Exploring public attitudes to climate change and travel choices: deliberative research

Final report for

Department for Transport

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Contents

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Executive Summary

Introduction

Background

In the UK, transport accounts for around a quarter of domestic greenhouse gas emissions. Behavioural change is seen as an important component in reducing this, both by reducing the amount of emissions from transport and by reducing the proportion of emissions from transport relative to other sources of emissions. There is a wealth of Government and academic research on attitudes to climate change and transport behaviour which shows that whilst the concept of climate change is well recognised across a broad spectrum of the population, understanding of the science, and the implications of climate change is very mixed and generally limited. Even where attitudes suggest that climate change is an accepted problem, behaviour change does not necessarily follow. The Department for Transport (DfT) commissioned People Science & Policy Ltd (PSP) and the Institute for Transport Studies at the University of Leeds (ITS) in November 2006 to explore this attitude-behaviour gap.

Aims and objectives

The DfT's research objectives for this project were as follows:

1) to explore public understanding of, and engagement with, climate change;
2) to identify and explore the barriers and incentives to behavioural change which could result in reduced impact of personal travel behaviour on climate change; and
3) to explore the role of information (especially scientific information) in improving public awareness, understanding of, and attitudes towards, travel behaviour and climate change and its potential for influencing behavioural change.

Importantly, DfT was concerned to identify whether there were any differences between social groupings, and if so what they might be.

Research design

Approximately 30 members of the public were recruited in each of five locations across England to take part in five meetings held in their local area. Each meeting involved qualitative exploration of a range of issues related to the research objectives and included deliberation of information provided as part of the research. The meetings were spread over a period of approximately 10 months (March 2007-February 2008), during which time participants were asked to complete four seven-day travel diaries. At the first and last meetings participants also completed questionnaires that enabled tracking of individual responses to some key attitudinal questions. About five months after the last meeting a sub-group of participants were interviewed by telephone in order to further explore barriers and motivations to changes in travel behaviour.

Attitudes to climate change

Awareness and acceptance of climate change

All participants were *aware* of climate change as an issue and it was seen by most as important and serious. The responses to both questionnaires show that **the vast majority accepted that climate change is happening**, although a very small number of people remained sceptical throughout the project.

Levels of concern about climate change were increased by the provision of information and subsequent deliberation, which left participants feeling more certain that it was happening and accelerating as a result of human activity. Generally it was amongst men that most change was seen. Men became more accepting of, and concerned about, climate change, reaching the levels of concern expressed by women from the outset. By the end of the research there was no difference between the attitudes of men and women.

Understanding of climate change

Initially, **understanding of the causes of climate change was limited and confused.** Greenhouse gasses were mentioned as a cause by some but most participants did not know what these gases are or how or why they have an impact on the climate. While awareness and acceptance were high, **fewer participants accepted that climate change is the result of human activity rather than a result of natural variations. Most did not understand the role of carbon dioxide emissions** in climate change, there was therefore little understanding about the need to reduce carbon dioxide emissions and thus some **did not understand why Governments are asking people to change their behaviour**.

There were also **misconceptions about the relative importance of different sources of emissions** which impacted on the actions people think need to be taken. In general this seems to be related to confusion over emissions from factories and diesel vehicles which can be seen or smelt, while carbon dioxide is invisible and odourless.

Whilst a **majority of people in all socio-economic groups agreed that climate change is caused by human behaviour**, those in the highest social grades (AB) were more strongly convinced that this was true than those classified as social grade C1. Several participants remained sceptical about there being a link between human activity and climate change throughout the project.

In general, participants were **unaware of the extent of their personal contribution to climate change** with respect to their travel patterns but also with respect to their behaviour more broadly. A **major barrier to behaviour change is the perception that individual impacts are insignificant**. This may demotivate some people from changing their behaviour and it indicates that many people are not sure what they could change and to what effect. Moreover, **only about half of the participants believed that they *personally* had an impact on climate change** through their behaviour and this proportion did not change significantly throughout the project.

On average, 20-29 year olds differed from other age groups by being less likely to accept that climate change is made worse by their personal contribution. Those in higher socio-economic groups (ABC1) were significantly more certain that they personally contributed towards climate change than those in lower socio-economic groups (C2D).

The main **benefits of climate change for the UK were seen to be better summers** and milder winters. The **main negative** impacts were thought to be the **possible impacts on human health**, such as increased risk of skin cancer and the exacerbation of conditions like asthma. There was also a belief that there would be an impact on the weather more widely, lower rainfall and 'extreme weather' were mentioned, especially flooding. Despite the many negative impacts that were mentioned, **climate change was not seen as a day-to-day issue for Britain**; participants thought that other countries would be more affected.

Participants continued to believe that they personally were less likely to be affected than their children and grandchildren, despite information suggesting that impacts are likely to occur sooner.

By the end of the project the participants believed that they were much better informed and with the exception of timescales, understanding of the issues and of the causes of climate change grew.

Existing, potential and actual low CO_2 travel behaviours

Existing low CO_2 emission travel behaviour

Some participants had taken action to reduce their carbon consumption before their involvement in the project. This was mainly actions within the home. Some of this group were **initially hostile to being asked to do more**.

Willingness, ability and intention to change

At the start of the project just over a half of the frequent drivers were willing to reduce their car use and this increased significantly over the course of the project to almost three-quarters. Women frequent drivers were more likely than men to see reductions as practical and they saw themselves as more willing and able to reduce their car use than men.

Generally, participants concluded that changing their travel behaviour would be good for their budgets and health, as well as for the environment. **Carbon dioxide reductions were generally of secondary importance, an incidental spin-off from personal benefits.**

Reported change

The main behaviour changes which participants were prepared to undertake in the short-term can be summarised under three headings.

- **Reducing unnecessary trips**
  Participants saw opportunities to combine journeys and reduce the number of trips by planning better, particularly for shopping trips. Time savings to individuals were identified as a clear benefit as well as some cost savings. However, this behaviour is reliant on planning and is not always sustained.

- **Living more locally**
  Participants were amenable to using local facilities and shops when they could. Where local facilities were available some participants were also amenable to sometimes walking and cycling, particularly in good weather and where good facilities exist. This was seen to be healthy. However, carrying heavy bags and restricted product choice mean there is limited scope for sustained behaviour change.

- **Being fuelwise**
  Even those drivers with little interest in climate change felt able to take actions such as removing unnecessary weight from the boot, pumping-up car tyres and driving more steadily. However, many took these actions because they were involved in the project and felt the need to try to do something. It will be important to demonstrate the financial savings this can generate to be effective with the wider public but the fuel savings were not observed by all.

Our results suggest that **people seem more capable of, and amenable to, making adjustments to their trip patterns than changing the mode of transport they use.** Participants did not initially appreciate how many trips they made and they seemed to think more in terms of what they wanted to do, rather than the distance to be travelled. It is important to note that the participants were not generally able to estimate their carbon consumption, which in any case means little to them. **The behaviour change activities that seem to be more acceptable have a range of benefits to individuals including financial, time, health and environmental and are perceived by participants as easy to incorporate within existing lifestyles.**

Explanation of changes

We examined the strength of the relationships between participants' actual travel behaviour, their stated intentions regarding car and van use and their climate change beliefs. **Where intentions to decrease car use to reduce climate change existed, they were formed primarily on the basis of whether people felt able to take action and whether they felt a personal responsibility to act to reduce car use for environmental reasons**. Taking part in this project strengthened the link between feeling able to take action and feeling a responsibility to take action, suggesting that intentions to reduce car use can be strengthened.

Previous research has suggested that attitudinal measures would be more likely to explain differences in behaviour than socio-demographic variables. Of all the attitudinal variables collected, **those who reduced their carbon consumption over the lifetime of the project had significantly greater feelings of personal responsibility for taking action than those who did not**, both initially and at the end of the study. Despite this, no significant relationship between strength of intentions to reduce car use and the actual number of car trips was found. This confirms that the relationship between intentions and behaviour is complex. For the majority of people **however much they believe they need to change their travel behaviour for the sake of climate change, and actively want to do so, information about climate change and individual contributions alone seems unlikely to achieve change.**

Influencing travel behaviour

The behaviours participants reported being willing to try and seemed to achieve were generally those which allowed them to continue leading their lives in a similar way but with small and easy adaptations. For example, reducing the number of unnecessary journeys by planning ahead and combining trips were often seen as possible and feasible for at least some of the time. This is why domestic behaviour appears easier to change.

There is no social pressure to change travel patterns to reduce carbon consumption but neither is doing so perceived as socially unacceptable.

Barriers to change are focused on practical issues such as the perceived reliability of certain transport modes, and the cost of transport choices, although people are prepared to pay for convenience. There were also lifestyle barriers associated with the need to travel quickly between geographically dispersed locations to complete day-to-day tasks (such as going to work and taking children to school), personal autonomy, choice and aspirations. Often these barriers had led to ingrained habits that are hard to break.

The context of the journey is important, that is the factors surrounding the trip such as the importance of arrival time and what has to be taken on the trip. This has more bearing on decisions about how to travel than the purpose of the journey.

Participants preferred regulation, through restricting access to high CO_2 options, **to taxation, seeing this as less regressive and as having more impact.**

This research was qualitative and exploratory in nature. On the basis of the in-depth discussions and attitudinal study work we can conclude that there may be five or six attitudinal groupings within the UK population which will respond to different types of messages. The key **underlying factors** which help to define these are:

- **lifestyle image and aspirations;**
- **level of personal control over taking action; and**
- **strength of feeling of personal responsibility which, in turn, seems to be conditioned by the strength of belief in:**
    - **the role of human activity in causing climate change; and**
    - **the impacts of individual actions.**

The planned DfT quantitative segmentation study will validate this and clarify the groupings but this research confirms that such study is needed to enable targeted messages.

Motivators and barriers to action

Participants only took account of the cost of petrol (and sometimes parking) when comparing costs between car and public transport; other costs were deemed irrelevant because they would not relinquish their car, although they would consider using it less.

Perceived reliability is the key barrier preventing widespread use of public transport, although perceptions of cost and availability are also important. Buses are particularly disliked compared to trains because of their perceived condition but rail travel can be

attractive, especially for long journeys. **Awareness of travel planning websites is very low and their use was not yet embedded** in participants' minds. Access to information on departures and fares is therefore still perceived as a barrier to travelling by public transport.

Many car users saw walking and cycling as preferable to using public transport for short trips because of the greater perceived level of personal control. However, personal safety is a concern. With respect to walking, some participants were concerned about being attacked and when cycling they were concerned about the danger from traffic.

Awareness and understanding of the range of vehicle fuels on the market was very limited and the level of carbon dioxide emissions was not an important factor in car choice.

Many people were prepared to try to drive more efficiently and to trip chain but the concept of car sharing was not popular and was seen as working against trip chaining. **Car sharing was seen as inconvenient** impacting on personal control and working against stopping to complete other tasks. There were safety concerns about public car share websites but support for company schemes where sharers would be screened.

Internet shopping for food was popular with some participants but for many it did not fit with their mindset about food shopping.

Participants were unwilling to consider alternatives to flying to holiday destinations because they perceived that politicians and celebrities fly frequently. Carbon offsetting schemes were unfamiliar and viewed with scepticism.

Employers were said to be resistant to home working and for many occupations it is not feasible (e.g. building and teaching).

Information and its impact

Awareness and use of information sources

Participants had heard about climate change via all the traditional national media sources, both press and broadcast, however, new media also played a role.

Trust

Some participants were initially **sceptical of Government's role** in the climate change debate and suspicious that the Government was using the issue as a way to raise taxes. There were concerns from a number of participants that Government was telling others to act, whilst doing little itself. Participants were also **highly sceptical of the media**.

There was some initially scepticism over the role of scientists and the perception that there were differences of opinion amongst the scientific community led to suggestions that scientists might be driven by their own agendas. **Following participants' direct interaction with scientists, their trust in scientists grew**. The opportunity for participants to interact directly with scientists was regarded as especially valuable by the majority of participants.

Information needs

Across the five groups requests for information fell under five broad headings:

- the science of climate change;
- technological innovations for reducing the impact of transport on climate change;
- best practice in transport planning to increase cycling and the use of public transport;
- UK transport policy; and
- what individuals can do to reduce their impact on climate change.

Impact of information provision and deliberation

Being involved in the project had an impact on the importance participants attached to climate change. It also meant that most participants felt obliged to try at least one or two behaviour changes, although not all did so, despite committing to trying.

All participants reported feeling better informed, with a better understanding of the causes of climate change and the role of human activity. Deliberating with others enabled an exchange of experiences that impacted on what actions individuals were prepared to try. Importantly, it revealed their core beliefs and values and how this relates to willingness and ability to change travel behaviour.

Conclusions and implications

Widespread awareness and acceptance does not necessarily **mean widespread engagement with** climate change and **the need to change behaviour**. **Travel behaviour is primarily driven by cost and convenience** with individuals striking a personal balance between these factors.

The **key pieces of information about the causes of climate change** for the participants were:

- that climate change is **resulting from human activity**;
- the **speed** at which climate change is happening;
- the **relative contribution of different sectors** to climate change; and
- the **impact individual action** can make.

Communication **messages** about climate change need to be **simple and grounded in experiences** which people can understand in a local and personal context. Specific and tailored information gave participants a better understanding, and increased their engagement with climate change issues. Communicating the **contribution of personal transport decisions** is key.

Communication messages about **what actions people can take** need to highlight how **easy and cheap** it can be to take action and the extent of the impact of individual actions. Participants were disappointed to learn that that there was no ‘magic bullet’ in terms of either personal actions or new technology. Information about the impact of carbon savings helped to put individual efforts into context and make them seem worthwhile. Participants wanted specific information about the relative carbon savings of different actions.

To achieve maximum impact from encouraging behaviour change, climate change should be built-in to other messages – "save money", "be healthy" – measures which have these synergies are more likely to be appealing and stimulate action. Almost everyone related to the concept of saving money.

Whilst in the short-term behaviour change messages might usefully focus around the three behaviour changes which seem most likely to be successful: reducing unnecessary journeys, living more locally and driving fuelwise, there are some other key options for reducing carbon use which are poorly understood. These include the benefits of different fuels, vehicle efficiency and the benefits of home shopping or working at home. **People need to know the relative benefits of specific actions**. Most are unlikely to seek information or to use a carbon calculator. People need to be convinced of the **benefits to themselves and to the environment**.

Information alone, especially about the nature and causes of climate change, is **unlikely to make a substantial contribution to cutting carbon consumption**.

Glossary of Terms

This glossary has been compiled with reference to Reber A and Reber E (2001).

Antecedent beliefs: a set of beliefs that precede and result in an action. So, for example, attitudes towards behaviour are preceded by a set of beliefs about the behaviour in question and its outcomes.

Attitudes: generally any values, beliefs or opinions.

Attitudes towards behaviour (ATB): a set of learned (positive/negative) beliefs about a behaviour, its context and its outcomes that result in a tendency to respond in a particular way in a particular situation. The psychographic questionnaire was specifically concerned with ATBs regarding climate change as an influence on car/van use and reductions in use of said modes.

Available: refers to whether an option is perceived to be at the participant's disposal.

Behaviour: the behaviour of concern to this project was travel behaviour in the light of climate change, for example, mode choice, trip chaining or driving style, and for the psychological analysis it was specifically car/van use.

Behavioural intention (BI): an individual's intention to carry out a specific behaviour - in the case of this project to reduce their car/van use in the context of climate change.

Beliefs: acceptance that something exists; is true or false. Beliefs are subjective.

Carbon non-reducers: those who either increased or had no change in their carbon consumption between the first and the last travel diaries.

Carbon reducers: participants who reduced their carbon consumption between the first and the last travel diaries.

Cleaner Fuels: this included higher octane petrol which can lead to more efficiency in modern cars; bio-fuels and blends of bio-fuels with diesel and liquid petroleum gas in which the concentration of carbon is slightly less than in ordinary petrol. Whilst many types of bio-fuels exist these distinctions were not made clear, nor were apparently understood by participants.

Cognitive dissonance: the feeling arising from conflict between an individual's attitudes and their behaviour.

Entry diary: the first travel diary completed by participants before the first meeting.

Evaluation form: short form to provide feedback on the research process. Mainly concerned with assessing whether the information provided was comprehensible, well presented and met participants' needs and whether the meetings had been well facilitated. It also included a few questions on attitudes for comparison against the recruitment questionnaire.

