

2. Contextual review: developments in the UK since the 2004 Smarter Choices report

2.1 Introduction

In the period since publication of the original smarter choices report (Cairns et al., 2004) there has been growing interest in the potential for smarter choice measures to achieve behaviour change. This chapter provides an overview of the main developments in the UK in the last five years, in terms of policy, practice and our theoretical understanding. It is worth noting that this is a fast-moving field, and that the information contained here is correct as of October 2009.

A summary of the main research findings from the 2004 report was published by Cairns et al. (2008). The original smarter choices report and an accompanying case study volume are available on the Department for Transport's website, as is a good practice guide based on the findings of the original research, entitled *Making Smarter Choices Work* (DfT, 2004a).

Since the smarter choices report was published, the terms 'smarter choices' and 'smart measures' have been increasingly widely used. However, there is still confusion about exactly what they cover and how they are differentiated from other policies. In addition, a range of other terms are being used for broadly the same thing – for example, Transport for London had a 'travel demand management' team, but has recently re-named this as a 'smarter travel' team; at European level, mobility management is still the common term; the term 'soft measures' remains in common usage; and the broader term 'better use measures' was coined by Eddington (2006) to include various interventions of which 'smart measures' form a part.

In the absence of a better definition, the description below, used in our original report, still seems reasonably valid:

“[the term 'smarter choice' or 'soft' measure was originally used] to distinguish these initiatives from 'hard' measures such as physical improvements to transport infrastructure or operations, traffic engineering, control of road space and changes in price, although some soft factors do include elements of this nature. (For example, workplace travel plans often include parking restrictions.) 'Soft' also refers to the nature of the traveller response, with initiatives often addressing psychological motivations for travel choice as well as economic ones. There is an emphasis on management and marketing activities rather than operations and investment. And there is also often the observation that these measures are largely or entirely omitted from established modelling and appraisal techniques, which deal with measures that are assumed to be more reliably understood.”

It is notable that since the smarter choices report was published, there has been increasing interest in modelling smarter choice measures, as discussed further in section 2.7.

Part of the definitional confusion also relates to what smart measures can be expected to achieve, and, in particular, the conditions necessary to realise the types of reductions

estimated in our original study. The original report focused on the importance of ‘locking in’ the benefits of smarter choice measures, arguing that:

“...success depends on some or all of such supportive policies as reallocation of road capacity and other measures to improve public transport service levels, parking control, traffic calming, pedestrianisation, cycle networks, congestion charging or other traffic restraint, other use of transport prices and fares, speed regulation or stronger legal enforcement levels.”

“[All of the scenarios] assume that sufficient other supporting policies are used to prevent induced traffic from eroding the effects, notably at peak periods and in congested conditions. Without these supportive measures, the effects could be lower, temporary and perhaps invisible.”

Whilst this conclusion has never been controversial, it is notable that, in practice, smart measures are often expected to deliver behavioural change in a context which is not consistent with that described above.

Finally, there is confusion over the timescale over which smarter choice measures might be expected to achieve results. Our original study assumed a 10-year period of build-up and reinforcement. Consequently, the results from any individual initiatives need to be assessed in that context. It is likely that shorter-term initiatives would result in less significant impacts, and that long-term support is needed to maximise the effectiveness of schemes. This applies to the work in the Sustainable Travel Towns, as well as the numerous initiatives taking place elsewhere.

2.2 Broadened scope of ‘smarter choices’

Since the original report was published, a range of additional interventions that might be categorised as smart measures have been developed and are increasingly forming part of the portfolio of techniques that those interested in this type of activity deploy. These include:

- residential travel plans – with new guidance published by the Department for Transport (Addison et al., 2005);
- visitor travel plans – Transport 2000¹ had already published guidance on encouraging sustainable travel for leisure and tourism (Transport 2000 Trust, 2001), and there has been increasing interest in developing such solutions over time;
- station travel plans – which were advocated in the 2007 Rail White Paper. More than 70 stations expressed an interest in developing plans, and 31 stations were chosen to do so, in an initiative led by the Association of Train Operating Companies (Local Transport Today, 2008). Measures will be implemented from August 2009, with evaluation completed by April 2012 (ATOC, 2009). Darlington station is one of those involved;
- bike promotion initiatives, such as *Bike It* (a Sustrans initiative for schools); workplace *Cycle Challenges* (in particular, those being developed by CTC and Getmorepeoplecycling.com); cycle training (in particular, *Bikeability*); school and

¹ Now the Campaign for Better Transport

after-school cycle clubs (e.g. the Bicycle Association's scheme *Go Ride* and the CTC initiative *Bike Club*) and a wide range of marketing and promotional work. A particular focus for the development of these initiatives has been the work led by Cycling England in partnership with the Cycling Towns and Cities (see section 2.3.4);

- bike hire schemes – with major schemes in Paris (20,000 bikes), Barcelona (6,000 bikes) and Lyons (4,000 bikes), and a number of smaller schemes (in France, Germany, Belgium, Sweden and Ireland). There is a planned bike hire scheme for London, which will involve the provision of 6,000 bikes from Summer 2010. Pilot phases of bike hire schemes have also been launched in Blackpool and Bristol, and a scheme is planned in Cardiff;
- legible cities – with work in Bristol and London on providing better signing and guidance for pedestrians.

In categorising the activities of the Sustainable Travel Towns for this project, we have added a new category of measure, namely 'cycling and walking information, marketing, training and events'.

2.3 Focus on smarter choices by other organisations

2.3.1 Transport for London

Transport for London (TfL) has put a major emphasis on smart measures with an ongoing programme that has included large scale activity on workplace travel plans, school travel plans and personal travel planning, promotion of car clubs, and the designation of Sutton (in 2006) and Richmond (in 2008) as equivalents to the Sustainable Travel Towns.

For workplace travel plans, TfL reports that its Smarter Travel Unit is working with over 450 London businesses, covering around half a million employees (10% of London's workforce), via two voluntary programmes for London employers, in addition to securing travel plans through the development control process. The voluntary programmes are Corporate (employers of 250fte and above) and Enterprise (20-250fte). Employers with workplace travel plans have achieved an average reduction in car use of 13%-points.

For school travel plans, TfL report that 90% of London schools now have an approved travel plan, with those that have completed 'after' surveys achieving an average reduction in car trips of 6 %-points in three years, and some schools achieving reductions of 10-15%-points (TfL 2008)².

