get older. The focus groups suggested this segment tend to expect that electric or hybrid cars will be a viable option by the time they come to buy a car and some expected to buy such cars. Car clubs might mitigate the need for them to own a second (or any) car in future. Good information about public transport access might encourage continued use particularly among those with young children; it might also help those moving out to the suburbs in future to consider proximity to public transport links and local amenities in their choice of future home. Messages and infrastructure that enable and encourage walking or cycling for short trips if they move or have children could also help to enable continued travel by these modes.

(9) Urban low income without cars (5% of population)

Nearly all members of this segment were less affluent than average and most lived in urban locations. They also tended to be much younger than the overall population. They were defined by their relatively low socio-economic profile and high levels of unemployment; they were by far the most likely of the three non-car owning segments to feel that not having a car had seriously damaged their career or job prospects. They were also the least financially comfortable of the nine segments.

Most aspired to own a car and their reasons for not owning one tended to be financial (they would buy a car if they could afford one) and related to the fact that relatively few of them (only 17%) had a full driving licence. Their views on public transport were not generally positive. While many used buses on a regular basis, they tended to do so reluctantly and held relatively negative views about buses and bus travel. Long distance travel was uncommon, with few travelling regularly by train and hardly any having taken a flight in the last 12 months.

They were by far the least well educated of the younger segments (51% had no qualifications) and they were among the least concerned about climate change. They tended to report doing less that was environmentally-friendly than other segments and did not generally want to increase the amount they were doing for the environment. They tended to feel their lifestyles were already low impact and they seemed uninterested in changing their behaviour. Given their aspiration to car ownership, they might become *less affluent urban young families* (2) in future.

Summary of transport behaviours that each segment might adopt

Figure 2 summarises the transport behaviours that people in each segment might be most easily encouraged to adopt. For the car-owning segments, trip avoidance and chaining and buying smaller/more fuel efficient cars were the changes they might be most willing to make as these can be accommodated more easily within their current lifestyle. However, other potential changes reflected the profiles and attitudes of the particular segments. For the non-car owning segments, notably the younger segments (8 and 9), actions could enable and encourage them to maintain their current transport behaviour or help to minimise the extent and impact of car ownership on their future personal transport CO2 emissions.

The conclusion to this report provides a hierarchy of importance which divides the nine segments into four broad groups according to the priority the Department and its delivery partners could attach to these. This order of priority is based on the 'impact' that each segment currently has and the 'potential for change' among the segment. Overall, *educated suburban families* (5) and *affluent empty nesters* (4) should be considered the highest priority. Both segments currently have a reasonably high impact in terms of their CO2 emissions and there is a good level of potential for change in both segments. In contrast *older less mobile car owners* (1), *elderly without cars* (7) and *urban low income without cars* (9) should be regarded as relatively low priority. They have a low impact in terms of their travel behaviour as compared with other segments they travel less frequently and travel infrequently by car.

Figure 2. Summary of the nine segments in terms of more transport behaviours they might adopt