Initial questionnaire: the psychographic questionnaire that participants completed after an initial discussion on environmental awareness in the first meeting. There were two versions, one for frequent drivers and one for infrequent drivers.

Exit diary: the fourth and final travel diary completed before the fifth and final meeting.

Feasible: refers to whether a participant perceives an option to be practicable for them.

Final questionnaire: the psychographic questionnaire completed at the beginning of the fifth and final meeting. There were two versions, one for frequent drivers and one for infrequent drivers.

Frequent car driver: drives a car at least once a week. "At least once a week" means at least a single one-way trip per week.

Habit: specific response(s) to a situation performed without conscious decisions, for example, for many people catching the train or driving to work every morning does not involve detailed thought or planning every day.

Infrequent car driver: drives a car less than once a week. "Less than once a week" means less than a single one-way trip per week.

Lifestage group: the five groups of members of the public were recruited to represent, in a non-statistical sense, five broad lifestage/income groups (see section 2.2.2 for more details). These were:

> *Educated Professionals:* individuals aged 45 and over with above average incomes and in, or retired from, professional or managerial occupations (social grades AB). This group had the highest level of carbon dioxide emissions.
>
> *Middle Class Families:* aged 30-44, this group was mainly employed in managerial and clerical occupations (social grades ABC1). They had above average levels of carbon usage from their travel compared to the UK average.
>
> *Younger People:* aged 20-29 from a spread of social grades and range of carbon consumption from transport.
>
> *Less Affluent Mature Families:* aged 45-64, their occupations were administrative, clerical and skilled manual (C1C2) and they had relatively lower levels of carbon use from their transport.
>
> *Less Affluent Younger Families:* occupations were clerical, administrative and skilled/semi-skilled manual (social grades C1C2D). They were aged 30-44 and had relatively lower levels of carbon consumption from their travel.

Meetings: there were five meetings of the members of the public who took part; the first three took place over a relatively short period, the fourth and fifth took place later.

Participants: members of the public who took part in the project.

Perceived behavioural control: perceived ease or difficulty of carrying out a behaviour successfully, assumed to reflect past experience as well as anticipated practical impediments and obstacles (Ajzen, 1988) e.g., perceived ease or difficulty of reducing car/van use.

Personal norms: morals and responsibilities that are important to an individual (what an individual thinks they should do in a given situation). An individual will (to some extent) consider the consequences of a behaviour for their self-image in light of their morals before engaging in a behaviour. Behaving inconsistently with personal norms results in regret, and sufficient anticipated regret will prevent an individual undertaking a particular behaviour. Personal norms are sometimes referred to as moral norms. (Definition and explanation developed from De Pelsmacker and Janssens, 2007.) Personal norms include, or at least draw on, identity (Shepherd and Sparks, 1992).

Psychographic questionnaire: questionnaire collecting data on psychological variables, for example, attitudes, norms and other beliefs.

Recruitment questionnaire: questionnaire used to screen potential participants for their suitability for the project. Mainly designed to ensure those recruited met the profile for the group, it also contained some attitudinal questions to ensure a spread of views on environmental issues in each group.

Significant other: somebody who is important and influential (provides a point of reference) in an individual's life. Usually that somebody (e.g., parents) will be influential in the individual's development of social norms, values and self-image. (Definition taken from Reber and Reber, 2001.)

Social norms: see subjective norms.

Socio-economic groups: we have used the socio-economic groupings: A: professionals and senior managerial occupations, B: managerial occupations, C1: clerical and administrative occupations, C2: skilled manual occupations, D: semi-skilled manual occupations and E: wholly dependent on state benefits. These should not be confused with the lifestage definitions.

Stages of Change Model: see Transtheoretical Model.

Subjective norms: an individual's perception of social pressure from significant others to perform (or not) a specific behaviour (for example, to travel by car or van). These subjective norms are a reflection of general social norms, and for the purpose of this report can be interpreted as social norms.

Theory of Planned Behaviour (Ajzen, 1988): an explanatory theory of behaviour stating that behaviour is the result of behavioural intentions and perceived behavioural control. Behavioural intentions result from a combination of attitude towards behaviour, subjective norms and perceived behavioural control. The theory has also been extended to include other precursors of behavioural intentions, particularly personal norms and habit.

Transtheoretical Model (Prochaska and Di Clemente, 1983; modified by Sutton, 2001): a model that explains the process of behaviour change. The model sets out five stages of change: pre-contemplation, contemplation, preparation, action (change), and maintenance. Whilst there is a linear relationship between these stages, an individual can relapse at any stage, and can cycle backwards and forwards through the stages multiple times, sometimes skipping stages completely. The model is also known as the Stages of Change Model.

1 Introduction

1.1 Background

In the UK transport accounts for around a quarter of domestic greenhouse gas emissions. Since 1990, emissions from the UK's transport sector have increased by 12%, to 131 million tonnes of carbon dioxide in 2006. However, given the current set of policy measures, the Government anticipates that transport emissions will level out by 2020, and then possibly begin to fall despite continuing or rising demand for transport. Much of the abatement will come from the road transport sector, where emissions are projected to be about 28 million tonnes of CO_2 lower in 2020 than they would have been in the absence of policy measures. This reduction will reflect further improvements in vehicle fuel economy and the adoption of policies which, when combined, are expected to more than offset the CO_2 impacts of continued traffic growth.

Since its publication in October 2006 the Stern review has moved the international debate on climate change further (Stern et al., 2006). Its three-legged policy framework is a useful way of presenting and understanding the Government's policies on transport emissions (e.g. DTI, 2007). Transport policies on tackling climate change are often presented according to this framework, for example:

- carbon pricing through tax, trading or regulation, for example including aviation in the EU emission trading scheme (ETS);
- technology development, such as the Low Carbon Transport Innovation Strategy (LCTIS) and the King Review of low-carbon cars (HM Treasury, 2007 & 2008); and
- behavioural change, including a variety of Government actions, for instance public transport investment, Smarter Choices[1], information and communication campaigns, such as the ACT ON CO2[2] campaign and social research.

DfT has a considerable amount of data on people's travel patterns from sources including the National Travel Survey (NTS). There is a wealth of Government and academic research on attitudes to climate change and transport behaviour which has been clearly and comprehensively reviewed in Anable et al (2006). Their research shows that whilst the concept of climate change is well recognised across a broad spectrum of the population, understanding of the science and implications of climate change is very mixed. Furthermore, little is known about the reliance people place on different sources of information on climate change or how they respond to them.

Where attitudes suggest that climate change is an accepted problem and even when stated willingness to act is high, behaviour change does not necessarily follow. Anable et al. (2006) highlighted the dearth of evidence that previously existed on the barriers to travel behaviour change underlying this issue – widely reported as the 'attitude-behaviour' or 'value-action' gap.

[1] See http://www.dft.gov.uk/pgr/sustainable/smarterchoices/campaign
[2] See: http://actonco2.direct.gov.uk/index.html

Many potential attitudinal issues have been suggested as contributing to, or increasing, the extent of the gap. For example, it has been suggested that uncertainty about the extent of the impacts of climate change, the timescales over which they might occur and the location of the worst impacts, may mean that environmental concerns alone are unlikely to motivate actual behaviour change (Richardson et al., 2007). Even where the importance of climate change is viewed as high it may be that individuals view their own role as making a negligible difference. Coulter et al (2008) also highlighted the strong links between lifestyle and travel behaviour that may further limit the likelihood of travel behaviour change in particular.

Anable et al. (2006) concluded that a deeper understanding of the role of individual and societal motivations and barriers to reducing car use needs to be established for a range of travel behaviours. It was also concluded that the evidence base points to segmentation of the population as likely to be more effective in developing travel behaviour-change programmes than treating the whole population as an average consumer. It further identifies limitations with traditional approaches to segmentation such as age or income, for example, which do not consider the motivation for change of any segment. It suggests that different types of travellers will be inhibited from changing their travel patterns by different barriers. Understanding the precursors to changing travel behaviour and how these vary across different segments of the population was identified as another research gap.

Even if there is no direct link between awareness of climate change issues and behaviour change, there is still a role for improved information in making other policy measures more acceptable and rational. The current research also therefore explores issues of segmentation, information provision and policy preferences amongst the public[3].

1.2 Aims and objectives

The over-arching aim for this project was to explore the link between information and public understanding of climate change, attitudes towards climate change and travel behaviour. If such links exist, subsequent goals were to identify which pieces of information are most pertinent in changing travel-related behaviour, and whether different messages impact differently on different sections of the population, and if so how.

The current research project had three broad objectives:

1) to explore public understanding of, and engagement with, climate change;
2) to identify and explore the barriers and incentives to behavioural change which could result in reduced impact of personal travel behaviour on climate change; and
3) to explore the role of information (especially scientific information) in improving public awareness, understanding of, and attitudes towards, travel behaviour and climate change and its potential for influencing behavioural change.

[3] In January 2008 Defra published *"A framework for pro-environmental behaviours"* which segments the UK population into seven groups with respect to attitudes to the environment and willingness and ability to act. However, the read-across to transport issues requires further elaboration.

Importantly, as targeted strategies of behaviour change are acknowledged to be more effective than a 'one size fits all' approach, DfT was keen to understand how best to approach future market segmentation exercises. This required a research approach which combined typical socio-demographic variables with information about motivations and attitudes to look for more behaviourally relevant contrasts between groups.

1.3 Report structure

The following chapter provides an overview of the research design, providing details of the sampling method and the data collection tools. For a more detailed discussion of the methodology, see the Technical Report.

Chapter 3 explores awareness, acceptance and understanding of climate change and how this changed during the project.

Chapter 4 addresses participants' expressed willingness to change and the reported behaviour changes that occurred. The chapter also seeks to explain the link between reported changes and attitudes using the Theory of Planned Behaviour and Stages of Change models.

Chapter 5 provides an overview of what influences travel behaviour.

Chapter 6 describes the motivators and barriers to behaviour change with respect to specific travel-related behaviours that would reduce carbon consumption.

Chapter 7 revisits the data from the perspective of the impact on behaviour of the information imparted during the meetings and taking part in the project more generally.

Drawing on the findings from all the data sources, chapter 8 provides conclusions in relation to each of the objectives set out above, as well as drawing some more general conclusions.

At the end of each chapter we draw out some implications for policy and communications messages that might encourage behaviour change.

2 Research Design

2.1 Introduction

Members of the public were recruited in five separate locations to take part in five meetings which were held in their local area. In each location the five meetings, which incorporated focus group discussions and deliberative techniques, took place over almost a year[4]. During the fieldwork period participants were also asked to complete travel diaries and psychographic questionnaires. About five months after the last meeting a sub-group of participants was interviewed by telephone (see section 2.3 for a fuller description of the methods used). Participants from the five groups never met each other.

2.2 Sample

In all, 141 participants were recruited to 'represent' five different groups distinguished by income and lifestage as NTS data shows that lifestage and income impact on travel-related carbon consumption (DfT, 2001). This grouping was intended to allow us to determine what sort of information and interventions had most impact on understanding, attitudes and behaviour and whether these differed by grouping. Table 2.1 below provides descriptive profiles of each of the five groups and their location.

Locations were determined by:

- the need to have the locations geographically spread throughout England;
- the density of the lifestage and income group in an area;
- elimination of areas where there were known local issues that may impact on public views relevant to the research topic, for example, sustainable travel town areas, cycling demonstration towns, airport related planning issues; and
- removal of areas where there was current/planned DfT-funded research taking place so that DfT would not over-research a particular location.

2.2.1 Participants

Individuals were recruited in February and May 2007[5] to 'represent' their household and were therefore recruited on the basis of the occupation of the chief income earner in the household, with the exception of the Younger People, who were recruited individually. Hence within each group there is a mixture of occupation levels.

[4] The groups met to slightly different timetables because of local authority elections in May 2007.
[5] Respondents were recruited by the subcontractor Plus Four Ltd.

Table 2.1 Lifestage group profiles (See Glossary of terms)

Group	Location	Age	Social grade	Level of carbon dioxide emissions	Where participants lived	Other features
Educated Professionals	Reading	45 and over	AB (some retired)	11.7 kg per person per week on average. Highest of all groups, high relative to GB average	Reading and surrounding rural locations	Many of this group had children, some of whom lived independently
Middle Class Families	Leicester	30-44	ABC1	11.3 kg per person per week on average. Second highest of all groups, above GB average	Mix of suburban and rural	Many had school-age children living at home
Younger People	Leeds	20-29	Mixture	3.9 kg per person per week on average. Lowest of all groups, recruited to be average for the UK but were actually well below average	Most lived in the outer suburbs of the city	A few had young children, some lived with parents, others lived alone or with partners. Some worked but others were in full-time education
Less Affluent Mature Families	Plymouth	45-64	C1C2 (some retired)	8.7 kg per person per week on average. Lower than GB average	Drawn from communities surrounding Plymouth	Many of this group had children, some of whom lived independently
Less Affluent Younger Families	Liverpool	30-44	C1C2D	4.5 kg per person per week on average. Second lowest of all groups, below GB average	Based in Liverpool conurbation	Tended to have younger children living with them

We excluded from this research the lowest carbon users because they tend to be low income groups living in inner city areas who currently travel small distances and already rely on walking and public transport. We also excluded those living in very rural areas, who have few transport options.

2.3 Data collection methods

Data was collected from six sources during the project:

- recruitment questionnaires;
- deliberative events;
- psychographic questionnaires;
- travel diaries;
- evaluation forms; and
- telephone follow-up interviews.

2.3.1 Recruitment questionnaires

At the point of recruitment, information on socio-economics, car ownership and travel to work patterns was collected to ensure that those recruited to each of the five groups met the required profile. Additionally, some data on attitudes to environmental issues was recorded, partly to ensure a spread of attitudes in each group and partly to enable changes to be analysed.

2.3.2 Deliberative events

The deliberative events formed the primary component of the fieldwork and data collection.

Deliberative research methods involve the provision of information for deliberation by participants within the fieldwork process. These methods are particularly useful for researching views on topics about which the public are unlikely to have much knowledge and/or topics likely to generate a 'knee jerk' response rather than one that demonstrates a more rounded appreciation of diverse issues relating to the topic being discussed. On this basis, the use of deliberative methods enables researchers to gain an insight into existing public attitudes, views and opinions through initial discussions using a focus group approach before introducing information to the group of citizens, usually by inviting experts to meet and debate with the citizens in direct dialogue.

Within the deliberative process, time is allowed for the citizens to deliberate among themselves, to reflect and meet again for further deliberation. It is this process of the provision of information, deliberation, reflection and debate that enables citizens to develop their opinions and reveal more considered views and values, whilst allowing the research to explore in more detail those factors underlying them.

The findings of deliberative research exercises, if they are to add to the understanding of public perspectives, need to be carefully interpreted, for example, taking on board the influence on the participants of the presenters as well as of the information presented.

Deliberative methods can be participatory, that is they can allow participants a degree of control over the process by, for example, allowing them to select experts to present information, but they do not need to be. The project reported here was only participatory in that the participants had some control over the nature of the information they received. The participants had no other input into the nature and content of the meetings.

The deliberative events provided us with rich data that enabled us to understand the motivation for change and the barriers, both attitudinal and practical, to changing behaviour. They also enabled us to record types of travel-related behaviour change which were not covered by the travel diary. These included measures such as home shopping, buying more local produce and 'smarter driving' behaviours, for example, regularly checking car tyre pressures.

The first three meetings in each location were held close together between March and June 2007[6] to enable the participants to get to know each other and the subject area and reflect on the information they received. The other two meetings allowed for longer term

[6] The Educated Professionals group's meeting schedule was run slightly ahead of the other groups to allow piloting of the method and materials.

reflection and gave respondents the chance to reflect on the information and discussion in the context of their day-to-day lives. Each meeting is briefly described below.

Meeting one
Evening event (3 hours) held in March and May/June 2007.

Aim: To provide a sense of the baseline views of participants and to identify information needs; it also allowed the research team to introduce themselves and the project to the participants.

Content: Before any information about the project topic was introduced, participants broke into smaller groups to discuss:

- awareness and understanding of climate change;
- acceptance of climate change and the impact of human activities on climate change;
- the amelioration of climate change;
- transport and climate change;
- barriers and incentives to travel behaviour change; and
- sources of information on climate change.

After this discussion, and before any information was imparted, participants completed the initial questionnaire (see section 2.3.3 for more details)**.**

After a short break, participants were given an introductory presentation on the topic of travel and climate change and identified the topics about which they would like further information from experts.

Participants completed a seven day travel diary before attending the meeting.