² Note the use of 'percentage points' rather than 'percentage' in these figures. A reduction from say 60% to 54% will be 6%-points, but a reduction of 10% in actual numbers, if the total stays constant. This is particularly important in London where car use is typically already a lower proportion of trips than in other places, and these %-point reductions represent significantly greater relative reductions in traffic. For example, analysis undertaken for a separate project suggests that, for those employers employing more than 100 staff and with more than one set of survey results, the number of cars arriving per 100 staff has reduced from 49.4 to 35.9 – a percentage reduction of 27% (Cairns, 2008). (For comparison with, say, the 21% reduction in traffic reported from the congestion charging, this figure of 27% is more appropriate than the 13%-point figure – though a larger data sample is needed to be confident about its robustness.)

In Sutton, the Smarter Travel Sutton project was launched in September 2006. By September 2008, some 13,821 employees were covered by a travel plan or were working for an organisation that was actively developing one; 100% of schools were covered by a travel plan; and every household had been offered personal travel planning. There was also a strong focus on advertising, marketing and travel awareness. Some 23,500 people had attended events and 29% were aware of the Sustainable Travel Town branding. Other highlights included a 50% increase in cycling between years 1 and 2, and a 13% increase in bus patronage since the programme launch (TfL and LB Sutton, 2009).

As well as undertaking work on specific initiatives, TfL has commissioned a number of overview studies. In particular, Imperial College completed a review of monitoring and evaluation methods used to assess travel demand management (ICCTS, 2008). TfL has also been developing pilot projects to understand how smarter travel interventions might contribute towards 'least-cost planning' by reducing the financial costs of providing transport services at peak hours.

2.3.2 Welsh Assembly

The Welsh Assembly Government selected Cardiff as its first Sustainable Travel City in 2009, offering funding of £14.5 million matched by £14 million from the city council. The initial focus of work in the city will include a range of infrastructure measures and service improvements such as free bike hire and cycle network enhancements, a free city centre bus, and park-and-ride. These will be accompanied by a sustainable travel grant scheme and other promotional initiatives.

2.3.3 Scottish Executive

The Scottish Executive announced a £15 million *Smarter Choices, Smarter Places* programme in 2008, involving seven towns and cities (Barrhead, Kirkwall, Dumfries, Dundee, Kirkintilloch/Lenzie, Larbert/Stenhousemuir and Glasgow's East End). The projects in these towns involve a mixture of public transport and small infrastructural improvements combined with a diverse range of smart measures including personal travel planning, health promotions, bike hire schemes and a car club. Baseline research in the seven towns included segmentation which identified that between 11% and 25% of residents in the towns were both willing and able to reduce their car use (Halden, 2009).

2.3.4 Cycling England

Cycling England is funding 18 Cycling Towns (the original six Cycling Demonstration Towns which were selected in 2005 and a further 12 towns and cities which were selected in 2008) to develop a comprehensive package of measures in support of cycling. The measures include both cycling infrastructure and smart measures such as workplace cycling promotion; school *Bike It* programmes coupled with cycle parking and *Bikeability* cycle training; and promotion of cycling to stations. One of the original six towns is Darlington. Monitoring data for the original six Cycling Demonstration Towns show an average 27% increase in cycling between 2005 and 2009 (Sloman et al., 2009).

2.3.5 Local authorities

A review by DfT of the take-up of smarter choices amongst local authorities found that 27% of Local Transport Plans (LTPs) made a significant reference to smarter choices as a whole, with a further 50% making 'reasonable' reference (DfT, 2007a). Several LTPs contained specific smarter choices strategies or cited smarter choices as a key objective in their planning for LTP2, the second round of plans. However, many others did not mention smarter choices specifically, although they referred to at least some smart measures. A further group made very little reference to smarter choices at all. Amongst individual smart measures, the ones most likely to receive reasonable or significant coverage in LTPs (all over 60%) were workplace travel plans, school travel plans and public transport information and marketing (see Table 2.1).

Table 2.1: Proportion of Local Transport Plans making reasonable or significant reference to smart measures

Smarter choice measure	Proportion of LTPs making reasonable or significant reference
Smarter choices as a whole	80.5%
Workplace travel plans	64.6%
School travel plans	69.5%
Personal travel planning	26.8%
Public transport information and marketing	68.3%
Travel awareness campaigns	42.7%
Car clubs	15.9%
Teleworking	8.5%
Teleconferencing	7.3%
Home shopping	2.4%

Source: DfT (2007)

2.4 Synergies with road user charging

Although by Autumn 2009 initiatives to introduce road user charging outside London had been largely abandoned or put on hold, a considerable amount of thinking about synergies between road pricing and smarter choices took place within local authorities who were bidding for Transport Innovation Funding (TIF) in the previous three years. This was largely because the Government made TIF funding conditional on local authorities developing a parallel programme of smarter choice measures.

In London, TfL commissioned an evidence review about the potential synergies (or otherwise) between smarter choice measures and road user charging (Cairns, 2007). This reviewed a range of evidence, including information relating to London's congestion charge, individual smarter choice measures, the effects of reducing road capacity for cars, London's 'free fares' policy, the fuel duty escalator, work on car dependence, driver opinion polls, research on parking and various population segmentation studies. Its conclusions included the following:

- A number of policies have already achieved behavioural reductions in the order of 10-20% of car driver trips. There are reports that best practice manages to achieve

significantly greater change than this, and a number of studies suggesting that the theoretical potential for change (i.e. some sort of upper limit of what might be achieved) may be in the order of 30-50% of car trips. This also implies that most sustainable transport policies are unlikely to yet be hitting any 'natural limits' to behavioural change.

- There are a number of cases where a combination of transport policy measures has led to more than double the behaviour change expected from the individual measures alone, meaning that significant synergies are possible, though the nature of synergies involved is often complex.
- Policies targeting car use in general (rather than specific journey purposes) tend to be most effective at reducing off-peak non-work car trips. However, some of the highest levels of behaviour change are reported from targeted initiatives specifically focused at changing work or school journeys. Meanwhile, different types of policy also evoke different types of behavioural response – for example, school travel plans largely achieve modal shift whereas personal travel planning may encourage a change of destination. This implies that a combination of different measures may help to encourage a more general 'package' of sustainable transport behaviours by individuals and may fruitfully target different types of trips.
- It seems that different initiatives are likely to encourage different types of people to change behaviour (or to change behaviour in different ways). There is considerable scope to assess whether the groups identified through market segmentation approaches as being likely to change behaviour correspond with those who actually do so, and how this varies with initiative.

The study also stressed the importance of context in determining behavioural change, and clarified that the available data on which to draw conclusions is limited.

In the West Midlands, a research programme to develop the road pricing strategy concluded that significant modal shift (over 10%) could be achieved with the right level of investment in smart measures as part of a 'lifestyle choice' package, focussing on workplace and school travel plans and general travel awareness campaigns (West Midlands Joint Committee, 2008).