Meeting two
Saturday event (5 hours), about ten days after the first meeting.

Aim: To provide information to address the identified information needs via expert presentations and to allow participants to deliberate between themselves and with the experts.

Content: In response to the questions identified at the first set of meetings, the experts presented information on:

- the science of climate change;
- technological solutions in development with respect to transportation;
- transport policies in towns and cities around the world that address climate change and support changes in travel behaviour; and
- UK policy on transport and climate change.

Meeting three
Evening event (2.5 hours) about four days after meeting two.

Aim: To enable further deliberation of information and to provide information on possible personal actions.

Content: Participants were given a presentation by an expert on actions individuals could take to reduce their travel-related carbon consumption. (See Technical Report Volume III for all presentations given during the meeting.) Participants were given feedback from their first travel diary showing number of trips, purpose of trips, distances travelled and carbon consumed. Participants discussed the information received from all the presentations and the travel diary. At the end of the meeting participants completed a short evaluation form anonymously.

After the meeting participants completed a second seven day travel diary.

Meeting four
Evening event (3 hours) about three months after meeting 3. All were held September/October 2007.

Aim: To find out whether participants had made changes to their travel behaviour and why/why not and how information on individual CO_2 emissions impacted on these changes, if at all.

Content: Participants discussed changes in travel behaviour and barriers and incentives to behaviour change in breakout groups.

Immediately before the meeting participants completed a third seven day travel diary.

Meeting five
Saturday event (5 hours), January/February 2008.

Aim: To explore why participants made certain travel choices and not others and the role carbon emissions played in their decision-making.

Content: This meeting considered barriers and motivators to particular transport behaviours. At the start of the meeting participants completed the final questionnaire (see section 2.3.3 for more details).

Immediately before this meeting participants completed their fourth seven day travel diary.

At the end of this event participants completed a named evaluation form.

2.3.3 Psychographic questionnaire

During the first meeting participants completed an initial questionnaire and at the start of the last meeting they completed a final questionnaire. Both questionnaires explored participants' understanding of climate change, their intention to change their behaviour, and where they had heard about climate change. Psychographic variables (such as attitudes towards reducing car use, feelings of moral obligation and responsibility to act and the influence of significant others) were also recorded along with socio-demographic data. The purpose of these questionnaires was to explore individuals' beliefs regarding climate change, and to use the data to understand intentions and behaviour regarding car use in the context of climate change. Modelling based on the Theory of Planned Behaviour and the Stages of Change model (see glossary of terms) was used to analyse this data.

2.3.4 Travel diary

The participants completed four travel diaries spread across the course of the project, covering different seasons, each of which tracked travel behaviour across a period of one week. The entry diary was completed before the first meeting; the exit diary before the last meeting. Participants documented all trips made, how they were made and for what purpose and this provided a rich and valuable dataset against which to understand what types of behaviour change reportedly occurred and in which contexts. Indicative changes in carbon consumption were also produced using the travel diary data (see Technical Report Volume II for details). Travel diaries cannot capture every detail of behaviour change however, such as changes in driving style. These limitations are discussed further in chapter 4, where estimates of changes in travel behaviour are given.

2.3.5 Evaluation form

At the end of the third and fifth meetings participants completed evaluation forms to provide feedback on the research process and enable some comparison of attitudes to climate change against data collected at recruitment.

2.3.6 Telephone follow-up interviews

Towards the end of the main fieldwork period it became clear that further exploration would enable a deeper understanding of individual motivations, intentions and abilities to change. Follow-up telephone interviews were conducted with 25 participants five months after the last meeting. Interviewees were sampled based on their responses to the psychographic questionnaire and travel diary records and comprised:

- those whose carbon dioxide emissions increased between the first and the last travel diaries but who had expressed the intention to reduce their carbon dioxide emissions in their initial questionnaires;
- those whose carbon dioxide emissions reduced between the first and the last travel diaries and who had expressed the intention to reduce their carbon dioxide emissions in their initial questionnaires; and
- those whose carbon dioxide emissions reduced between the first and the last travel diaries but who had not expressed an intention to reduce their carbon dioxide emissions in their initial questionnaires.

2.4 Completion of tasks

Not all participants completed all tasks. Table 2.2 shows how many completed each task.

Table 2.2 Participation

Task	Number of participants
Meeting 1	141
Travel Diary 1	140
Meeting 2	129
Meeting 3	130
Travel Diary 2	112[7].
Travel Diary 3	120
Meeting 4	119
Meeting 5	114
Travel Diary 4	119
Completed both questionnaires	114
Completed all Travel Diaries	106
Took part in all meetings	109
Completed all tasks	97
Completed a follow-up telephone interview	25

Of the 141 participants who attended the first meeting there are 111 for whom we have both the entry and exit travel diaries and two valid questionnaires. The numerical data presented in the report that draws on either of these two sources relates only to these 111 individuals. This is because:

- it enables a more consistent picture to be drawn;
- a significant component of the analysis uses the questionnaires to explain variability in travel diaries;
- though an important part of the research design, the sample size was always too small to allow a fully representative quantitative investigation; and because of this
- the nature of this investigation, and use of the travel diaries, is exploratory.

Ninety-one of the 111 individuals for whom data is presented were frequent drivers (using a car more than once per week). Some questions, for example about intentions to reduce car use, can only be asked of this group and this is indicated where relevant in the report.

Data from the discussions is reported for all those who took part in each meeting. The data from the evaluation forms is presented for all those who completed each form. The data from the telephone follow-up interviews is used to enhance the deliberative data.

Most of the attrition was from the Younger People group. Other drop-out was circumstantial, related to individual holidays, illness, etc. Technical Report Volume I details the incentive scheme and administrative practices used to maintain participation.

[7] Travel diary two was completed at the time of a national postal strike and some went missing.

3 Attitudes to Climate Change

3.1 Introduction

This chapter explores public understanding of, engagement with, and attitudes towards, climate change and how they changed over the course of the study. Each section within the chapter uses data from the recruitment questionnaires, the first three meetings and the initial psychographic questionnaire to set out participants' views at the beginning of the study and draws on data from later in the project to examine how views changed.

Key Findings:

- Climate change was seen as an important and serious issue.
- Awareness of climate change was universal.
- Acceptance of climate change was almost universal.
- Fewer participants accepted that climate change is the result of human activity, although this increased over the course of the project.
- Half the participants accepted that they personally contributed to climate change and this did not change over the course of the project.
- The causes of climate change and the role of human activity in contributing to climate change were poorly understood and this may act as a barrier to changing behaviour.
- Initially women were more concerned about climate change than men, but during the project men became equally concerned as a result of the information provided**.**
- The impact of climate change was seen to be greater outside the UK.
- There was a failure to take on board the relatively short timescale over which climate change is happening.
- Some people may be motivated to make changes to reduce their emissions by factors such as cost savings, even if they do not believe climate change is caused by human activity.

3.2 Awareness and acceptance of climate change

3.2.1 Environmental issues and the importance of climate change

At recruitment participants were asked which of a series of statements best described their personal view on the environment. The responses are summarised in table 3.1.

Table 3.1 Attitudes towards protecting the environment

	Number of responses
I am very concerned about protecting the environment and do everything I can to help	19
I am concerned about protecting the environment but know there is more I can do	33
I am quite concerned about the environment and try to take environmentally friendly actions when I can	71
I realise protecting the environment is important but I do not feel there is much I can do about it	11
I think there is too much fuss made about environmental issues and I don't believe that anything I do will make a difference	5
The environment isn't my responsibility	0

Base: All those who took part in the first meeting, except for two who did not answer the questions, 139

We did not explore the importance of environmental issues relative to other issues but *"Social Trends"* (ONS, 2008) shows that 48% of people disagreed that the environment was a low priority to them compared to other things in their life. Additionally, a DfT survey found that around 9% of adults thought that climate change was the most important issue relative to all other issues (crime, health, etc.) and this issue has risen in importance since 2006 so that 29% saw climate change as one of the top three issues facing the country (DfT, 2008).

We did, however, explore which environmental issues were at the forefront of participants' minds at the beginning of the first meeting. The majority of the environmental issues of which participants were most aware were linked to climate change. Indeed climate change, or *"global warming"*, as it was more usually termed, was the environmental topic ranked most important by the majority of participants in all groups. Other environmental topics mentioned included recycling, waste disposal, use of fossil fuels and pollution. Moreover, some in the Middle Class Families and the Less Affluent Mature Families groups spontaneously suggested that climate change was related to all the environmental issues mentioned.

After this preliminary discussion, participants completed the initial questionnaire. **Based on the 111 participants** who completed all four travel diaries and both the initial and final questionnaires, **98 respondents felt climate change was important whilst seven disagreed**. There was no significant variation in the strength of opinion across the different groups or between frequent and infrequent car drivers.

The questionnaire also asked participants to rank how serious a problem they felt climate change to be. Only **eight out of 109 respondents initially tended to *disagree* that climate change is a serious problem (decreasing to five by the final questionnaire)**. **Women reported slightly stronger beliefs than men that climate change is a serious problem** and that it is having severe impacts on the UK climate.

Women were also generally more concerned than men about climate change at the outset. However, while women's views did not change over the period of the project, the questionnaire findings show that **men's views shifted significantly towards being more accepting of, and concerned about, climate change**.

Being involved in the project has influenced the views of participants. Some participants felt that climate change must be an important issue because the DfT had gone to so much effort to understand attitudes towards it. Whereas, for others, raised awareness and the chance to deliberate with others made them think more about the issue. **At the end of the third and final meetings** participants completed an evaluation form. This showed that **the majority of participants said that they were more concerned about climate change** at the end of the third meeting **than they were at the start of the project**, and this remained the case at the end of the project. **The predominant reason for the increased concern about climate change was a greater belief in the phenomenon**, **following the scientific presentation.** Moreover, participants in all lifestage groups were explicitly aware that this is what had influenced them most strongly. The impact of personal presentation of the information, rather than through the media is discussed in chapter 7.

3.2.2 Awareness of climate change

The preliminary discussions revealed that all of the participants were aware of the concept of climate change. Analysis of the initial questionnaires shows that almost all participants had engaged with the subject of climate change at some level; 123[8] replied that they had 'read about, watched or listened to a TV or radio programme about, thought about or discussed climate change'. Indeed the responses to the initial questionnaire about sources of information reveal very diverse sources, (see section 7.2) reflecting the topicality of the issue and its widespread coverage in the media in the early part of 2007.

By the last meeting, the majority of participants in all groups reported that a major impact of taking part in the project was feeling more informed, rather than just more aware. This is important in that **taking part had not only raised awareness but had increased understanding** of the issue and therefore **in some cases willingness to engage**. For some of the Younger People, information in the media now made a bigger impact than it had done before because taking part in the study made the issue and the information *"more real"* for them.

While some people simply felt they were more aware of the problem and had a better understanding of the issue, others felt that this increased awareness had encouraged them to think about their travel behaviour but not act. However, almost all discussed changes which they had been willing to try.

> *"The fact that we're aware of it has influenced our behaviour."*
> Educated Professionals, male (meeting 5)

The relationship between awareness and behaviour is discussed in detail in chapter 4.

A number of participants expressed the view that while their awareness had been raised and was impacting on their thinking and for some, on their behaviour, engaging the wider population would be very difficult. Those who had tried to engage friends had found this to be the case. Some commented that friends were interested in climate change but discussions had not led friends to change their behaviour because they either did not see it as a priority, did not think they could make a difference or had not had the information to fully understand the issues. Others reported that friends were not interested at all; this was generally because they did not believe climate change was happening (for example some had been influenced by the Channel Four documentary The Great Global Warming Swindle).

> "*I have tried to go with them* [friends] *in the car or them come with me, rather than before maybe I would've said I'll meet you there. I'm more aware of maybe just using the one car now instead of two or three. So has that rubbed off on my friends? I don't really know."*
> Less Affluent Younger Families, female (follow-up telephone interview)

Engaging other people in their household appears to have been slightly easier. Some participants reported that their children were the ones driving behaviour change based on influences from schools.

[8] Of 131 respondents completing the study who answered this question.

"With the environment being talked about, we do think about it more. My children are being walked to school and they get a badge for walking to school. They say, 'Mum, we can't take the car, we've got to walk' [so that they can get the badges]."
Less Affluent Mature Families, female (meeting 1)

3.2.3 Acceptance of climate change

The initial questionnaires found that **acceptance that climate change is happening was virtually universal**. At the outset of the study only four participants, who were spread across the groups, did not believe that climate change is happening. There is no defining common feature amongst these participants.

The discussions also revealed that **participants felt that their own experiences of local weather conditions validated scientific claims that the climate is changing**. For example, the following observations were made:

"We're getting different plants that are growing in different places, it's warmer…They're flowering earlier…it's changing the cycles."
Younger People, female (meeting 1)

"I work outside and winter's nowhere near as cold as it were when I first started work…you don't get frosts like you used to."
Middle Class Families, male (meeting 1)

Milder winters were mentioned by a number of participants and seemed to be a defining feature of climate change in the participants' minds. Acceptance that climate change is happening remained high throughout the project.

As well as being asked whether they believed that climate change was happening, participants were also asked how *certain* they were that climate change was happening. The level of certainty increased between the initial and final questionnaires. This was due to the information provided and the discussions it provoked.

3.3 Understanding of climate change

3.3.1 Science and the causes of climate change

While participants were aware of the concept of climate change initially, and most generally accepted that it is happening, their understanding of the causes was very confused. The **most common misconception**, which emerged in all the groups, was that **the hole in the ozone layer is a cause of, a result of, or related to, climate change**. Some participants believed that the hole in the ozone layer lets the sun's rays through and makes it hotter, causing problems such as increased skin cancer. This is an **important** issue as it means that understanding of the causes of climate change was limited, and **that the role of human activity and personal contributions to climate change were not well understood and the need for behaviour change to reduce CO_2 emissions therefore ignored**. This is especially true given that participants knew that the hole in the ozone layer is repairing without them feeling they had taken individual action.

Greenhouse gasses were also mentioned as a cause in all the groups but the discussions revealed that **generally participants did not know what greenhouse gases are or how or why they have an impact on the climate**.

3.3.2 Human activity and the causes of climate change

The questionnaire suggested that around three quarters of participants initially believed that climate change is the result of human activity to some degree. However, **the discussions revealed scepticism and uncertainty about whether or not climate change is the result of human activity**. In all groups there were a few individuals who demonstrated that they were sceptical that human activity was a contributor to climate change, although some, but by no means all, were reluctant to be too vocal because of the predominant view in all the lifestage groups that human activity played some role. The main reasons for the scepticism were:

- a belief that scientists do not agree on the causes of climate change and whether it was a result of human activity;
- a belief that the idea had been invented by Government as a way to raise taxes;
- a belief that the seriousness of the issue is being overstated – comparisons were made with how the hole in the ozone layer had "*repaired itself*" and the Y2K bug that had never materialised; and
- a belief that climate change is solely the natural cycle of the earth.

These beliefs were underpinned by a perception that statistics can be manipulated. Section 7.6 describes how the information provided impacted on these sceptical beliefs.

The initial and final questionnaires explored the degree to which participants felt different forms of human activity – transport, industry, housing and farming – contribute to climate change. Participants were asked to score a number of human activities on a scale of one to seven reflecting the extent to which they thought each was making climate change worse. On the scale, the instructions stated that one represented 'made worse', while seven represented 'not made worse'. Table 3.2 below shows the average score for each activity about which participants were asked and the initial and final ranking of importance of each source of emissions.

Table 3.2 Relative importance of different contributors to climate change

	Average score (rank) Initial	Average score (rank) Final	Change in rank
Emissions from industry	2.1 (1)	1.9 (1=)	~
Aircraft emissions	2.4 (2=)	1.9 (1=)	+1
Lorry emissions	2.4 (2=)	2.4 (4)	-2
Car emissions	2.6 (4)	2.2 (3)	+1
Bus emissions	3.1 (5)	2.9 (6)	-1
Emissions from homes	3.2 (6)	2.7 (5)	+1
Emissions from trains	3.6 (7)	3.6 (7=)	~
Motorcycle emissions	3.8 (8)	3.6 (7=)	+1
Farming	4.6 (9)	4.0 (9)	~

Base: All with full records, 111

Table 3.2 shows that **participants believed that all these human activities are making some contribution to climate change, except farming**. This may be due to the idealised view that many people have of farming or that they were not aware of the link between it and the production of greenhouse gases. Farming is not therefore associated with pollution. Moreover, there is also a perception that trees and plants absorb CO_2 thus growing these is seen as a good response to climate change.

Table 3.2 also shows that some **misconceptions about the relative importance of different sources of emissions** exist with, for example, emissions from homes being low on the list and those from lorries being high (whereas lorries contribute only around one quarter as much CO_2 as residential usage in the UK). There is no evidence that participants underestimated contributors relating to their own emissions, such as car emissions and emissions from the home deliberately. In general, this hierarchy reflects emissions that can be seen and smelt – lorry exhaust looks dirty and smells, but emissions from homes are often invisible and odourless.

It can be seen that on average, **participants believed that industrial emissions were the biggest exacerbating factor**. The importance attached to different contributors to climate change is likely to be important to individuals in framing their personal response.

> *"Whatever we do, industry does their own thing anyway for profit. I think they could wipe out what people do as an individual."*
> Middle Class Families, male (meeting 3)

The perceived role of industry was reflected in the discussions where the rapid industrialisation of China and India was cited as having major impacts on climate change. **Some were sympathetic to economic development** in these (and other) countries and appreciated that developing countries want to achieve the same standard of living as the UK. **Others believed that there was no rationale for the UK to take action if others would not** do so, whether this was the USA or China. Moreover, they **questioned the effectiveness of UK-wide action**.

> *"We're a very small country to be making a difference if nobody else is doing something."*
> Less Affluent Mature Families, female (meeting 3)

Others felt, however that the UK should set an example to other countries or not use other countries as an excuse not to act.

> *"I don't think as a nation that we should just bury our heads in the sand and say 'well, if they're not doing it neither will we'."*
> Less Affluent Mature Families, male (meeting 3)

Participants were aware that domestic vehicles had different levels of emissions from their experience of paying vehicle excise duty and the emission tests performed for MOTs. This was not perceived as useful, or usable, information by a number of participants, unless they were changing their vehicle, in which case it was one factor among many. Importantly, a majority of participants in the group were buying second-hand cars. The importance of the second-hand market is highlighted in the House of Commons Environmental Audit Committee report (House of Commons, 2008) on vehicle

excise duty which states that about 2.2 million new cars are purchased each year, compared to 7.6 million second-hand cars. **Only a very few male participants** (but no females) **explicitly linked lower emissions with greater fuel efficiency and thereby with cost savings.** Once this issue was explained, the concept appeared obvious to all participants. Participants who initially recorded below average carbon use had significantly stronger beliefs that cars contributed to climate change than those with above average carbon use. By the end of the project, the contribution from cars was seen as more important than at the beginning, across the whole sample.

Participants were often unsure which form of transport was 'better' in terms of emissions, especially where public transport occupancy is low.

All groups assumed that flights impacted considerably more on climate change than cars but most were unaware of the magnitude of the difference until they received their travel diary feedback at the third meeting.

> *"I've just noticed the air travel, and my average weekly consumption last year was 18.27 kilograms and my car use was, or other transport use, was 8.6. I think I took two flights last year and one of them was to go to Barcelona for the day, and it cost me £36…but I feel absolutely terrible now."*
> Less Affluent Younger Families, male (meeting 3)

Whilst all socio-economic groups agreed initially that climate change is caused by human behaviour, those in the highest groups (AB) were significantly more convinced that this was true than those classified as social grade C1. Those in the AB socio-economic groups also agreed more strongly that this was the case by the end of the study.

Table 3.2 also shows that during the course of the project, participants' views on the relative contribution to climate change of different sources of carbon dioxide emissions changed. In particular, they saw emissions from cars and planes as more important by the end of the project than they had at the beginning.

The responses to the final questionnaire show that there continued to be a significant tendency to agree that climate change is a serious problem, that human activity is contributing to it, that for many it is a threat to their quality of life but a greater threat to their children and grandchildren. It is the significant shift in the proportion of men agreeing that climate change is caused by human behaviour and that the problem is serious, which has increased the overall level of concern. By the end of the project there were no differences in attitudes between females and males reported in the questionnaires.

3.3.3 Personal contribution and causes of climate change

In general, participants were unaware of the extent of their personal contribution to climate change from their own travel. At the end of the project 56 out of 110 respondents agreed that their personal contribution made climate change worse which is up only slightly on the 53 (out of 109) at the start, although the strength of agreement had increased amongst some participants. Taken with the other findings, this suggests that **even though the public might accept the human contribution to climate change, it cannot be assumed that this will lead to an acceptance that *personal* actions will make a difference**.

The questionnaires show that, on average, **20-29 year olds differed from other groups in that they were more likely to disagree at the end of the project that climate change is made worse by their personal contribution** than those aged 45 and over. The discussions revealed that the Younger People generally had a correct perception that they had lower carbon lifestyles compared to the national average and so were less inclined to think that their personal contribution was significant.

Those in higher socio-economic groups (ABC1) continued to be significantly more certain that they personally contributed towards climate change than those in lower socio-economic groups (C2D). This could be due to ABC1 participants' greater belief that humans contribute to climate change more generally or to an understanding that better off social groups consume more carbon than less well off social groups.

Reactions to the feedback from the first travel diary also demonstrated participants' lack of awareness of their personal contribution. The feedback revealed the level of carbon used by different transport modes and **participants were surprised by their overall level of carbon dioxide emissions**. It is not clear why participants were surprised as none had any points of reference prior to involvement in the project and the **absolute measures of carbon used in and of themselves had little meaning**. This supports the findings of other recently completed work looking at the use of carbon calculators (Coulter et al., 2007). However, it was the relative carbon consumption of the different modes and between individuals that participants found interesting. The process of comparing similar activities such as commuting to work with each other and seeing how travelling by different modes made a difference to carbon consumption was something that participants could grasp.

With respect to non-transport emissions, participants had a very general understanding that they should turn off lights when not needed, not leave appliances on stand-by and recycle wherever possible. They had no understanding of the scale of the impact of these actions beyond mentioning information imparted in television advertisements, which were not related to transport emissions. However, **there was a much greater stated willingness to make changes in their domestic use of energy** and to insulate their homes **than to make changes to travel patterns**. It was perceived as simple and far less inconvenient to make changes domestically than to change travel patterns as changes at home could be made easily without having to make any major changes to lifestyle, for example changing light bulbs and using low energy washing cycles. This reflects the findings in *"Social Trends"* which shows that more people are engaging in environmentally friendly behaviours related to changes in the home, such as recycling, wasting less food and using less gas and electricity, than are engaging in transport related changes such as using a car less and flying less (ONS, 2008).

Both those who believed that climate change was happening and was the result of human activity and those who believed that while it might be happening, it was not caused by human activity, understood that taking action would have other benefits, such as better air quality and less congestion and was therefore worthwhile.

3.3.4 Perceived impact of climate change

The **main beneficial impacts of climate change for the UK were seen to be better summers and milder winters** and these tended to be the first things mentioned by participants. These were seen as beneficial because it would enable a better quality of life, fewer people travelling abroad for holidays, less energy being used for heating, fewer people dying in the winter and the UK being able to grow crops that currently cannot be grown here, grapes for wine making were given as an example.

There was some nostalgia for snow in the winter but the **main negative impact of climate change mentioned was the impact on health**. For example, increases in the occurrence of illnesses such as skin cancer, hay fever and asthma[9] as well as viruses, were thought to be affected by the change in climate and increasing levels of pollution. The spread of diseases was also mentioned as a result of changes in the insect population and various 'bugs' that were not killed off in milder winters. There was also an appreciation of the impact on the weather more widely, lower rain fall and 'extreme weather' were mentioned, especially flooding[10]. All groups gave examples of these types of negative impacts and all were very UK focused. While a lot of discussion was focused on the impact on the UK, some participants did mention impacts on other countries such as crops failing in Africa, floods in Asia and increased frequency of global disasters such as tsunamis and tornados.

Despite the many negative impacts that were mentioned, **climate change was not seen as a day-to-day issue for people living in Britain**; participants thought that other countries would be more affected.

> *"I think it's quite difficult because the UK doesn't seem to have most of those disasters…they're not central to our lives, it's news. It's difficult to accept that climate change is something that's affecting you."*
> Younger People, female (meeting 1)

This is supported by responses to the initial questionnaire which showed that **participants believed that the impact of climate change on the UK will be lower than its impact on the world climate**. This belief remained throughout the project and was true across all of the five lifestage groups, although a couple of participants were concerned that because Great Britain is an island, it might be more at risk from a rise in sea level.

Respondents from wealthier socio-economic groups tended to report stronger agreement that climate change was a threat both to the UK and elsewhere than those from lower socio-economic groups. Many of the participants (frequent drivers, males, over 45s and those in A, B, C2 and D socio-economic groups) became more concerned with the impact of climate change on the UK over the life of the project. In general, the Educated Professionals took a broader world view at the outset and were more able to look at the problem from a number of perspectives as well as their own. For example, they were

[9] People with asthma can be affected by different climatic conditions, although the precise reactions to different climates varies between sufferers.
[10] This was discussed at the meetings that *preceded* the widespread flooding in the UK in the summer of 2007.

more likely to express an understanding of the needs of developing countries, to express concern about the impact on developing countries, and to appreciate the impact the UK can have as a leader in policy change. Moreover, Educated Professionals was the only lifestage group to become statistically more concerned about the impacts of climate change on the world environment.

The **lack of perceived impact on participants' day-to-day lives may limit the extent to which awareness and understanding of climate change can motivate behavioural change at the individual level**. Cost, convenience and health are the factors that are most likely to impact on behaviour. This emerges from the discussions but also from responses to other questions in the initial questionnaire; additionally a DFT survey found that only about a third of adults thought that climate change would impact on them individually, with nine out of ten believing climate change would impact on future generations a 'great deal' or 'a lot' (DFT, 2008). Likewise, in this study, participants tended to agree that climate change is a threat to their quality of life but saw it as more of a threat to their children and grandchildren's quality of life in the future. Those with children under 18 living at home reported a statistically significantly higher level of agreement that climate change would affect the quality of life of their children and grandchildren, compared to those with older children or no children. This reflects the focus on the future in the discussions, where participants talk about climate change as a more important issue *"for the future"*.

> *"…I just feel, the way people feel is, 'I'm not gonna be around in 60 years so what should I care?'"*
> Less Affluent Younger Families, male (meeting 1)

> *"It's* [reducing emissions] *something that I feel morally that perhaps I should do, but it's not particularly important to me, I have no children, I have no reason therefore to worry too much about any effects of the future on my children…It is really not greatly important to me, other than maybe the world keeps going until I'm out of it."*
> Educated Professionals, male (follow-up telephone interview)

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Differences exist in the perception of the impact of climate change on respondents' personal quality of life with **those in socio-economic groups A and B reporting being more concerned than those from the socio-economic groups C2 and D**. The 20-29 year olds also disagreed that climate change is a threat to their quality of life and differed from those aged 30 and over in this regard. **While those aged 30 and over became more convinced of the threat to their quality of life from climate change, 20-29 year olds became less convinced by the end of the project**. The discussions suggest that the Younger People took on board from the science presentation that other parts of the world would be more affected by climate change than the UK and interpreted this to mean that the impact on them personally would be low. Overall, between the two questionnaires, participants became slightly more concerned about the threat from climate change to their quality of life and that of their children and grandchildren.

3.4 Summary and conclusions

Awareness of climate change as an issue was universal and acceptance that the climate is changing was almost universal. Acceptance that human behaviour is a contributor to climate change, whilst not universal, was high. However, there was a lower level of acceptance amongst participants that their personal contribution is significant. Whilst the level of acceptance that human behaviour was a contributor to climate change grew, the acceptance that participants' personal contribution made a difference did not. Hence the **main issue was not acceptance of whether climate change is happening but the extent to which human activity, and in particular individual actions, contribute to these changes.** Where scepticism existed, the 'natural cycle theory' was the alternative explanation most commonly put forward by participants. Conflicting media reports and a perception that the scientific community is not united underlay scepticism and disbelief (see section 7.4). However, participants found the evidence presented in this project that human activity is causing climate change very compelling. This suggests that a key information issue is **making it clear that the significant majority of scientists agree that human activity is driving climate change**. However, there were those who could not be convinced and we return to the implications of this in subsequent chapters.

Participants were aware that modern lifestyles consume carbon, but felt that the amount over which they have immediate control is too small to make a difference to overall emissions. Hence they felt that even if they reduced their emissions as much as possible their contribution would only be a 'drop in the ocean' compared to the emissions of the rest of the world. This suggests that **communications activity needs to demonstrate how individual actions matter**. **Under-29s were less likely to see their personal contribution as making a difference to climate change**. This is supported by the DfT's survey findings that younger people aged 16-24 are less concerned about both the environment and climate change than older age groups (DfT, 2008).

Women were more concerned about climate change than men at the start of the project but **men became equally concerned** as a result of the process of information exchange and deliberation with experts and other participants. Concern at some level is an antecedent to changing behaviour, which means that **men should be the primary target for scientific information about the causes, impacts and timescales of climate change**.

The impact of climate change was perceived to be greater outside the UK. This perception was greater among those in social grades C2 and D, compared with those in social grades A and B, both initially and after the science presentation. The information in that presentation confirmed participants' initial beliefs that the impact would be greater in other parts of the world. The perception that climate change will have little impact on the UK makes it a non-urgent issue for many people, which implies that **it will be important to tie messages about climate change to local impacts.** Those in **higher socio-economic groups tended to be more concerned about the global impacts** of climate change **as well as impacts in the UK,** reflecting a broader world view.

Those aged 45 and over were more concerned about impacts on themselves and also on future generations, particularly those with children and grandchildren. **Under-29s were less likely to see climate change as affecting their quality of life.**

The perception that climate change is an issue for the future, that it will impact on children and grandchildren rather than on adults today **deters people from taking action now to tackle the problem**.

There is a gap between accepting human behaviour as a contributor and accepting personal action as a solution. This appears to be driven by two factors. The first is a disbelief that an individual's action can have and impact on what is a global problem. The second may be a lack of understanding of the relative importance of transport compared to other sectors such as industry and confusion over the relative contribution of different forms of transport.

Even if people accept the human contribution to climate change, and see the scale of the problem, it cannot be assumed that this will lead to an acceptance that personal actions will make a difference.

When informed about different sources of emissions, the contribution from cars was accepted by participants as being more significant to overall emissions than at the beginning of the project. In addition, flying was known to use more carbon than driving but participants were surprised by the extent of the difference.

Both those who believed that climate change was happening and was the result of human activity and those who believed that while it might be happening, it was not caused by human activity, suggested that taking action would have other benefits, such as better air quality and less congestion. This means that **participants may be motivated to make changes to reduce their emissions even if they do not believe climate change is caused by human activity**. It also means that climate change might be an additional motivator to a change that participants might make for other reasons.

Participants were surprised by how much they travelled, and how much their travel contributed to carbon dioxide emissions. **Information about the amount of carbon they used of itself was not meaningful as they had no frame of reference** - participants did not understand what consuming a kilogram of carbon means **- but comparing performance between different transport modes and with other people was seen as useful**. In any wider communications activity a lack of awareness of the level of CO_2 emissions from individual travel is likely to be true for any audiences at whom communication is targeted.

4 Existing, Potential and Actual Low CO_2 Travel Behaviour

4.1 Introduction

This chapter considers transport-related behaviours that participants had already undertaken prior to participation in the study which reduced their carbon consumption. It also explores how willing participants were to make (further) changes to their travel behaviour and what changes they actually considered and made. It draws together the information gathered on knowledge, awareness and attitudes to climate change described in chapter 3, with information on intentions to change behaviour. Critically, the chapter also considers how intention to change relates to reported travel behaviour change using the travel diary data[11]. This helps to close the known gap between stated intentions and behaviours (Anable et al., 2006) and provides an objective basis for understanding the stated motivators and barriers to different behaviours which are presented in chapters 5 and 6.

Key findings:

- The more acceptable behaviour change activities benefit individuals and are perceived by participants as easy to incorporate within their existing lifestyles.
- Personal benefits such as cost and time savings and health improvements were the strongest motivators of change[12].
- Environmental impact was generally of secondary importance in deciding to change behaviour.
- Women were more likely than men to be willing to reduce their car use and to see themselves as able to do so.
- Feelings of personal responsibility to act to reduce car use to tackle climate change and feelings of control over cutting car use were important in the formation of *intentions*, although they do not fully explain stated intentions.
- Beliefs about climate change are *not* important when it comes to *actual* travel behaviour change.
- Socio-economic characteristics and age do not explain the differences in willingness to change.
- Many of those who had already made some changes to their travel or domestic arrangements to reduce their carbon emissions were initially resistant to (further) change.
- The main behaviour changes were reductions in the number of shopping trips, combining journeys and conducting at least some activities more locally.
- No systematic shift to other transport modes was seen.