In Greater Manchester, a Travel Behaviour Change Strategy submitted to DfT as part of the conurbation's TIF bid included an individualised marketing programme targeting some 500,000 households; workplace travel plans at large employers and area-wide travel plans at agglomerations of small employers; a Sustainable Travel to Education programme (including school and university travel plans and cycling initiatives); residential travel planning; car-sharing promotion; and development of car clubs (Association of Greater Manchester Authorities, 2007).

2.5 Inclusion in other national strategies

Smart measures have featured in a number of national policy documents published since 2004.

2.5.1 2004 White Paper: *The Future of Transport*

The potential for smart measures to change travel behaviour, and their value for money, were highlighted in the 2004 White Paper, *The Future of Transport* (DfT, 2004b), which was published at about the same time as the original smarter choices research. The White Paper committed to continue to promote smart measures by:

- ensuring every school in England had a travel plan by 2010;
- providing free consultancy advice for organisations creating workplace travel plans until 2006;
- setting a target for all Government departments to reduce car commuting by 5% by 2006;
- supporting local authorities in building smarter choices into their LTPs.

2.5.2 LTP Guidance

Greater use of smart measures was also advocated in Government guidance on both the second (DfT, 2004c) and third (DfT, 2009a) round of LTPs. LTP3 guidance identified smarter choice measures as an important tool for local authorities in mitigating climate change, and suggested that they contributed to all five of the Government's high level goals (economic competitiveness and growth; reducing carbon emissions; better safety, security and health; quality of life; and equality of opportunity).

2.5.3 Delivering a sustainable transport system

The Government's Green Paper, *Towards a Sustainable Transport System* (DfT, 2007b) highlighted the importance of the Sustainable Travel Town projects in Darlington, Peterborough and Worcester, and suggested that learning from these and other demonstration projects (including *Bikeability*, walking buses and station travel plans) would be critical in the period to 2013/14. It indicated that, subject to value for money tests, the Government would increase its investment in these initiatives in coming years. The subsequent document *Delivering a Sustainable Transport System* (DfT, 2008a) reiterated the role of smarter choice measures in reducing greenhouse gas emissions.

2.5.4 National Air Quality Strategy (NAQS)

The National Air Quality Strategy produced by the Department for Environment, Food and Rural Affairs (Defra, 2007a) listed smarter choices as an important complement to other policies for achieving air quality goals.

2.5.5 NATA refresh

The Government's summary of responses to its 2008 consultation on the methods of appraising transport schemes (New Approach to Appraisal, or NATA) identified two issues in relation to smarter choices (DfT, 2008b). First, current appraisal methodology is unnecessarily onerous for smarter choice strategies, which are commonly quite low-cost. In response to this, DfT is considering the potential for some form of 'light-touch' appraisal, which would make it easier to consider and appraise a range of low-cost strategies, including smarter choices. Second, conventional transport modelling tools do not currently allow the effective modelling of the impacts of smarter choices. This is also an area where DfT is now seeking to develop a better approach.

Separately, in 2007, new guidance on how to evaluate walking and cycling schemes was issued, bringing them within the remit of existing web-based Transport Analysis Guidance (or WebTAG) appraisal procedures (DfT, 2007c).

2.6 Changing context

Since the smarter choices report was published, there have been several important developments affecting the context of transport policy. The most notable include growing concern about climate change; interest in the links between transport and health; recognition of the value of low-cost or 'better use' transport measures; understanding that the population may be split into several different and distinct attitudinal segments in relation to transport; changes in the way cycling and walking are promoted; and recognition that the growth in car use may have reached a plateau.

2.6.1 Increasing concern about climate change

The Stern Review (HM Treasury, 2006), among others, put great emphasis on the urgency and importance of reducing the threat of profound climate change. Subsequently, in October 2008, the Committee on Climate Change (CCC) recommended that the target for greenhouse gas emissions should be a reduction of at least 80% below 1990 levels by 2050, with these figures to include the UK contribution to international aviation and shipping. The Government fully accepted this recommendation. In its December 2008 report, *Building a low-carbon economy – the UK's contribution to tackling climate change*, the CCC identified that the transport sector would need to make a serious contribution, and that this should come from both supply-side improvements in carbon efficiency and demand-side reduction. Its recommendation of an economy-wide emissions reduction of 34% by 2020 was also accepted by the Government. At the time of its 2008 report, the CCC had not carried out detailed analysis of the scale of contribution that might be made by demand-side measures, but this was ongoing during 2009.

The Department for Transport's carbon reduction strategy *Low Carbon Transport: A Greener Future* (DfT, 2009b) acknowledged the importance of changes in travel behaviour, alongside technology measures, but also suggested that transport behaviours are among the most difficult to change; that it was difficult to determine emissions savings from 'softer' policy measures; and that their effects may fade over time. Nevertheless, it argued

that sustainable travel initiatives, as pioneered in the Sustainable Travel Towns programme, were a key way for local authorities to reduce carbon emissions.

Other important policy documents that have highlighted the role of smart measures include the 2006 Energy Review (Department of Energy and Climate Change, 2006) and subsequent 2007 White Paper on energy (Department of Trade and Industry, 2007). This included a chapter on transport (for the first time) in which smarter choices were identified as the most important non-technical transport solution in the programme aside from the fuel duty escalator.

Part 2 of the King Review on Low Carbon Cars, published by HM Treasury in 2008, included four key recommendations about smarter choices (25-28), namely for all local authorities to ensure that smarter choices are a priority in their local transport strategies; for more widespread use of personal travel planning; that all large public sector organisations should have a travel plan by 2010; and that car clubs should receive more support.

As part of its work on climate change, the Government has also launched a national campaign, entitled *ACT ON CO₂*, which has included some marketing related to car sharing and greener driving. More details are given in section 2.10.5.

There have been several attempts to estimate the potential carbon savings from a large-scale Smarter Choice Programme. In 2005, DfT commissioned *Smart Carbon* (Anable et al., unpublished) to evaluate the potential contribution from a package of smarter choice measures equivalent to the high intensity scenario outlined in the 2004 smarter choices report. This suggested that there was the potential to save 5.1Mt CO₂ per annum by 2010 or after five years of implementation and 13.2Mt CO₂ by 2020 or after 15 years of implementation (based on the assumptions in the 2004 smarter choices report with regard to build-up of impact over time, and ‘locking in’ of effects through complementary demand management policies)³. On the basis of current projections, these savings are large in comparison to those expected to be achieved by many other transport policies in the UK Climate Change Programme (CCP).