[11] NB This section presents results based on analysis of psychographic questionnaire and travel diary data. Caution must be taken when interpreting the findings due to the small sample sizes involved. The intention of the analysis presented in this section is to be considered as indicative rather than representative of the wider population.

[12] NB This research was completed prior to the significant rise in petrol prices in the summer of 2008.

4.2 Existing low CO_2 emission travel behaviours

A few participants had made changes in their travel patterns before becoming involved in the project.[13] **This impacted on their perceived ability and their willingness to consider further changes**. Those who had already reduced their car use in particular, perceived fewer options as being available to them. Among the Educated Professionals, those who had made changes to both their domestic and travel behaviours appeared very unwilling to make further changes and did not react well to being asked to do more, at least at first.

Using stimulus materials (see Technical Report Volume I) to outline a range of behaviours that could be considered (for example, internet shopping, car sharing), we asked participants whether they had already made any changes in their travel. **The most common activities participants reported having already taken-up included checking that car tyres are pumped-up, walking or cycling for some local journeys, combining trips and shopping locally.** These actions had been adopted for a variety of reasons including a desire to drive less, often motivated by the health benefits of walking and cycling, convenience (for example, because parking is difficult), time saving (by combining trips) and cost cutting (such as petrol prices and parking costs). Activities that a minority of respondents reported included checking emissions ratings when buying a car, informal car sharing and working from home. Some participants had been using the Internet to shop for food, clothes and electrical goods but this was for reasons of convenience rather than because of environmental concerns.

It is difficult to draw out the extent to which the existing reported behaviours were performed consistently or the extent of their practice because the focus of the project was on change during the project. **Some participants had clearly been motivated by pro-environmental attitudes or had adopted a pro-environmental stance consistent with lifestyle choices but this was not necessarily motivated by concern about climate change; some just felt a responsibility to care for their surroundings and others did not like waste.**

4.3 Willingness, ability and intention to change

At the start of the project just over a half of the frequent car drivers were willing to reduce their car use and this increased significantly over the course of the project to almost three-quarters. Over half of the frequent drivers also expressed an intention to reduce their car use at least once a week initially, suggesting that at least some behavioural change was seen to be practicable and this grew over the project to around two-thirds. Just under half of frequent drivers felt able to reduce their car use initially and this increased to just over half of drivers by the end of the project. So, despite these good intentions to, at some point in the future, reduce car use, some of those who expressed a willingness and intention to do so still did not feel that they had the practical means to enable them to do so.

The questionnaire included a series of questions designed to determine the extent to which willingness to change might be moderated by ease, confidence in taking action and

[13] This is consistent with *"Social Trends"* where 35% of respondents indicated they already used their car less for environmental reasons (ONS, 2008).

degree of control over making changes.[14] This showed that **women frequent drivers were more likely than men to see reductions as practical and they saw themselves as more willing and able to reduce their car use**, through trip-chaining for example. **Women generally perceived themselves as having greater control over their travel modes than men.** Neither age nor socio-economic group appear to explain attitudinal differences in willingness or ability to change car usage.

Table 4.1 Frequent car drivers' intention to reduce car use over the next 11 months

		Willing to reduce car use	Intended to reduce car use at least once per week	Able to reduce car use
All Frequent Car Users (Base=88)	Initial	50	47	41
	Final	60	59	49
Male (Base=45)	Initial	19	22	18
	Final	26	28	23
Female (Base=43)	Initial	31	25	23
	Final	34	31	27

Base: All frequent drivers answering questions, 88

Table 4.2 shows the variation in intentions to reduce car use once a week by lifestage group. The very high proportions of Younger People and Less Affluent Younger Families initially intending to reduce car use stand out. These two groups had the lowest average carbon dioxide emissions and were the groups with least disposable income where financial motivations to change may be important. The older groups reported less intention to change initially although by the end of the project intentions to change had increased across all groups. The exception to this was Younger People who started with high intentions to reduce but this decreased, possibly due to lifestyle aspirations.

Table 4.2: Variation in intention to reduce car use once a week by lifestage group

		Initial			Final		
Group	**Base**	**Intending to reduce**	**Neutral**	**Not intending to reduce**	**Intending to reduce**	**Neutral**	**Not intending to reduce**
Educated Professionals	22	10	3	9	15	1	6
Middle Class Families	22	11	5	6	14	4	4
Younger People	8	7	0	1	4	0	4
Less Affluent Mature Families	20	9	3	8	13	3	4
Less Affluent Younger Families	16	13	0	3	14	0	2

Base: All frequent drivers answering questions, 88

[14] In psychology these terms relate to the concept of Perceived Behavioural Control, see glossary.

Despite these differences between the lifestage groups, socio-economic characteristics and age do not explain the differences in willingness to change, which suggests that attitudes to climate change may be better predictors of behavioural *intentions*. The sample sizes are however small and this should be interpreted cautiously.

Generally the project engendered a view among those who continued through all the meetings that they should change their travel behaviour because it would be good for them, as well as for the environment. **Environmental impact was generally of secondary importance in deciding to make changes; an incidental spin-off from personal benefits such as cost and time savings and health improvements.**

> *"I think that's the easy message that comes out, that it's basically cost driven and if it nicely couples up with carbon, well that's lovely…"*
> *"…It's like a bonus isn't it?"*
> Educated Professionals, males (meeting 5)

It is interesting to note that individual questionnaire responses reveal differences, as we expected, from the group discussions, where peer pressure led to particular views dominating. There were instances where body language revealed that those willing to make changes had silenced, those who were unwilling and vice versa.

4.4 Reported change

The discussions suggest that **the actions most participants said that they might try were those that were relatively easy to make because they did not impact negatively on costs, time, convenience or lifestyle in general.** Using the actions list as a guide (see Technical Report Volume I), but providing more information on actual behaviour changes in the discussions, participants were most likely to say they actually tried:

- walking for journeys of up to two miles;
- cycling for local journeys;
- cutting down the number of shopping trips for incidental food and newsagent items;
- trip-chaining to reduce unnecessary journeys by combining errands at the weekend and shopping on the way home from work;
- driving with smooth acceleration; and
- checking that their vehicle tyres are pumped up.

Analysis of the travel diaries allows some validation of participants' stated intentions. This information was also used to calculate the amount of carbon used for each journey and to give an estimate of the carbon used per person, per week. The travel diaries included information on the types of vehicle driven, the number of people in a car and trip distances. They therefore provide a good estimate of carbon consumption from behaviour changes relating to changes which impact on these variables. The estimates do not however, capture the impacts of changes to driving style or pumping up car tyres for example, nor do they provide a complete picture of the impacts of working from home.[15]

[15] Efficient driving techniques would act to reduce carbon consumption compared with that reported. Measures such as home working and home shopping will have some other associated emissions (heating and electricity, delivery vehicle usage) which are not included. This is estimated to have only a small impact on the accuracy of the reported conclusions relative to the large amounts of travel undertaken. The

The travel diary analysis was used in the deliberative events to provide feedback to participants on the impacts of any changes they made. The following section provides an indication of the headline changes in carbon use, subject to the caveats listed above.

Overall, there was no significant change in carbon usage from the first to the final travel diary. Within this, 62 participants cut their carbon usage (we refer to this group as 'carbon reducers') whilst 49 either made no change or increased (46 increased) their carbon usage (referred to as 'carbon non-reducers'). Details of how this splits between different lifestage groups are provided in table 4.3. Seven participants consistently reduced their carbon consumption from one diary period to the next, throughout the project.

Table 4.3 Change in carbon usage by lifestage group

Group	Base	Carbon consumption change (%)	Number of carbon reducers	Number of carbon non-reducers
Educated Professionals	23	-16	12	11
Middle Class Families	26	+11	15	11
Younger People	14	+122	3	11
Less Affluent Mature Families	26	-25	16	10
Less Affluent Younger Families	22	-23	16	6
Total Change	111	-3	62	49

Base: All those with full records, 111

The Younger People showed the largest increase in carbon used between travel diaries one and four (from the lowest starting level) and the Less Affluent Mature Families showed the largest reduction.

Younger People held the strongest beliefs that climate change was a problem and expressed, initially, the greatest intention to reduce car use. By contrast they also felt it was less of a problem for their personal quality of life and less of a threat to the UK than other groups (section 3.3.4). The discussions within this group suggest that many aspired to greater personal freedom and greater social status, which is associated with car ownership and this is consistent with previous research (Steg, 2005).

In all of the groups, except Younger People, more than half of respondents reduced their carbon use. Despite some substantial variations between groups, lifestage, gender, age group, socio-economic group and whether or not participants had children living at home were unable to explain changes in carbon used between the first and last travel diaries. This is not surprising as previous studies suggest that individual and collective motivations might be better explanatory factors of change than socio-demographic variables (Jopson, 2003; Anable et al., 2006).

RAC Foundation estimates for example that two-thirds of an office worker's energy consumption is spent on transport to and from their place of work and there are energy uses attributable to individuals at work as well as at home. Further details on the travel diary and carbon calculations are available in the Technical Annex to this report.

4.4.1 Number of trips

Overall there was a statistically significant and consistent reduction in the number of trips made by participants across the study period consistent with the types of actions they reported trying. This is consistent with the dialogue from the meetings which focussed on reducing the number of separate trips and 'unnecessary journeys'. Unnecessary car journeys were those which could be walked or combined with other journeys. Indeed, across all the lifestage groups participants reported that they were trying to trip-chain as a simple way to make an impact on carbon consumption and save time and money.

> "*Trip-chaining can actually benefit your lifestyle – planning things can give you more time.*"
> Educated Professionals, male (meeting 5)

However, the telephone interviews found that some struggled to maintain trip-chaining as not everyone was sufficiently well organised to plan ahead.

Participants were surprised by how much they drove and the number of individual trips they made. This made some frequent drivers think about reducing their car use for the first time and there was some willingness to reduce the number of trips, by trip-chaining and walking shorter journeys. Some women with younger children felt that they could walk the children to school. However, other women felt time pressured and dropped children at school on the way to work. Some frequent drivers, especially the men, were also stimulated to consider changing their driving habits by the discussions about the cost savings.

In particular **participants were shocked by the number of shopping trips they made** and trips to purchase very few items came to be seen as 'unnecessary' with better planning for the weekly shop. **The result was a reduction in the average number of shopping trips from 5.1 in the entry travel diary to 1.9 in the final diary.** The discussions revealed that food shopping was often undertaken on the way home from work as part of an existing journey.

Feedback from the travel diaries showed the degree of change surprised participants.

> *"It's quite surprising, I didn't think any of us had really made that much of a change but clearly we are considering things more, and we're doing more, from what this group have said, doing more tri- chaining, which seems to be the big difference."*
> Educated Professionals, male (meeting 5)

Carbon reducers and carbon non-reducers made around 30 trips per week at the start of the project. By the end the carbon reducers had made a significant cut in trip levels to 23 per person whilst carbon non-reducers were still making approximately 30 trips per person.

As a group, the carbon reducers decreased the number of trips they made for all purposes which suggests a conscious decision to travel less. The biggest reductions were for trips classed as 'other' (this includes, for example, collecting/dropping off relatives). **Carbon non-reducers as a group also cut the number of trips they made for all purposes**

except business and commuting. It is possible that these participants had less control over making changes to trips for these purposes than others. The follow-up telephone interviews supported this, finding that individuals mentioned the types of jobs they held and some of these (for example, builder) inherently restricted their transport options due to the context and practical needs of their journey.

4.4.2 Distance travelled

Comparing the entry diary week with the exit diary week, the distance travelled reduced, although this was not statistically significant. However, carbon reducers made a substantial cut in the distance travelled (from 308kms to 189kms) while carbon non-reducers substantially increased the distance they travelled (258kms to 380kms).

The carbon reducers made a substantial cut in distance travelled for business and 'other' purposes. **Distances travelled for shopping and visiting reduced by over 50% between the start and end of the study. The average length of shopping trips decreased from 5km in the initial travel diary to 3.9km in the final diary** which reflects the intentions of participants to shop more locally.

The carbon non-reducers increased the distance they travelled across all trip types except business. Carbon non-reducers were largely responsible for the overall increase in long distance leisure journeys in the final diary period.[16] Leisure trips include visiting elderly parents and grown-up children living in other towns in the UK. Some of these trips were seen as essential and others as fairly essential, although mode and frequency might be varied. The discussions confirmed that some of the distance reductions were made on purpose (such as shopping and 'other' trips) whilst other reductions in distance (such as visiting friends and business trips) were subject to substantial variations in distance due to external influences.

4.4.3 Mode of transport

Overall, the main reason for changes in the number of trips and the distance travelled appears to be variations in car-based travel rather than a systematic mode shift to other forms of travel. **Whilst increases in walking and cycling were observed during the project, these appear to be linked to better weather.** These changes were not maintained into the winter period.

4.5 Explanation of changes

Two-thirds of frequent car users reported having tried to reduce their car use, and just under half of them said they would continue to try to do so after the final meeting. Analysis of the entry and exit travel diaries found that just over half had reduced their carbon emissions. Carbon reducers who claimed they would continue to try to reduce their car use were significantly more likely to feel a personal responsibility to do so for the sake of the environment than those who did not. The Theory of Planned Behaviour was used to try to explain the changes in behaviour[17].

[16] Where the travel diary indicated that it covered an extended holiday period away from home (and not just a leisure trip), the data have been excluded from the analysis. This is in line with the National Travel Survey analysis procedures. Time off at home has been included.

[17] See glossary for summary and Technical Report Volume II for a full description of the Theory of Planned Behaviour. The Stages of Change model (see glossary) was also tested but did not add anything to the explanatory model.

A model based on the Theory of Planned Behaviour was generated to explore the extent to which attitudes towards behaviours, subjective norms, perceived behavioural control and personal norms could predict the intention to change. **Perceived behavioural control and personal norms were the only significant predictors, which suggests that certain beliefs about climate change are important in the formation of *intentions*, although they do not fully explain them.** Notably, the proportion of intentions explained by perceived behavioural control and personal norms was greater at the end of the project than at the beginning. Thus, provision of information has strengthened the relationship between perceived behavioural control and personal norms, and intentions.

A second model also based on the Theory of Planned Behaviour tested the extent to which intentions to change and perceived behavioural control could explain the number of car and van driver and passenger trips. **This second model suggests that beliefs about climate change are *not* important when it comes to *actual behaviour*;** indeed the model indicates that there is little or no linear relationship between trips and intentions or perceived behavioural control at the start or end of the project.

These findings confirm the discursive data; hence we can reliably conclude that **understanding the contribution of CO_2 emissions from transport made participants think about the need to change their behaviour, and form intentions to do so based on control and personal norms. However, understanding and intentions based on beliefs about climate change are not enough to explain actual behaviour.** As the following chapters discuss, this needs to be considered alongside the range of wider motivators and barriers that further limit actual behavioural choices.

However much some people believe they need to change their travel behaviour to mitigate climate change, and want to change, providing information about climate change and individual contributions alone seems unlikely to achieve actual travel behaviour change.

4.6 Summary and conclusions

A small proportion of participants had already made some form of travel behaviour change for environmental reasons before becoming involved in the project. Only after some discussion were most of this group prepared to consider doing more.

The behaviours that participants were most likely to say they actually tried over the course of the project, and that were therefore feasible, were:

- walk for journeys of up to two miles;
- cycle for local journeys;
- cut down the number of shopping trips for incidental food and newsagent items;
- trip-chain in order to reduce unnecessary journeys by combining errands at the weekend and shopping on the way home from work;
- drive with smooth acceleration; and
- check that tyres are pumped up.

Participants' **abilities to reduce the number of shopping trips, to combine journeys and to conduct at least some activities more locally is at the heart** of the travel behaviour change observed.

Overall, **the main reason for changes in the number of trips and the distance travelled appears to be changes in car-based travel** rather than a systematic mode shift to other forms of travel. Whilst **increases in walking and cycling** were observed over the course of the project these **appear to be linked to better weather**, were **not maintained into the winter** period.

Taking the travel behaviour data together with the reported intentions and attitudes to climate change from chapter 3 we conclude that **feelings of personal responsibility to take action over climate change and feelings of control over making behaviour changes are important in the formation of intentions**.

Those with greater acceptance that climate change is a problem and that their personal contribution makes an impact, and who feel a responsibility to act will be more likely to form intentions to change. Information about climate change is clearly linked to the formation of intentions and this is important since intentions precede behaviour. Over the course of the project intentions to reduce car use have been shown to increase, and those participants who reduced their carbon consumption had stronger reported feelings of personal responsibility towards the environment.

However, **no clear relationship could be established between intentions to reduce car use and actual travel behaviour**. So, **attitudes to climate change influence intentions regarding car use**, yet there is **clearly a gap between intentions based on climate change and actual behaviour**.

This suggests that **programmes to stimulate behaviour change should** seek to exploit good intentions by **framing behaviour change** in the context of helping tackle climate change. This should be as **part of a package of other** potentially interacting and stronger **motivations** for change**.**

In framing communications messages it is important to demonstrate that **relatively easy lifestyle changes make a difference to the cost** of travel by reducing fuel consumption**.**

5 Influencing Travel Behaviour

5.1 Introduction

Chapters 3 and 4 provide a framework within which to assess the additional barriers to specific travel choices to reduce CO_2 emissions. This chapter identifies and explores the perceived barriers and incentives to behavioural change which could result in reducing the impact of personal travel behaviour on climate change. During the project participants were asked to consider a number of options that would potentially lead to a reduction in their travel-related carbon consumption (see Technical Report Volume I for details of options discussed). This chapter draws out general motivators and barriers to change to provide an overview of the issues under four headings: attitudinal and emotional; lifestyle; practical; and policy and governance.

Chapter 6 then considers the barriers and motivators to personal transport behaviours that would reduce CO_2 emissions.

Key findings:

- There is no social pressure to change travel patterns to reduce carbon consumption but neither is doing so perceived as socially unacceptable.
- The perceived motivators and barriers to behavioural change can be classified as attitudinal/emotional, lifestyle, practical and policy/governance. (Informational barriers are discussed in the next chapter.)
- Actions which require a fine tuning of current behaviours, and that therefore do not impact significantly on lifestyle, were more likely to be tried.
- Changing domestic use was perceived as easier than changing transport behaviours.
- Modern lifestyles have created a need to travel quickly between locations on a daily basis, which acts as a key barrier to behavioural change.
- The context in which a journey is made is important, that is, the factors surrounding the trip, such as importance of arrival time and what has to be taken on the trip, which are not directly related to journey purpose.
- The main factors which define how people will respond to climate change messages are:
  - lifestyle image and aspirations;
  - level of personal control over taking action; and
  - strength of feeling of personal responsibility, which is conditioned by the strength of belief in:
    - the role of human activity in causing climate change; and
    - the impacts of individual actions.
- People are willing to pay more for convenience.
- Some scepticism exists over Government's motives with some seeing climate change as a way to raise taxes. Regulation was said to be preferred to tax increases.
- Leading organisations and figures have a role to play in encouraging behaviour change.

5.2 Attitudes and emotions

In general, this research has found that strength of concern about climate change was too weak to impact on travel choices relative to other factors. However, there was evidence that some participants could be stimulated to think about climate change and thereby to change their behaviour in response.

This study has identified a number of attitudinal and emotion-related factors that influence travel choices and serve as wider motivations and barriers to travel behaviour change.

5.2.1 Responsibility to act

Section 4 established that a feeling of responsibility to act to reduce car use for the sake of the environment is an important part of motivating intentions to reduce car use. Within the discussions two polar groups emerged. First, **there was a group who believe climate change is happening and that human actions have an impact but who do not care enough to change their behaviour.** This group probably has a higher proportion of males and a greater representation of under-30 and over-50 year olds. At the other end of the spectrum there was **a group of participants who felt that even if the impact was small, 'doing one's bit' to combat climate change was important** and that if combined, individual actions do make a difference. Some of this group believed this at the start of the project, others came to this view as a result of the information presented. Members of this group were spread across all of the lifestage groups.

In between these groups was **a group of participants which accepted that climate change is happening and that it is caused by human activity but who felt that their individual actions would not make a difference**. This group cited emissions from industry and from the USA, China and India as the main issue to be tackled. As with the first group, this group probably has a higher proportion of males.

The first of these three groups is so far from even contemplating revising their behaviour on climate change grounds that messages about it would not act as motivators to behaviour change. The second group is willing to consider change, may act directly on information and is open to considering different types of behaviour change for the sake of the environment. The final group is more likely to respond to behaviour change messages than the first group but these are likely to be most effective when locked in with some other motivating message, for example, money or time savings.

It has not been possible to establish why some people feel a sense of responsibility towards the environment and others do not.

5.2.2 Guilt

The importance of a sense of personal obligation also came out through the discussions expressed as feelings of guilt. We asked some participants who said that they felt guilty to define what they meant. In summary, it was defined as 'knowing you are doing something you should not; knowing what the right thing to do is, but continuing to do the wrong thing'. **Women were more likely to express feelings of guilt than men.**

Guilt can be a motivator but it was never discussed as such by the participants in this study and is therefore unlikely to be an effective lever for use in communications to encourage behaviour change. As an emotion it was always referenced in the context of excuses to justify behaviour.

Guilt tended to be expressed by those who had begun to think about making changes but who had not yet made any.

> *"I just feel entirely guilty every time I go on silly trips* [by car] *…it* [the project] *hasn't altered what I do, it just makes me feel really guilty about it."*
> Less Affluent Mature Families, female (meeting 5)

Those who were sometimes able to implement behaviour change but who were inconsistent in doing so, also said that they felt guilty when they lapsed. Time seems to be the main pressure that results in behaviour change reverting or never being adopted, despite good intentions.

> *"It makes you feel guiltier, you know, where you think oh sugar, I'm too late now* [to use public transport] *or whatever and you'll go and do it* [use the car] *but you'll feel guilty about it."*
> Less Affluent Younger People, male (meeting 5)

Participants tended to look for justifications for their actions to allay their feelings of guilt, for example, by saying that the trip was essential or even not really a trip at all because they were on their way somewhere else.

> *"I feel guilty dropping my kids to school but I'm normally on the way to work."*
> Less Affluent Mature Families, female (meeting 1)

Some used the fact that they had saved carbon in other areas of their lives to overcome their feelings of guilt. For example, if they reduced how much they travelled by car, they felt they could go abroad on holiday instead. Similarly, others used the argument that they did not consume as much carbon as other people, to alleviate their feelings of guilt about their travel choices.

> *"Although I, to a certain extent, feel guilty about the long haul flight, I think, well that is just one flight and I'm going for a long period of time, which really balances out to me the really cheap flights to Europe where people are going on flights that aren't terribly necessary just simply because they are cheap."*
> Educated Professionals, female (follow-up telephone interview)

Hence **guilt was an emotion often expressed by some participants when they felt that they should, and could, have used a less carbon intensive mode of transport but had not.** Feelings of moral obligation and a responsibility to act to tackle environmental problems are linked to intentions as demonstrated in Section 4.3.

5.2.3 Stress

This research identified **a group of women who find driving long distances, driving on motorways or driving in unfamiliar places, stressful**, and who are willing to undertake these journeys by public transport, even if it is (slightly) more expensive.

> *"It* [getting the train] *was quite easy. In fact I'd definitely do it again because I could just read on the train, and there wasn't as much stress as, you know, the traffic, I hate that drive down to London … you know for the sake of a few phone calls and a bit of time on the internet booking your ticket in advance. It really did pay off."*
> Less Affluent Younger Families, female (follow-up telephone interview)

Whilst stress is not related to environmental issues, it is a further example of another journey attribute (like time or cost) which can be linked to pro-environmental messages.

5.2.4 Social norms

There is no social pressure to change travel patterns to reduce carbon consumption but neither is doing so perceived as socially unacceptable. Moreover, the views of peers seemed to have no influence on car use. This conclusion from the deliberative discussions is supported by the Theory of Planned Behaviour modelling (reported in section 4.5) which found subjective norms (the impact on behaviour of the views of significant others) were not significant in the explanation of an individual's intentions.

Importantly, **being 'too green' has negative connotations** as it is associated with a *"hair shirt"* mentality. A degree of personal sacrifice that impacts on quality of life and that made life more uncomfortable or inconvenient was not something with which our participants wished to be associated. Such behaviour was generally derided.

> *"It needs to be cool doesn't it? It* [environmentally friendly action] *needs to be seen as a good look, …like cycling into work, instead of getting laughed at by your mates when you get to work on a bike."*
> Younger People, female (meeting 5)

Hence there is no social pressure to change behaviour towards less carbon intensive transport modes, although some level of reduction that does not reduce quality of life may be perceived as good by some. There is also a range of actions which offer carbon reductions without impacting on personal image (such as occasional home working and trip-chaining).

5.3 Lifestyle

In general, this research has found that changes that fit easily into established lifestyle patterns are easier to persuade people to make and are more likely to be sustained.

This study has identified a number of lifestyle factors that influence travel choices and serve as wider motivations and barriers to travel behaviour change.

5.3.1 Impact on lifestyles

Modern lifestyles have created a need to be able to travel quickly between home, work, school, childcare, shops and social pursuits. Consequently a strong message relevant to travel behaviour change was minimising the perceived impact of change on lifestyle. The way that towns are planned means that the distances between locations were said to have created an increased need to travel. This has resulted in people feeling that they **need to be able to travel quickly between locations to complete all the tasks they need to undertake in a day**.

The restrictions imposed by public transport timetables and routes were often believed to be incompatible with the lifestyles of participants – both in terms of work and their personal lives. Travelling by public transport was said to take longer than travelling by car and to limit personal control over when and where individuals can travel, because public transport routes and timetables are outside the control of the individual. The emphasis placed on personal control by participants is supported by the findings of the Theory of Planned Behaviour modelling (reported in section 4.5) which found perceived behavioural control to be a significant factor in explaining intentions.

Modern lifestyles have also created a reluctance to share transport with others by, for example giving lifts and informal car sharing, because of the possibility of personal inconvenience and delay. Moreover, some participants valued time spent alone in their car to listen to music and/or think.

In general, **actions which require a fine-tuning of current behaviour and therefore do not impact significantly on lifestyle** (for example, efficient driving, trip-chaining, home shopping and conducting several activities in one place – see sections 6.3 and 6.4 for more details on each of these activities) seem to be **seen as more available and feasible** to respondents than does changing from using private to public transport. This perspective perhaps reflects the comparatively short timescale of the study period. The telephone follow-up interviews found that some participants had made more changes after the final meeting. These changes were usually linked to lifestyle changes, such as changing jobs, moving house, a child learning to drive, and there was no consistent pattern. From this we conclude that it may be that more significant changes take longer to incorporate into travel patterns.

Making **changes to travel modes and patterns was generally seen as taking more effort both physically and mentally, than making changes around the home** such as using energy saving light bulbs, installing insulation and turning off electrical equipment. Such changes around the home are low effort, do not impact on lifestyle or perceived quality of life and are more readily perceived as bringing a positive benefit such as saving time and/or money.

5.3.2 Habit

There is a **high degree of reported and acknowledged habitual car use** amongst frequent car drivers; that is, participants always made certain types of journey by car and did not even consider using another mode. It is easier to get people to consider changing the way they make some journeys than others but it is difficult to change habits, as it requires a change both in mindset and behaviour.

5.3.3 Health

Cutting across the five lifestage groups is **a group** of participants who tended to think that **irrespective of whether or not climate change is the result of human activity, making changes to travel behaviour is beneficial**. Some of these individuals were driven by the personal health benefits of a more active lifestyle and a desire to improve air quality generally.

5.3.4 Aspirations

Another group of participants, especially, but not only, younger men, saw **car ownership and use as a mark of personal success and growing-up**. This is reflected in the findings described in chapter 4, where we show that car use increased among Younger People.

5.4 Practical issues

The discussions also clearly emphasised a number of well understood practical motivators to changing, and maintaining changes in, travel behaviour (DfT, 2006; Quinet and Vickerman, 2004) and these are highlighted below.

5.4.1 Journey context

The **context in which a journey is made is important but this is not the same as the purpose of the journey**. What influenced travel choices, notably mode choice, was whether there were materials to be transported (for example, luggage, shopping, work equipment), the importance of arriving on time, whether the journey was part of the activity or just necessary to get to a specific event and whether children were travelling.

5.4.2 Cost and convenience

Travel behaviours that can save money and time led all participants to reflect on their feasibility for them and their family. However, convenience is clearly also a factor and **participants were prepared to pay more for convenience**. Convenience is closely related to journey context, as the context of the journey usually determines what is convenient for the specific journey. Moreover, participants recognised this and repeatedly referred to the balance between cost and convenience as the most important in making changes to their travel patterns.

Besides inconvenience, there was also **a sense that a lower carbon lifestyle may be more expensive**, as chapter 7 discusses, some of the new technologies were seen as only appropriate for better off members of society.

> *"There may be a perception in some less affluent areas that being green and saving the planet are upper class or middle class activities."*
> Educated Professionals, male (meeting 5)

Indeed, there were a few participants whose lives were under pressure financially and time-wise who found it difficult to maintain changes after the fifth meeting (reported in the telephone interviews). Examples were given of public transport taking longer for specific journeys than travelling by car, which not only lengthens the 'working' day but can also increase childcare costs because childcare is needed for longer. By contrast, those who are time poor but financially better off were seen as able to fund lifestyle changes, should they wish to do so.

5.4.3 Waste

There was **a group** of participants, particularly older people, **who viewed waste of any kind as bad**. Even though this group tended to be somewhat sceptical as to whether human activity was causing climate change, they were motivated to change their behaviour by the prospect of saving time, money or natural resources.

5.4.4 Personal safety

Concern about personal safety tends to lead to car transport being preferred. By personal safety we mean fear of attack, not fear of traffic. Women were more concerned about personal safety than men but some men raised concerns about female friends and relatives or women in general travelling by public transport, particularly at night.

5.4.5 Weather

Participants were generally **more prepared to use** more active modes of transport, (**walking and cycling**), **in the warmer and lighter summer** months and this is supported by the evidence from the travel diaries.

5.5 Policy and governance

This research found that high profile groups in society taking a lead can motivate others and that the behaviour of these groups can also be demotivating. It also found that Government regulation was favoured over taxation to encourage behaviour change and that education was seen as an important part of the policy mix to encourage behaviour change.

5.5.1 Leadership

People are influenced by the actions of leaders in society and the actions of the UK Government, big business and celebrities were specifically mentioned. The behaviour of these high profile groups can affect attitudes and motivate wider public action by setting an example. Equally, a lack of visible action from these groups can be a barrier to widespread action.

Participants were less interested in policies and more interested in the actual behaviour of Government and employers. If Government and employers, especially larger employers, are seen to change their behaviour, our findings suggest that this will encourage individuals to change.

> *"They* [Government] *spout on about us changing our carbon footprint but then they don't. You don't see them, there still driving their big cars and getting private jets. So, you know, they're not actually doing anything."*
> Less Affluent Mature Families, female (meeting 5)

5.5.2 Regulation

Across the groups, participants were aware that regulation is unpopular and that Governments prefer not to regulate[18]. However, the Middle Class Families in particular (but all groups to some extent) argued that **only regulation would produce a big enough change in behaviour to have an impact on greenhouse gas emissions**. For them, regulation took two forms – changing the relative costs of different transport modes and banning high emission goods (i.e. choice editing), such as sports utility vehicles (SUVs).

> *"You choose the vehicle you've got because it's available. If things weren't available, if we haven't got the choice, we would go with what's there."*
> Middle Class Families, female (meeting 2)

[18] Participants talked about regulation and did not distinguish between regulation and legislation. We therefore refer to regulation throughout.

Generally, participants realised that banning some products would be unpopular but they felt this was the only way to ensure behaviour change, especially among the financially well off. Importantly, whilst not concluding that regulation would be accepted, participants felt that the public would only act consistently in terms of pro-environmental travel choices in the presence of regulation. In addition, participants also viewed the absence of regulation as permitting freedom of choice, which was open to non-'green' travel behaviours. If some products are banned participants felt that there must be widespread communication to ensure that the public understand why, to reduce opposition.

5.5.3 Tax

In contrast to regulation, **increasing the costs of driving was seen as regressive** as it would impact on poorer people to a greater extent than on wealthier individuals. All groups commented that the recent increase in taxes on SUVs and other high emission vehicles was likely to be ineffective. They felt that the differential needed to be much larger to have an impact, given that they expected that those with these vehicles would be financially well off and able to pay the increases without amending their behaviour. Hence in relative terms there was greater support for banning some products from the UK market than for trying to price them out of use.