Modelling by the DfT for the CCP (Defra, 2007b) however, assumed lower traffic savings than those calculated in the original smarter choices study. Analysis considered two extensions to the current Smarter Choice Programme: a ‘low’ scenario, which assumed a continuation of (then) current funding on a national scale, and a ‘high’ scenario, which involved much wider implementation of good practice. The low scenario was assumed to lead to a 1.4% reduction in traffic levels by 2010, and a 1.8% reduction by 2020. The high scenario resulted in a 4.2% reduction in traffic by 2010 and a 5.3% reduction by 2020 (i.e. after four or 14 years of application). The scenarios resulted in carbon savings of 0.7-3.7Mt CO₂ in 2010, and 0.7-4.8Mt CO₂ in 2020.

Most recently, the impact assessment of the carbon reduction strategy for transport (DfT, 2009c) modelled the case in which car trips (in urban areas only) were cut by 7% by 2020, and car mileage by 3.7%. This was found to lead to a central scenario in which carbon emissions fell by 0.9Mt CO₂ by 2020.

³ Originally reported in million tonnes of carbon: 1.4 MtC by 2010 and 3.6 MtC by 2020.

Thus, as summarised in Table 2.2, we see a difference of an order of magnitude in the estimated potential savings from smarter choice measures. This partly reflects different assumptions about the *policy focus* of these measures (with, for example, the latest DfT estimate assuming no impact outside urban areas, and a greater effect on short car trips, whereas the Anable et al. estimate assumes a contribution from non-urban areas and a policy design such that there is an equal effect on all trip lengths). It also reflects different assumptions about the *intensity* with which policy will be implemented in the future.

Table 2.2: Carbon savings from smarter choices under different scenarios (MtCO₂)

		2010 (or after 4-5 yrs)	2020 (or after 14-15 yrs)
Anable et al. ¹	Low intensity scenario	1.1	2.6
	High intensity scenario	5.1	13.2
DfT/ Defra ²	Low intensity scenario	0.7	0.7
	High intensity scenario	3.7	4.8
DfT ³	Central scenario	-	0.9

¹ Analysis conducted by Anable et al. (2005, unpublished) using the original smarter choices report (Cairns et al., 2004) calculations for traffic savings.

² Figures taken from Defra (2007b) *Synthesis of Climate Change Policy Appraisals* in which ‘An extension to the smarter choices programme’ was assessed.

³ DfT (2009) *Impact assessment of the carbon reduction strategy for transport*

2.6.2 Increasing interest in the links between transport and health

Prompted by concerns about obesity, there has been increasing interest in the role that transport measures can play in encouraging physical activity. In 2008 the Department of Health (DH) announced a Healthy Towns initiative, providing funding of £30 million over three years to designated towns to increase physical activity and encourage healthy eating. DH also made a direct contribution to the funding for Cycling England’s work. The examples of actions to increase physical activity given in the Healthy Towns invitation to bid were Exeter’s work as a Cycling Demonstration Town in building new cycle lanes and encouraging cycling to school and work; and Darlington’s work as a Sustainable Travel Town and Cycling Demonstration Town in building new cycle paths; running guided bike rides and a cycle loan scheme; and offering personalised travel information.

Meanwhile, Sport England commissioned the largest ever survey of sport and recreation in Europe⁴. The survey includes questions about walk trips lasting at least five minutes, and both walk and cycle trips lasting at least 30 minutes. The first phase involved a telephone survey of 363,724 adults in England (aged 16 plus), designed to be representative at local authority level. It was undertaken between October 2005 and October 2006. This was followed by a series of annual survey waves, which will continue until October 2010. Results are available on the web.

Separately, physical activity monitoring was undertaken in the Cycling Demonstration Towns in 2006 and 2009. This demonstrated that the interventions in these towns had reduced the proportion of their residents who were completely physically inactive, by 10% overall (and 13% in Darlington) (Cavill Associates et al., 2009). Cycling England

⁴ http://www.sportengland.org/index/get_resources/research/active_people, accessed 08/10/08.

noted that this town-wide increase in physical activity had been matched by few, if any, physical activity promotion projects in the UK (Cycling England, 2009).

2.6.3 Recognition of the value of low-cost or ‘better use’ measures

The Eddington Transport Study (2006) drew attention to the fact that ‘smaller-scale’ interventions (in this case meaning interventions costing less than £1 billion) commonly had better benefit-cost ratios than larger interventions. It identified a range of measures that make better use of the existing road network (‘better use measures’), including smart measures, and highlighted that these could have very significant environmental benefits through reducing or eliminating the need for additional road capacity. It recognised that there was a lack of evidence on the effects of ‘better use’ interventions, and that they might not be adequately considered as part of the option generation process. It also highlighted that the potential of smart measures (as identified in the smarter choices 2004 research) should be weighed against other factors, including the need for smart measures to be continuously reinforced, the lack of understanding of whether smart measures could be implemented on a wide scale, and the need for complementary measures to ensure the effects of smart measures are not lost (Eddington, 2006, p158). Advice on evaluating better use measures is discussed in section 2.7.

2.6.4 Increasing interest in public attitudes and market segmentation approaches

There has been a growing interest in understanding public attitudes towards transport issues, and developing market segmentation approaches to try to identify who is susceptible to changing transport behaviour, in what context, and according to what types of messages. As part of this, DfT has recently issued a new review of attitudes to passenger transport with a view to informing its proposed goals and challenges for 2014-2019 as published in *Towards a Sustainable Transport System*. Although the review is about attitudes and not travel behaviour change, it identifies various attitudinal ‘pressure points’ such as driving stress, perceptions of safety, the desire of children to cycle and the interaction of these with environmental motives, which are often explicitly addressed by smarter choices (Lyons et al., 2008). The report argued that it was misleading to discuss public attitudes to changing behaviour as though either ‘behaviour’ or ‘the public view’ was homogenous: rather, there was a wide range of potential responses ranging from rather small (though interesting) minorities able to consider completely giving up car ownership, through to large minorities or small majorities willing to consider significant though less drastic reductions in car use, and substantial majorities considering smaller changes in choices. Although attention was drawn to the distinction between intention and action, nevertheless it was argued that the broad orders of magnitude of change suggested in the attitudes was consistent with empirical evidence on change which had been observed due to other reasons (e.g. Goodwin, 2008).

Defra meanwhile published a segmentation model using attitudes to the environment to cluster the population into seven groups (Defra, 2008). By mapping these onto 12 headline pro-environmental behaviours (of which ‘using the car less for short trips’ was one), the public’s willingness and ability to act and the potential and motivation for behaviour change can be identified at a broad level.