5.5.4 Government policies

Awareness of current and recent Government initiatives to encourage low CO_2 emission transport behaviours was very low. There was however, a perception that some Government policies encourage more travel and the conflict between these policies and climate change policies was recognised. The example given by the Middle Class Families was choice of school. Another example, frequently mentioned, was the building of new runways at UK airports encouraging more people to fly.

It was thought that Government should use town and transport planning to ensure that facilities are accessible without the need for cars. Government was also seen to have a role in providing a public transport system that is safe, clean, efficient, and frequent but most importantly, reliable and cost effective when compared to cars. However, as chapter 6 discusses, there are a number of barriers to using public transport even when it is available.

5.5.5 International role of the UK

Climate change was seen as a global issue. All groups were aware, in general terms, of the UK's commitment to reducing emissions, although none knew the details. However, **only a minority** from the Educated Professionals and Middle Class Families **understood that Britain should, or could, act as a role model** and that in doing so might impact on the behaviour of others. Other participants felt that **as a very small country Britain's contribution to reducing climate change would be negligible**. Moreover, they saw no reason why Britain should take action when other countries did not, as far as they were aware. The USA, China and India were most frequently mentioned as big and growing emitters of carbon dioxide who were perceived as unwilling to act.

5.5.6 Education

All groups spontaneously mentioned the **need to educate children to influence their behaviour** from an early age. They saw the school system and curriculum content as central to this. Examples were given of children stimulating recycling in households and it was felt that a similar approach could be taken with carbon reduction from travelling.

5.6 Typology of population subgroups

Based on the findings presented in chapters 3, 4 and 5, different attitudinal groups can be suggested as existing within the UK population based on:

- whether they believe that human activity causes climate change;
- whether they believe that their personal actions impact on climate change; and
- whether or not they feel a personal responsibility towards the environment.

It can be hypothesised that each group would respond to different messages. This is consistent with the existing evidence base that concludes a 'one size fits all' approach to marketing low carbon transport behaviours would not be effective.

In general these groups cut across the lifestage groups, gender and to a lesser extent age. This bears out the conclusions of Anable et al. in concluding that traditional approaches to population segmentation focusing on socio-demographic factors will not map onto the attitudinal and motivational differences that exist within the population overall.

The **key underlying factors which should help to define these groups** are:

- **lifestyle image and aspirations;**
- **level of personal control over taking action; and**
- **strength of feeling of personal responsibility which, in turn, seems to be conditioned by the strength of belief in:**
  - **the role of human activity in causing climate change; and**
  - **the impacts of individual actions.**

Drawing on this we suggest a preliminary typology of some broad behaviour groups to whom different types of messages might appeal. This work is exploratory in nature and is only indicative yet justifies research focused more specifically on the identification and quantification of attitudinal segments within the population, which further supports the conclusion of Anable et al[19].

Importantly, consideration of the Defra (2008) segmentation of pro-environmental behaviours shows some overlap with identified segments. Where possible we have referenced these groups with those identified in the Defra segmentation.

There is **a group** of participants who **believe climate change is happening and that human activity is a contributor; they care about climate change but feel that they are unable to act because at this point in their lives they have other priorities**, mainly children and work. Messages which connect to the time saving and convenience agenda

[19] The Department for Transport currently plans to use the findings of this research to take forward a more detailed segmentation study of public attitudes to climate change and travel choices.

and raising awareness of actions that are easy to implement, like efficient driving and trip-chaining, are likely to be effective with this group. This **'believe but busy'** group is similar to Defra's 'Sideline Supporters', who believe that climate change is a problem but who are not aware of their carbon consumption and forget to sustain low carbon activities, like turning things off.

Another group with very similar beliefs are **the 'contributors'** who **are prepared to take action because they believe that small actions by many people will have an impact on climate change**. They strongly support the idea that everyone should 'do their bit'. They are concerned about their children's future and hope that their behaviour will influence others. This group is typically more open to a wider range of behaviour change options, including those that take more effort (such as walking and cycling more) than those likely to be adopted by the 'believe but busy' group. More information about actions and their impact would motivate this group. This group are similar in some ways to Defra's 'Positive Greens' but they are probably less committed to radical lifestyle change than the 'Positive Greens' and would possibly also include the 'Concerned Consumers' and the 'Cautious Participants'.

There is **another group** who are **sceptical that human activity impacts on climate change**. They **tend to think observed changes are part of a natural cycle**. Based on this work but also on the findings from DfT, 2008, this group is likely to be quite small. The group can be motivated by cost and time saving arguments but not by environmental considerations. There is no direct parallel in the Defra segmentation with this group of **'deniers'** but they can be **motivated by financial savings** and in this respect may be similar to the 'Waste Watchers'.

A **fourth group believe that climate change is happening but do not believe that their actions will make a difference**. **Some may feel powerless**; **others** may use this as an excuse not to act because they **do not care enough to change**. The planned segmentation study will be able to determine more clearly whether this is **one group of 'ineffectuals' or two groups: 'powerless' and 'don't care'**. Those who feel powerless could potentially be motivated through developing their understanding about what difference actions they can take would make and may therefore be somewhere between the 'believe but busy' and the 'contributors'. Those who do not care will be motivated by personal benefits and may be similar to the 'deniers' and to Defra's 'Honestly Disengaged'.

There are also those, **particularly younger people**, who are **quite well educated about climate change but who have lifestyle aspirations that deter them from taking actions** that will reduce their carbon consumption and at this lifestage do not care enough to change their aspirations. Although these **'aspirationals'** are apparently difficult to penetrate now, policy messages may help to condition lifestyle choices in the future. This group is very similar to Defra's 'Stalled Starters' and although we found that they were quite knowledgeable, they may not feel themselves to be.

There may also be **a group of mainly women who dislike driving** and who may react well to messages giving other reasons to drive less, even if this costs a little more.

This study is not a statistically representative sample of the population, so we can say little about the likely size of each group in the UK population. Moreover, the research

excluded those with very low carbon lifestyles and those living in very rural areas. A planned DfT quantitative research study will be able to size the groups and link attitudes to other attributes more reliably than this qualitative study.

5.7 Summary and conclusions

This research identified a range of factors that act as barriers and motivators to travel behaviour change that would reduce CO_2 emissions from personal travel. These can be grouped as attitudinal and emotional, lifestyle, practical and related to policy and governance.

Attitudinal and emotional issues encompass feelings of responsibility to act, guilt, stress and lifestyle aspirations. This research has found that a feeling of responsibility towards the environment and a belief that climate change is happening can **impact on intentions** to take action but is **not sufficient to motivate action** with regard to transport. It appears that there are too many lifestyle and practical barriers to be overcome by attitude alone, at least for most people. This research has not been able to determine why different individuals have different attitudes and emotional responses towards the environment and climate change but we have established that it is not strongly related to standard socio-economics or demographics.

Lifestyle aspirations and individuals' 'social norms' can impact on behaviour – that is, whether an individual feels that it is socially acceptable for them to reduce carbon consumption from their travel patterns, given the image to which they aspire. Other lifestyle issues are cost, health and habit. **Making low carbon transport options aspirational would encourage travel-related behaviour change but it must also be practical for people to switch.**

Practical issues, such as the context of the journey, cost/convenience, waste, town planning, personal safety and the weather form formidable **barriers to action**. Here Government can facilitate change by providing better facilities such as public transport and cycle lanes. Messages about cost and time saving play well with the public although people are prepared to pay for convenience.

It is **important that Government shows leadership and highlights the *practical* things it has done** to reduce its carbon consumption, such as switching to hybrid cars. This is **more important than publicising policies** because participants wanted to see that Government was also making an effort. **Employers** also have a role to **put in place facilities** such as car share schemes, while **celebrities can act as role models**.

The participants reacted differently to these issues and we have initially identified **several groups** which may respond to different behaviour change messages. The **key underlying factors which help to define these groups** are:

- **level of personal control over taking action; and**
- **strength of feeling of personal responsibility which, in turn, seems to be conditioned by the strength of belief in:**
  - **the role of human activity in causing climate change; and**
  - **the impacts of individual actions.**

Communication messages need to bring attitudes and aspirations together in favour of lower levels of car use while policies support reduced car use at a practical level. Examples of what individuals can do and the benefits these bring can be highlighted using Government action. This work has found some indication that people might prefer regulation to taxation because the public views higher taxes to reduce carbon dioxide emissions as regressive and unfair and potentially just an excuse to raise taxes.

6 Motivators and Barriers to Action

Building on the general motivators and barriers discussed in chapter 5, this chapter considers identified motivators and barriers to individual low CO_2 emission travel-related behaviours. Specifically this research has explored motivators and barriers related to the following travel-related behaviours:

- mode choice - including car, public transport, sustainable modes and flying;
- vehicle and fuel selection;
- car use behaviours – including efficient vehicle operation, car sharing etc;
- trip reduction strategies – trip-chaining, working at home, Internet shopping, using local shops and buying local produce; and
- using offsetting schemes.

This section also explores how travel related behaviours changed, if at all, during the project.

Key findings:

- The key considerations in modal choice are cost and time and the wider context of the journey (convenience). At best carbon reduction is secondary and is not front of mind for the majority of people.
- Participants only took into account the cost of petrol (and sometimes parking) when comparing costs between car and public transport.
- Reliability is the key barrier preventing widespread use of public transport, although cost and availability are also important.
- Buses are particularly disliked compared to trains because of their condition.
- Rail travel can be attractive, especially for long journeys.
- Awareness of travel planning websites is very low and their use is not yet embedded.
- Walking and cycling are preferred over public transport by many car users but personal security is an issue – personal attack is the concern when walking, traffic the concern when cycling.
- Awareness and understanding of the range of fuels on the market was very limited.
- The level of carbon dioxide emissions was not an important factor in car choice.
- Many people were prepared to try to drive more efficiently and to trip chain.
- Car sharing was not popular and is seen as working against trip-chaining.
- Internet shopping for food was popular with some participants but for many it did not fit with their mindset about food shopping.
- Asking people not to fly to holiday destinations met with resentment.
- Carbon offsetting schemes were unfamiliar and viewed with scepticism.
- Employers were said to be resistant to home working and for many occupations it is not feasible (e.g. building and teaching).

6.1 Mode choice

This subsection explores stated barriers and motivators related to mode choice. The discussion presented of identified barriers and motivators covers public transport and the sustainable transport modes of cycling and walking as potentially viable alternatives to the car for many day-to-day journeys. The section also presents a brief discussion of the barriers and motivators for air travel for those journeys where it is an option.

Ahead of a wider discussion of those modes, the sub-section starts by considering participants' car use. This is a useful starting point to help understand the context in which all other travel-related behaviours are considered by individuals. It will also help in the identification and consideration of both the barriers that would need to be overcome and/or minimised and the additional levers that could be used to encourage reduced car use.

6.1.1 Car travel

Initially 67% of trips were made by car (taking car driver, passenger and van together). This remained unchanged over the study period. The proportion of distance travelled by car however reduced from 86% initially to 79% by the end. This reduction, although not statistically significant, reflects some shifts towards conducting shorter car trips. However, the Younger People were noticeable for an increase of 87% in distance travelled by car. The main reductions in trips by car were for discretionary trips, including shopping, leisure and visiting. This reduction in car use does not, on the whole, seem to have been accompanied by an increase in the use of other modes of transport.

Interestingly, one Middle Class Families participant restructured his business as a result of taking part in this project, reducing the company's dependence on travelling sales staff, replacing this with development of the company website and an increased reliance on sales over the Internet.

Motivators

The main motivation expressed by participants for using cars/vans was a balance between cost and convenience, with convenience seen as speed and comfort, both physical and psychological. The balance between these factors changes depending on the the time of day, day of week, distance to be travelled, whether individuals are travelling alone or with others (children have a big impact on this balance), and whether carrying luggage, shopping or equipment is involved, we have termed this the journey context. Personal safety and perceived control over travelling time were also important to participants.

A majority of participants tended to believe that it is cheaper to travel by car than by public transport, and in some cases the cost savings were perceived to be significant, especially when more than one person was travelling. This project did not have a mechanism by which to confirm or refute these claims but the actual costs of fares for specific journeys were mentioned in discussion, so participants appeared to be aware of actual fares and not just making assumptions. Public transport costs were perceived by many to be beyond their means or unjustifiable when driving was an available option.

It is important to appreciate that **participants only take into account the cost of petrol and parking when comparing costs between cars and public transport**. Participants were explicit that **other costs were not just hidden, they perceived them as irrelevant** because they will continue to have a car and therefore to bear the costs of insurance, depreciation, etc. irrespective of frequency of car use. Thus, when deciding whether or not to travel by car, it is only the petrol costs that are considered and parking costs, where they apply.

> *"I just think petrol; I don't think wear and tear."*
> Younger People, female (meeting 5)

> *"It's* [other car costs] *hidden. It's not like taking fuel, you see how much goes in and the mileage you get out of it, it's a hidden cost, it's not one that sits in the back of your mind."*
> Middle Class Families, male (meeting 5)

Even **with respect to petrol**, we found that participants were **not generally conscious of the cost of making a specific trip**, which they were for trips by public transport, as mentioned above[20].

The inconvenience of congestion was not viewed as seriously as the perceived unreliability of public transport because **participants felt more in control** of their route **when travelling by car**, whatever the distance to be travelled. This is consistent with other DfT research exploring public attitudes to congestion, e.g. Lyons et al. (2008).

Some **participants valued the time spent alone in their cars**, especially when commuting. They saw this as time for themselves, when they could think or listen to music.

There was also a **sense among some participants that if a car journey was shared, per person carbon dioxide emissions would be lower than those from public transport**. Some participants gave this as a justification for travelling by car when with other people. Participants also justified driving alone because they often saw buses driving round without anyone on them.

> *"I've never seen a full bus, and the amount that kicks out…I have real difficulty genuinely understanding…if there's one person on that big bus that's lugging around a 5-10 litre diesel unit…so I'm very sceptical."*
> Middle Class Families, male (meeting 1)

> *"Car full of people and a bus full of people, don't think the carbon would be much different."*
> Less Affluent Younger Families, female (meeting 5)

Barriers

While participants expressed a clear preference for using cars and vans for most journeys, they also perceived some barriers to their use**. Parking was a particular barrier**; not just in terms of the **cost** but also **availability**. Some had stopped driving into town centres because of the difficulty of parking, which was considered to be expensive by all the lifestage groups.

The price of petrol was another barrier to car use. Even for the financially better off groups, cost was always a consideration because none of these participants liked to think they were wasting money, although they were prepared to pay for convenience. This was a growing concern in the face of fluctuations in the price of petrol during the fieldwork period.

[20] It should be noted that all fieldwork for this research was completed before the significant increases in fuel prices that took place in mid-2008.

Congestion discourages some people from **driving**, particularly when the alternative would enable them to avoid traffic and save time.

For a few women, **driving long distances can be stressful**. For this group, this is a barrier to car use.

Some participants used cars despite intentions to travel by public transport because events overtook them. For example, people ran out of time, something happened to delay them, the weather turned cold or wet, or they realised they needed to do several things while they were out. These types of events led people to revert to using their car, when they may have intended to use public transport or walk for a particular trip. However, the intention to use a mode of transport other than a car was weak in many of these instances, especially for participants who were frequent drivers.

6.1.2 Public transport

In general, **those who used public transport had less negative views about it than those who did not**. The discussions revealed that **women were more likely than men to say that they would try leaving their car at home and travel by public transport, and to feel that they had sufficient control over the way they travel to make changes**.

While there are some commonalities of motivators and barriers for bus and rail travel, there are significant differences with trains viewed in a much more positive light than buses. We have therefore mainly reported on the two modes separately, following the discussion of general barriers and motivators to public transport below.

Motivators

Circumstances that discourage car use encourage the use of public transport. In general, people said that they would be willing to use public transport under certain conditions: that is if it is quicker than driving and is not more expensive, if they do not have anything heavy to carry and if they are not travelling with children. When travelling unfamiliar routes or very long journeys, or when the cost is being paid by someone else, for example an employer, public transport was more appealing to some. Participants were also likely to choose public transport if they wanted to drink alcohol while they were out. Journey context (see section 6.1.1), rather than journey purpose, was important.