Research conducted by Steer Davies Gleave in Darlington suggested that people vary in their response to smarter choice interventions such as the visit of a personal travel

adviser (SDG, 2008). Using qualitative interviews, eight groups were identified. These included ‘life-changers’, who make a fundamental change to their lifestyle as a result of a visit by a travel adviser, such as giving up a car and buying and using a bicycle (estimated at less than 1% of people); ‘modifiers’, who make a substantial change to their travel behaviour, such as changing their commuting mode, almost certainly because the travel adviser visit coincides with some external change; and ‘enthusiasts’, ‘interested’ and ‘stuck in the muds’, none of whom change their behaviour (Table 2.3). SDG concluded that ‘modifiers’ were a relatively small segment but were responsible for the bulk of the overall reduction in car trips.

Table 2.3: How people respond to smarter choice interventions

Life-changers	A very small proportion of people (less than 1%) ‘see the light’ as a result of a visit by a travel adviser and make a fundamental change to their lifestyle such as giving up a car, or buying (and using) a bicycle
Modifiers	The bulk of the mode shift is generated by this relatively small segment who make a substantial change to their travel behaviour by, for example, changing their commuting mode. They will almost certainly have a predisposition to change and the travel adviser visit will probably coincide with some external change
Enthusiasts	This group appear enthusiastic about changing their behaviour and getting fitter, saving the planet, or just saving money, but in reality only make minor, token changes
Interested	People who listen to the travel advisers and express interest, but never find the time to make changes
Stuck in the muds	Many don’t engage with the process and certainly don’t change their behaviour. Rather, they will post-rationalise their car dependence with apparently sound arguments about the lack of alternatives, their need for a car and how much more ‘convenient’ a car is
Rejectors	Some people will actively reject smarter choices and attempts to influence their behaviour – they are likely to react negatively to a travel adviser knocking on their door
Sustainables	A few people already use sustainable modes in preference to car, and further change for these people is very unlikely
Hard to reach	Young people and socially excluded who it is difficult to reach by traditional means, but who in fact are open to travel behaviour change because of they tend not to own a car

Table reproduced from Steer Davies Gleave (2008) *Darlington ‘Local Motion’ Protocol Analysis Research: workshop document*

2.6.5 Changes in the way in which walking and cycling are addressed

As previously mentioned, several national-scale smarter choice interventions designed explicitly to promote walking and cycling have been developed since 2004. For cycling, these include the development and roll-out of *Bikeability* cycle training; interventions to promote cycling amongst children, such as *Bike It, Go Ride* and most recently *Bike Club*; a programme of cycle links to school and school cycle parking; workplace cycle challenges; a ‘Cycle to Work Guarantee’ for large employers; a programme of investment in cycle parking at stations; and a cycle journey planner.

For walking, a key initiative is *Walking for Health*, coordinated by Natural England, which is estimated to have encouraged over a million people to walk more since 2000 through more than 500 local health walk schemes. The organisation Walk England has recently

been established as a social enterprise (independent of Government) to encourage walking, with some funding from DfT. Other walking (and cycling) initiatives are being developed by an Active Travel Consortium of NGOs.

2.6.6 New evidence of stabilisation of car use

Research published by the RAC (Lucas and Jones, 2009) suggests that some time around the late 1990s (between 1995 and 2002), mobility patterns changed. Before this date, car travel accounted for a steadily growing share of overall travel per capita, rising from around 70% at the beginning of the 1980s to 82% in 1995. Car and taxi mileage amongst adults rose from about 5,000km per person per year at the beginning of the 1980s to about 8,000km per person per year at the end of the 1990s. However, from the late 1990s onwards, there was a levelling off in car use, involving a small decline in the car share of total mileage (from 82% to 80%) and a stabilisation of the car share of all trips at 63-64%. Traffic levels continued to increase beyond the late 1990s, although at a slower rate, but this was due to an increase in the population of driving age combined with more rapid growth in non-car traffic.

The stabilisation in car use per capita since the late 1990s was not associated with economic downturn. Over the period in question, GDP continued to grow strongly (as did rail travel). Lucas and Jones argue that if this stabilisation is maintained, future growth rates for car traffic will be less than has historically been the case, and may simply mirror the increase in the number of adults in the population. They suggest that this may demand a reassessment of our long-term traffic forecasts. They also note that a study of driving patterns in the USA reached a similar conclusion, with vehicle miles travelled per capita having reached a plateau there in the year 2000.

In 2009, the AA and Trafficmaster reported substantial cuts in congestion on motorways and trunk roads in the period from May 2007 to July 2009. This does seem to be clearly linked to the decline in economic activity, although it is unclear to what extent it is the result of a decline in car traffic, as opposed to freight movements.

2.7 New DfT initiatives on smarter choices

A number of DfT studies and projects are seeking to develop understanding of how smarter choices can be implemented, and how their effects can be measured and incorporated into modelling, appraisal and evaluation. Those of most relevance are:

- the Sustainable Travel City – the Department has announced its intention to designate one or more Sustainable Travel Cities, to take forward the work of the Sustainable Travel Towns, but on a larger scale, and in a more metropolitan environment. The selected cities will receive Government investment of £29 million over three years;
- a smarter choices modelling website – the Department has launched a new e-community for those interested in modelling the effects of smarter choices, address: <https://www.dft.gov.uk/ecommunities/smarterchoices/>. Research is currently being undertaken to assess the capability and future requirements of transport models to model smarter choice measures;

- the development of new guidance on ‘light touch’ appraisal for transport schemes below £20 million. This will make it easier to appraise smarter choice schemes. It is due to be issued on WebTAG by April 2010 (with a draft available before then);
- the development of a research evaluation framework for ‘better use’ measures, including smarter choices. This was undertaken for DfT by Aecom (Faber Maunsell) and the Tavistock Institute and is being applied to scheme evaluation, in particular for an evaluation of Cycling England’s investment programme in the Cycling Cities and Towns and for Schools and Young People. This includes both evaluation of ‘whole town’ effects and evaluation of ‘intervention packages’, which typically combine smarter choice measures and infrastructure schemes.

2.8 Ongoing debate on reported effects of smart measures

Since the publication of the original smarter choices study, there have been a number of critiques of the reported effects of smart measures. Many of these relate, more specifically, to published data on the effects of personal travel planning, and are discussed further in 2.9.3. Among these contributions are two papers by the German researchers Möser and Bamberg (Bamberg and Moser, 2007; Moser and Bamberg, 2008), using a different methodology from that in the 2004 smarter choices study, namely a meta-analysis applying statistical methods to fit a multivariate equation to the results of the smarter choices review. The essence of Möser and Bamberg’s argument is that what they describe as the ‘narrative’ style of the 2004 smarter choices study was intellectually inferior to the method they favour of meta-analysis. We discuss this further below, but at this stage comment that the differences in their quantitative conclusions seem mostly to be very small, except in one or two cases where their conclusions seem to us to be unwarranted.

We note an undercurrent of wider concern among researchers who have sought to verify the results of particular studies about whether the results are robust and transferable. Some of this is due to the fact that smarter choices initiatives, being mostly small and local, rarely have the sort of research budgets which would do full justice to theoretical and practical problems that would be challenging even on huge infrastructure projects with budgets an order of magnitude larger. But some of it seems also to be due to difficulties of access to data, unprocessed survey results, details of the processing, and analytical underpinning from projects which have been carried out on a commercial consultancy basis. It seems that adequate transparency is not always achieved on these aspects.

2.9 Advances in relation to individual measures

2.9.1 Workplace travel plans

In February 2007, in conjunction with Campaign for Better Transport (CBT), DfT launched the National Business Travel Network, a forum (building on CBT's previous Ground Floor Partners network) intended to encourage more employers to get involved in travel planning. DfT has also published updated national guidance for employers – entitled *The essential guide to travel planning* (Taylor and Newson, 2008), and guidance for local authorities on establishing travel plan networks (AEA Technology, Cleary Hughes Associates and University of Westminster, 2005).

While an increasing number of local authorities and businesses have appointed travel plan coordinators, the Highways Agency has also become engaged in the travel planning process, with an Influencing Travel Behaviour programme which has worked with major employers at 'hotspots' on the trunk road network to reduce single-occupancy car commuting, generating benefit-cost ratios of between 4:1 and 13:1 (Smith and Emmerson, 2009).

Over time, the debate about workplace travel planning has progressed beyond 'does it work?' to a number of new strands of research. These include studies examining the business and health benefits from encouraging employers to adopt more sustainable travel (Hurdle, 2008; Davis & Jones, 2007); exploring the most appropriate strategy for central Government to adopt on the topic (Enoch and Ison, 2008a and 2008b); and identifying latest best practice in requiring travel plans through the planning process (Addison et al., 2009). There is also interest in the potential for tax reform to encourage greater take-up of travel plans by employers (Elliott, 2008). A new Masters course in 'Sustainable transport and travel planning' has been established at Loughborough University, with some pump-priming funding from TfL, with the aim of increasing the range of people with skills in this area. There is also the ongoing development of a national standard for travel plans (BSI, 2008). A key issue motivating much of the current work is attempting to ensure that the travel plans drawn up by employers are effective.

There has also been new analysis by Bamberg and Möser (2007) of the workplace travel plan data gathered as part of the 2004 smarter choices report. Whilst some of their conclusions (namely those relating to the key factors determining travel plan success) are disputed (see Cairns, Newson & Davis, forthcoming), their work generally endorses the conclusions of the smarter choices study in relation to the scale of traffic impacts that might be expected from 'typical' workplace travel plans (i.e. excluding those which were only just beginning, or which had been abandoned at an early stage).

Bamberg and Möser (2007) conducted two forms of analysis on a pooled dataset of 44 examples of workplace travel plans largely drawn from the evidence gathered for the smarter choices study. Their analyses confirmed that the cases examined could be considered to be a representative sample of travel plans – and that a different way of analysing the data produces a similar estimate of the impacts of workplace travel planning activity to that calculated in the original smarter choices research.

Specifically, the first of their analyses involved using a funnel plot to assess the representativeness of the selected travel plan examples, from which they conclude: "the

plot of the 44 studies shows a picture quite consistent with the expected funnel pattern. This result does not provide evidence that the representativeness of the database is threatened by severe retrieval or reporting bias⁵. Second, they conducted a number of analyses to estimate the change in car use that had occurred. In their opinion, “the most defensible estimate for the average car use reduction effect” was obtained by removing three of the extreme results, and calculating a “mixed effects weighted car reduction effect” from the remaining 41 cases. This calculation produced an average 11%-*point* car use reduction, from 64 per 100 staff before to 53 per 100 staff after – which would be equivalent to a 17% reduction in car use. This is similar to the smarter choices study’s estimate of an 18% reduction. Bamberg and Möser further conclude that, “the analyses indicate a probability of less than 1% that the car reduction observed after the introduction of work travel plans reflects only random fluctuation”.

2.9.2 School travel plans

School travel policy (and education policy in general) is clearly very dynamic. Since the original smarter choices report was produced, there have been a number of changes which will affect the nature of travel to schools in the UK – in particular, the encouragement for schools to operate an extended day, the emerging 14-19 agenda and the 2006 Education and Inspections Act. In this context, school access strategies are likely to become increasingly important to the success of other initiatives.

Since January 2007, all schools with travel plans have been required to provide data about children’s travel habits to the Department for Children, Schools and Families. This should provide a useful data source for new analysis in future years, particularly as increasing numbers of schools adopt travel plans – although there are concerns that there will be problems comparing this information with local authority data collected in previous years.

Since the publication of the smarter choices report, the DfT (2005a) has also published a first year evaluation of the 2003 UK Department for Education and Skills⁵/DfT ‘Travelling to school’ initiative (which aims for all schools to have a travel plan in place by 2010). The authors of the evaluation state that, “there was little evidence to suggest that there has been widespread modal shift, above that which may have happened anyway, in schools with school travel plans”. However, they also commented that “there has been relatively little time to see any benefit from the work” and “many issues with data quality and availability were encountered”. In short, then, this report highlights that school travel work is unlikely to achieve results quickly, and perhaps indicates that the policy emphasis on ‘having a travel plan in place’ as opposed to ‘achieving reductions in car trips’ may have encouraged adoption of rather weak travel plans. However, it does not undermine the evidence from the smarter choices report, which suggests that school travel planning – when done well – can be very effective. A parallel project, *Making school travel plans work*, highlighted that schools with good results had usually been working on travel issues for at least two years, and often a lot longer (Cairns and Newson, 2006).

Meanwhile, national funding for school travel work is continuing. In 2008, over £100 million was spent on the Travelling to School initiative. In 2006, DfT also set up a £15 million fund to support the development of walking buses, and other school walking

⁵ Now the Department for Children, Schools and Families.

schemes, over three years. Cycling England is also supporting a cycle links to school programme and increased cycle training, as described in section 2.3.4.

2.9.3 Personal travel planning

In 2002, DfT funded a series of 14 pilot projects on personal travel planning, which aimed to assess the effectiveness of the techniques in a range of different contexts. The work was independently evaluated by the DfT's Operational Research Unit (DfT, 2005b). Integrated Transport Planning was then commissioned to produce good practice guidance on undertaking personal travel planning initiatives, *Making Personal Travel Planning Work* (ITP, 2007).

At the time of the smarter choices study, most personal travel planning initiatives were small-scale pilots. The picture is now very different. In addition to the personal travel planning projects in the three Sustainable Travel Towns, large-scale personal travel planning programmes have been implemented in Brighton (targeting 100,000 people in four phases, completing in 2009); Bristol (9,000 households); Gloucester (8,000 households); Lancashire (50,000 households in Preston, South Ribble, Lancaster, Torrisholme and Morecambe); London (22,000 households in Kingston; 31,000 households in Haringey; 80,000 households in Sutton; 30,000 households in Camden); and Merseyside (3,500 households). A number of other local authorities are currently considering large-scale programmes.

Most personal travel planning programmes are delivered for local authorities by consultants, with the market leaders being Sustrans & Socialdata and Steer Davies Gleave. However, in Brighton the local authority took the decision to manage the programme in-house, using Steer Davies Gleave to build internal capacity.

As discussed above, some authors, including most recently Möser and Bamberg (2008), have questioned whether the reported results of personal travel planning programmes are robust and capable of being generalised. They examined the pooled results from 72 personal travel planning and public transport marketing campaigns from the UK, Australia, Germany and elsewhere and concluded that these indicated that 'on average the implementation of such a measure results in a 5%-point increase of the trip proportion not conducted by car'. In their dataset, the mean proportion of trips *not* conducted by car increased from 34% before the intervention to 39% afterwards. Although not stated in this form by Möser and Bamberg, this implies a reduction in car use of slightly less than 8%.

This conclusion seems broadly consistent with the evidence presented in the original smarter choices study, based on the smaller number of examples available at that time, that personal travel planning typically reduces car driver trips amongst targeted populations by 7-15% in urban areas and rather less (2-6%) in rural areas.

However, Möser and Bamberg go on to question whether there may be a reporting bias in which personal travel planning studies are described in the literature. They comment that a funnel plot of the different evaluation studies fails to show the expected relationship between 'effect size' and study sample size (i.e., simply put, that one would expect a greater variability in reported effect amongst evaluation exercises with small sample sizes than amongst evaluation exercises with larger sample sizes). They argue that there are two possible explanations for this: a 'positive' one that the homogeneity of

results reflects the high degree of standardisation of the personal travel planning process by the companies who carry it out; and a 'negative' one that the agencies responsible for personal travel planning programmes tend only to report results of studies which are perceived to have been successful.

Möser and Bamberg's argument has been rebutted by Wall et al. (forthcoming), who highlight that the meta-analysis conducted by Möser and Bamberg contains a substantial number of data errors introduced by the authors, and that it treats several distinct interventions (personal travel planning, travel awareness campaigns and public transport marketing) in a single group. Nevertheless, there remains a significant body of commentators who argue that reported results in relation to personal travel planning may be subject to systematic bias (see for example Bonsall, 2009; Chatterjee, 2009; Stopher et al., 2009). Others (e.g. Cohen, 2009) argue for a pragmatic response, suggesting that while personal travel planning is not yet a mature intervention, further effort both to measure and to understand its impact is worthwhile.

2.9.4 Public transport information and marketing

Marketing of public transport services is generally seen as being the responsibility of commercial operators, and there has to our knowledge been rather little published research into the effectiveness of information and marketing campaigns since the publication of the original smarter choices report.

In 2007, DfT published an evaluation of its *Kickstart* funding programme, which is designed to support new bus services in achieving commercial viability by the end of a defined subsidy period (Bristow et al., 2007). The study found that there was a considerable difference in the amount of marketing between schemes, but that in some cases operators offered free tickets in association with information leaflets about the new service; organised door-to-door leaflet drops to properties along the route of the planned service; produced 'tailored' timetables for different sections of the route including residential areas and employment locations; carried out a telemarketing campaign (phoning households along the route of the service and offering free travel tickets to households which had not used it); employed a marketing officer to work with businesses on an industrial estate; and amended timetables as a result of consultation with employers on shift patterns. However, Bristow et al. report that marketing tended to be confined to an initial 'push' at the time of the launch, and that there was little evidence of a sustained marketing effort over time.

Meanwhile, some (but not all) bus operators and managers retain a fair amount of scepticism as to the merits of any form of marketing. We are aware of individual exceptions to this, such as bus operators working with a university to map home locations of staff in order to better meet demand (Arriva in Aberystwyth); or piloting television advertising (Stagecoach), but it is perhaps inevitable in an industry with low profit margins and sometimes intense competition that there is rather little publicly-available information about the approaches to marketing of their services that are being taken by the main companies.

The Local Transport Act 2008 has put more emphasis on formal bus quality partnerships, and it remains to be seen how the increased powers for local authorities to define and develop public transport services may result in a more integrated approach to marketing and information.

2.9.5 Cycling and walking information, marketing, training and events

As discussed in sections 2.3.4 and 2.6.5 above, smarter measures specifically targeted at walking and cycling were not examined in the 2004 smarter choices report, mainly because, at that time, they did not exist on a large scale.

Since then, there has been a substantial development of such measures, particularly in relation to cycling, with the 18 Cycling Towns and Cities selected by Cycling England providing a focus for the development and trialling of new initiatives. For example, *Bikeability* cycle training has been adopted by half the local authorities in England (and is also being promoted in Wales). By 2012, it is anticipated that 500,000 children will have received *Bikeability* training. Sustrans' scheme *Bike It* worked intensively with 443 schools in 55 local authorities during 2008.

2.9.6 Travel awareness

In January 2008, the National Travelwise Association merged with the Association for Commuter Transport to become ACT Travelwise. The aim of the organisation is: "to support our members in their work to promote sustainable travel through provision of first-class learning opportunities, partnership working, marketing support and networking events, all with a specific focus on building expertise and experience in travel planning and other cost-effective demand management measures"⁶.

In March 2007, *ACT ON CO2* was launched. This is a cross-Government awareness-raising initiative about saving carbon, currently involving Defra, DfT and Communities and Local Government (CLG). There has been strong focus on encouraging 'greener driving', the purchase of less energy consumptive cars and car sharing. From September 2008, it has included television advertising, though this is currently focused on saving energy in the home⁷.

2.9.7 Car clubs

Car clubs have grown significantly since the publication of the first smarter choices report, with new commercial providers emerging (Streetcar, Whizzgo Europe and Zipcar in addition to the original City Car Club). According to the Carplus website, in 2008 there were 42 car clubs running in 37 towns and cities across the UK, representing over 45,000 members using around 1,500 cars⁸. Growth has been concentrated in large cities, especially London which had 85% of UK car club membership (more than 38,000 car club members) and over 1,000 car club vehicles in 2008 (TfL 2008), rising to 53,000 members in March 2009 (TfL 2009).

In 2004, DfT produced new guidance on 'car clubs and car sharing schemes' (TTP et al., 2004). TfL commissioned research on car clubs from Synovate (2007). This included 1,375 online interviews with car club members in London. On average, car club members reported that they had reduced the number of days per year that they drove a

⁶ <http://www.acttravelwise.org/about-us>, accessed 10/10/08.

⁷ <http://campaigns.direct.gov.uk/actonco2/>, accessed 10/10/08.

⁸ www.carplus.org.uk, accessed 10/10/08.

car from 64 to 41, implying a potential reduction in car use in the order of 36% (though unfortunately, it is not possible to translate this finding into the impact of introducing a car club on overall car travel in a local area). Before joining, 55% of the sample owned or had access to a car in their household, compared with 26% afterwards, and the average number of cars per car club member fell from 0.77 to 0.35. Some 19% of the sample explicitly reported selling a car as a result of joining the club, with longer-term members more likely to have done so. The study also included a range of other interesting results. In particular, it suggested that car club members appear to have a fairly specific profile, and are more likely to be male, young (particularly age 25-34), white, working, and living in inner (rather than outer) London (although this last point may be due to where car clubs have been established). Comparison with the results from a survey of 364 non-members also suggested that members were more likely to be highly educated (with 85% members having a degree or higher qualification) and to earn over £50,000 a year (42% of the sample).

Ongoing work by TfL in relation to car clubs includes a saturation study (with LB Camden and Islington) to understand the potential market for car clubs in London, how quickly it is likely to grow, optimum levels of vehicle provision and practical issues in terms of meeting demand for car club parking; research on the impacts of car clubs in London on congestion, pollution and mobility; and an evaluation of a car club marketing campaign (Rowe 2009).

Myers & Cairns (2009) analysed the results of an annual survey of car club members conducted by Carplus, for 2008/09. From 5,924 respondents, 39% reported that they had reduced the number of cars in their household as a result of becoming a car club member, and around a quarter said that they would otherwise have purchased a vehicle. Hence, each car club vehicle was estimated to result in an average of 14 private vehicles being sold, and a further nine not being purchased. The results also indicated that car club members made less frequent car trips as a result of joining, and that, compared with National Travel Survey data, they were making considerably fewer journeys involving a car, lift, taxi or motorbike than the average person (16-23% of their journeys, as compared with 66%).

2.9.7 Car sharing

As highlighted above, DfT has published guidance on car clubs and car sharing (ITP et al., 2004). Car sharing is also being promoted as part of the *ACT ON CO₂* campaign. In 2008, DfT published research on car sharing (Robinson, Humphrey and Budd, 2008), based on a module of questions included in the NatCen Omnibus Survey in July to September 2007. Of those surveyed, 61% had taken part in some form of car sharing in the past month; 28% said the lift took place at least once a week; 25% of those receiving a lift said the last journey was for work/business related; and 1% of respondents said they were a member of a formal lift sharing scheme run by their employer or other organisation. At the 2007 Motor Show, visited by 500,000 people, the main banner above the DfT stand promoted car sharing, greener driving and more efficient vehicle purchase.

2.9.8 Telework and teleconferencing

TfL has commissioned some research on telework and teleconferencing (Christodoulou et al., 2006), and some promotion of these options takes place via its workplace travel plan programme. Among the conclusions of the Christodoulou research were some

inferences drawn from National Travel Survey data that challenge the proposition that teleworking can reduce travel, although there are views that dispute this interpretation.

Research published by DfT (2009) based on National Travel Survey data suggested that the proportion of people who work from home at least monthly has increased slightly, from 10% in 2002 to 12% in 2007. Amongst people who did not work from home, 13% said it would be possible to do at least some of their work from home. Through qualitative follow-up interviews with National Travel Survey respondents who worked from home at least some of the time, an effort was also made to ascertain whether people who worked from home travelled less. This study identified two broad groups in terms of their travel patterns. One group had high travel requirements, for work or for other purposes, and working from home was part of a strategy to help them manage their travel needs more efficiently. The other group had lower travel needs and reported that working from home led to a decrease in their travel. The study also suggested that teleworking can displace trips to less congested times.

There has been particular interest in teleconferencing as a way of reducing air travel. WWF funded research into the activities of the top FTSE 350 companies, which showed that teleconferencing represents a viable option for a significant proportion of business flights (WWF, 2008). The organisation is now running a '1 in 5' campaign, challenging businesses to sign up to cut their air trips by this amount. The Campaign for Better Transport has also commissioned research into the viability of teleconferencing (and high speed rail) as an alternative to air travel. Cairns (forthcoming) provides a recent review of the empirical evidence about whether teleconferencing can cut business travel.

A review of evidence on business attitudes to transport (Lyons et al., 2009) included examination of measures adopted by businesses to reduce work-related travel. Earlier research (RAC and BCC, 2007; IoD, 2006) cited in Lyons et al., (2009) suggested that between 36% and almost 50% of companies surveyed had introduced, or had a policy on, teleconferencing.

2.9.9 Home shopping

There have been a number of reports looking at travel for shopping (notably RAC, 2006; Sustrans, 2006; and Derek Halden Consultancy and the Stirling Institute of Retail Studies, 2006), though none of these have put particular emphasis on home shopping.

Evidence from the National Centre for Social Research Omnibus Survey and the National Travel Survey indicates that there has been an increase in home shopping in the last six years (DfT, 2009d). The proportion of households ordering goods by internet, phone or post for home delivery increased from 64% in 2002 to 73% in 2008, and the proportion doing this on a monthly basis increased from 27% to 37% over the same period. Use of the Internet seems to be largely responsible for this growth, with the proportion of deliveries ordered via the Internet increasing from 26% to 73%.

Meanwhile, a survey of weekly Internet users by Lyons et al. (2003) found that 24% of respondents reported spending either a lot less or a little less time travelling because of their use of the Internet for grocery shopping, and 43% reported spending a lot less or a little less time travelling because of their use of the Internet for other shopping (with, in both cases, the great majority of the remainder reporting that their use of the Internet had not affected the amount of travel they did).

Edwards et al. (2009) compared the carbon footprint of conventional shopping and online shopping for non-food products. For small non-food items, such as books, CDs, clothing, cameras and household items, they found that a typical van-based delivery produced 181g CO₂, compared with 4,274g CO₂ for an average trip to the shops by car and 1,265g CO₂ for an average trip by bus. This suggested that a customer shopping by car would have to have bought at least 24 items per car trip in order for their shopping to be more carbon-efficient than separate home delivery of each item. For customers shopping by bus, at least seven items would have to be purchased per trip in order for emissions to be less than those resulting from home delivery.

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