Barriers

Journeys by public transport that involved changes were perceived as less convenient than those that did not. Inconvenience was thought to be accentuated by barriers such as the lack of integration between modes with respect to the timing of services and the relative locations of bus stops and rail stations.

Finding relevant travel information, such as costs and timetables, was perceived as difficult by participants. The situation was said to be more confusing when multiple modes of transport were involved, as participants were unaware of any single source that would provide them with the information they needed to plan such a journey.

Awareness of Transport Direct and Travel Line were very low and even when specifically asked to look at the Transport Direct website, few participants did so. While those who reviewed the site felt it would be useful, we would conclude that using these

sources of information is **not yet embedded sufficiently in public consciousness and habit** to be helpful. This is discussed further in chapter 7.

Timetables for public transport were thought to be restrictive; many participants said that it was not possible to travel at times that met their needs. Again, this difficulty was said to be compounded when multiple modes of transport were involved.

The availability of public transport was also a problem. Sometimes participants said they were simply unable to get from one point to another by any means other than driving.

> *"Where I live, I can't easily get access to public transport, certainly not at the times of day that I need it."*
> Middle Class Families, female (meeting 5)

> *"I would say for 80% of my journeys, I could not get there by public transport."*
> Educated Professionals, male (meeting 5)

6.1.2.1 Buses

Travel by bus initially formed only a small proportion (4%) of all trips for all participants, accounting for 2% of the distance travelled. Bus use declined over the course of the study, both in absolute terms and as a proportion of trips and distance travelled, largely as a result of apparent substitution of bus travel by car travel by Younger People and Less Affluent Younger Families. Other research confirms that Younger People may have lifestyle aspirations that reduce their bus use (Steg, 2005) and this was also a feature of the discussions in this project.

Motivators
Despite this low usage, accessibility is an important motivator and the **availability of buses for some journeys was perceived to be high** by infrequent drivers and to be moderate by frequent drivers. These perceived availability figures match what we might expect to see, with some semi-rural residents in the Middle Class Families and Less Affluent Mature Families, reporting lower bus availability than those in predominantly urban areas. The **proximity of bus stops to trip origins and destinations can be a motivator** for change, especially if there is also a 'push' factor, such as high parking fees.

> *"I use the bus more since I moved as there is a bus stop nearby."*
> Middle Class Families, male (meeting 5)

For those for whom buses are in the right place at the right time, using a bus was said to be convenient and **bus lanes were said to make buses quick at peak times**. This was particularly seen as an incentive by the Less Affluent Younger Families, who were based in a conurbation. Walking to and from bus stops was said to provide an opportunity for some exercise and fresh air.

There was **demand for a local pre-paid pay-as-you-go 'Oyster' type system** by the majority in all lifestage groups. Some participants in all lifestage groups had heard of the Oyster card before the project and mentioned it spontaneously, whilst others commented that it was a good idea once they had been told about it. None of the participants discussed using season tickets as a way to reduce the cost of public transport.

Environmental concerns were not mentioned by participants as important motivators in choosing to travel by bus, even when participants did not have access to a car.

Barriers
By contrast to the motivators, the **barriers to bus use were perceived infrequency, slow journey times, unreliability, overcrowded and dirty services** which do not offer enough convenience or comfort to rival the car. Specific barriers for buses included: **access for buggies, the weather, not being organised enough to plan the journey** and allow enough time, **fear of waiting at bus stops at night and anti-social behaviour by young people at bus stops**. Many participants, especially women, felt threatened by groups of young people congregating at bus stops. The importance of different barriers varied substantially according to the quality of local services, the type of journey being considered, the characteristics of the traveller and to some extent, the context of the journey (see 6.1.1). For example, women in the Younger People and Less Affluent Younger Families groups were concerned about access for buggies, while the Less Affluent Mature Families were concerned about having to carry shopping.

Reliability, that is being sure that buses would run on time, was a major factor for everyone. Even those who had used buses in the past said that once they had children, time and convenience pushed them towards greater car use. When arrival time was important participants said that they would not rely on buses. A number of participants across the lifestage groups said that they would rather walk than go by bus for journeys of up to two miles because of the perceived unreliability of buses. A few said they would cycle rather than use the bus, although there are barriers to cycling, (see section 6.1.3.2).

Bus fares were generally **thought to be very high**, especially compared with cars or taxis when more than one person was travelling. **Deregulation** was seen to have added to the cost and difficulty of using buses in some towns and cities, despite the length of time since deregulation. The Less Affluent Mature Families group reported that different bus companies in their city did not accept each others' tickets. The **result was less flexibility**, which **further deterred** them from using buses, as does the requirement that passengers have the correct fare.

Finding timetables and information about bus routes is a major barrier to using buses, with some participants unaware of how or where to obtain this information. **Real-time bus information** was seen as **highly desirable** but some participants' experiences suggested that it was **sometimes unreliable and inaccurate**.

With respect to carbon dioxide emissions, some were concerned about the **age of their local buses and the impact on air quality of emissions**. Several participants in different groups expressed the belief that *"buses running around empty"* were worse for the environment than car use.

6.1.2.2 Rail

Rail use initially formed just 1.6 % of all trips but 6% of the distance travelled. This increased slightly over the course of the project due to a couple of individuals changing job. The changes were not found to be motivated by a desire to reduce CO_2 emissions.

Generally, trains were much more popular than buses but availability for day-to-day trips was an issue for a majority of participants. Approximately a third of participants perceived that trains were generally available to them. Those who reduced their carbon consumption generally thought the train was more available to them (40%) than those who did not (27%).

Motivators

Trains were used for commuting where they were cheaper, quicker and/or more convenient than other modes of transport, for example because parking was difficult at the destination or there was good onward public transport to the final destination. At the weekends the balance could tip towards using the car, especially if travelling with children, because it was said to be cheaper, easier and more comfortable.

For long distance journeys, participants saw using the train as something of a luxury and a treat for children and by some as an opportunity to spend time with their children. Some participants perceived train journeys to be more relaxing compared with travelling by car, particularly over long distances, as they perceived driving to be more tiring and stressful. The option of being able to walk around, read a book, listen to music, eat and drink, encouraged train use.

> *"It depends on why you're going…if you're going out drinking; driving is not necessarily going to be an option, so you have to get the train."*
> Younger People, female (meeting 5)

Not having to consider the cost because the employer was paying was a motivator and some participants talked about using the train for long distance business trips. However, none mentioned being able to work on the train as a motivator to use the train.

Although rail was generally perceived to be a better public transport option than buses when available and was not described as 'dirty', environmental reasons for travelling by train were not put forward and when comparing routes by rail and car, the discussions focused on the trade-off between cost and convenience.

Barriers

For many rail routes a few participants considered that the cost of travelling by train is competitive with the cost of travelling by car, but it was said to be expensive for families or at peak times. It can also be inconvenient when the journey involves long waits for connections between the actual origin and destination and the nearest stations.

Perceptions of overcrowding also put some participants off using trains although reserving seats overcame this barrier.

The ticket system for long distance journeys was said to be complex, with no way of identifying the best option for a specific journey. While some participants knew that rail fares could be very cheap if booked ahead, many perceived them as prohibitively expensive.

> *"A problem really with catching the train is that it's very difficult to find out really the cheapest times to take the trains and what's available. It's not an easy system to use and usually if you're trying to inquire about a train ticket they will say to you*

where do you want to go and when do you want to go, they can't say to you this is the best option for you."
Educated Professionals, female (follow-up telephone interview)

6.1.3 Sustainable travel modes

6.1.3.1 Walking

Walking was an important means of transportation for participants[21], initially forming 24% of all trips and 2.4% of the total distance travelled by the participants. The proportion of trips made on foot was highest where the proportion of trips by car was lowest.

As a proportion of all trips, initially, Younger People walked most – almost half their trips – and Less Affluent Younger Families walked about a third of their journeys. By contrast, Middle Class Families and Educated Professionals walked for the lowest proportion of their trips.

All groups increased the distance they walked between the first and second and first and third diary weeks, which were completed during the late spring to late autumn period. However, by the end of the project the only substantial change in the amount of walking was a decline among Younger People, which resulted largely from a significant increase in their use of cars. Hence we conclude that **walking is a more feasible option in the better weather and lighter evenings but participants reverted to other modes of transport in the winter**. However, in discussion participants claimed that they were walking more for local journeys.

Infrequent drivers were much more likely to perceive that walking was possible for all types of journeys, probably because they walked more than frequent drivers. However, the perceived availability of walking increased a little for frequent drivers during the project. This suggests that when given due consideration more journeys can be walked, particularly local leisure and shopping trips.

Motivators
As would be expected, participants were clear that in good weather **walking can be a pleasant experience** and this is a motivating factor. Additionally, **health benefits** seemed to be a strong incentive to walk and walking was thought to be able to help with child obesity. **Walking buses**, in which a group of children walk to school together, escorted by parent volunteers, were **viewed very positively** by most because encouraging children to walk was generally accepted as good.

While participants would not *invariably* choose to walk for short journeys, the health benefits may make them more inclined to choose this option over others. This was particularly likely when considering the barriers or disincentives of other forms of transport, such as cost or parking problems, or when the journey was considered to be short and no luggage or shopping was involved. Walking also appealed for reasons such as the opportunity to avoid being stuck in traffic or to think.

[21] Walking trips included walks to and from public transport stops and from car parks to destinations as well as trips which were wholly conducted on foot.

Some parents remarked that children 'pestered' them to walk to school and on other local journeys because they have learnt about climate change at school and because some schools reward walking to school with badges and other incentives.

Barriers

One of the biggest barriers to walking is the weather. Perhaps not surprisingly, participants from all the lifestage groups were reluctant to walk in wet or cold weather and would use different modes of transport for the same journey depending on the weather.

> *"I think that the biggest thing for me is the weather. Not the cost, not the time, it's the weather. I would walk anywhere, I love walking but I hate walking in the rain and, like, if you've got to go to work, you can't turn up at work soaked, so you would just drive."*
> Younger People, female (meeting 3)

The **time required to walk discouraged** many from walking and we have seen how lack of time motivates people to travel by car. Indeed, several participants felt that they would like to walk more, but felt that they simply do not have the time. This did not seem to be specific to one particular type of journey, the school run, journeys to work and visits to friends, were all given as examples.

Concerns over **personal safety** also contributed to the **reluctance to walk**, although this was **more of an issue for women**. Several participants, particularly in the Middle Class Families and Less Affluent Younger Families lifestage groups, felt that it was not safe for them to walk after dark and there was concern about the lack of streetlights in some places. In particular, some in the Less Affluent Younger Families group felt that their own neighbourhoods were unsafe after dark. School walking buses were viewed positively by most parents although **a few women were concerned about 'stranger danger'** and said they would not let their children take part.

The **need to carry bags**, whether shopping or luggage, was **another barrier** to walking.

6.1.3.2 Cycling

Cycling accounted for a very small proportion of all trips and accounted for 1.3% of all distance travelled initially. The number of trips by bicycle fell over the course of the study but, due to the overall fall in the number of trips made, the proportion of trips made by bicycle rose slightly. Those who reduced their carbon consumption, on average, did not increase the number of cycle trips so it seems that **increased cycling has not been a major feature in the carbon reduction observed.**

Educated Professionals initially had the highest proportion of trips by bicycle (5%). Younger People reported a very limited cycle use in the first travel diary. Less Affluent Mature Families reported no cycling at all in either the entry or exit diaries. Interestingly, the follow-up telephone interviews identified that one participant from this group has adopted cycling as a significant form of transport since the start of the research, which may indicate that some of the impacts of the information from the project will emerge over longer timescales than the project has been able to monitor as people identify situations where change is possible (for example, change in job location) and where motivations to change increase (for example, rising fuel prices).

Similar seasonal effects to those observed for walking also emerged, although these were less pronounced.

Motivators

Across three of the lifestage groups – Educated Professionals, Middle Class Families and Less Affluent Mature Families, motivations to cycle were quite similar. Participants considered cycling, like walking, to be a **healthy option**, with several observing that it could help improve fitness and get fresh air. These groups lived in and around large towns rather than in very urban conurbations.

For some journeys, particularly to city centres **where traffic was likely, saving time was a motivator for cycling**. For some, it was quicker to cycle than to travel by car or bus. Similarly, in town centres cycling can be more convenient than driving because it can be possible to get physically closer to a destination on a bicycle than in a car and **parking is generally easier and free.**

Specific incentives can also encourage people to cycle. Participants from Less Affluent Younger Families mentioned a free breakfast at their children's school as a motivating factor in their decision to cycle with their children to school. While the sustainability of such incentives can be an issue, this is not inevitably the case; one participant noted that once she had got into the habit of cycling for a specific journey (taking her children to school), it was easier to continue.

As with walking, although almost carbon free as a mode of transport, environmental reasons for travelling by bike did not feature as a motivator, although a small number of people were prepared to try cycling as a pro-environmental solution even if this was largely linked to other potential benefits to them.

Barriers

As with walking, one of the **main barriers to cycling was the weather** and a spell of bad weather could break the habit of cycling. Despite the recognition of health and other benefits, people do not want to cycle in cold or wet weather. Indeed, a number of participants specifically noted that they would cycle unless the weather was bad, in which case they would use a car or public transport.

Safety concerns were another significant barrier to cycling. Personal safety (that is, concerns about being attacked) was not as big of a barrier for cycling as for walking, but **road safety concerns were considerable**. Roads are not viewed as safe for cyclists (and this is exacerbated in the dark) and some participants were deterred – or *"petrified"* – by *"reckless"* drivers and in some cases the state of the road or cycle track surface.

Several participants commented on the **lack of infrastructure to support cycling**, particularly the lack and nature of cycle lanes. However, purchase cost was never raised as a barrier, indeed, many participants seemed to own bicycles. Many roads were said to have either no cycle lanes or only intermittently. Cycle lanes that physically separate cyclists from motor traffic by a curb or bollards (shown in the 'Transport Best Practice' presentation) were particularly popular as all participants thought that this would be safer for cyclists.

Cycling to work was generally seen as impractical, if technically available and feasible. For the participants arriving at work looking dishevelled and needing to wash and change was a deterrent. It was suggested that employers could do more to encourage cycling to work by providing shower facilities.

Bike theft was also a barrier to cycling and was a problem for some Educated Professionals who cycled to the station as part of their journey to work, as well as for Middle Class Families and Younger People, when cycling to undertake local errands and for pleasure.

As with walking, when people needed to carry luggage or travel with others – especially children – they were unlikely to choose to cycle.

The barriers to cycle use appear to be significant as while over one-third of participants said that cycling was available to them as an option for some journeys, cycling overall did not increase very much during the project.

6.1.4 Air travel

Flying is primarily an option for holiday travel or business trips and it was not covered in depth during the project, which focused on regular trips. (See CfIT (2007) and Defra (2008) for research exploring in more depth public attitudes to air travel and the environment.) Nevertheless, it arose in the discussions, mainly in the context of holidays, as from the travel diaries we know that few participants flew on business. Indeed, not all flew for holidays because they said that they could not afford to do so.

Motivators
Across all the lifestage groups there was a reluctance to give up foreign holidays. Participants' decisions to fly to foreign holiday destinations seemed to be primarily determined by the **weather, cost, convenience and the desire to explore foreign destinations** which could not be reached by other means in the space of a two or three week holiday period. Participants perceived holidays in the UK as often being significantly more expensive than holidays abroad. The discussions revealed some willingness to take holidays in the UK rather than abroad, especially among the Less Affluent Mature Families. However, holidays in the UK were often taken as second holidays with the main family holiday being taken abroad, primarily because of the weather. There was some **resentment about being asked not to fly for an annual holiday** when it was perceived that *"celebrities and the rich"* do so all the time.

> *"Does this mean like, in so many years time we've just gotta stay in this country because we're made to feel guilty about going on holiday?"*
> Less Affluent Younger Families, female (meeting 5)

The discussions revealed some willingness to replace domestic and European flights with other forms of transport and some did so during the project, stimulated by taking part in the project. One participant asked whether driving with four people to ski in France was a lower carbon option than a fly-drive holiday. Although this information is available on the Internet they were not aware of how to find it. The third meeting was close to summer holiday time and the Less Affluent Younger Families took the opportunity to explore the best way to travel to France with their family on holiday with the presenter of the Personal Actions presentation. However, using boat and car or rail to reach a foreign

holiday destination can increase journey time and costs. This research has found that individuals will take these factors into account in their decision-making and they may act as a motivator to flying, depending on the purpose of the trip. Participants reported that flying is often, although not always, less expensive than some other options, such as taking a train within the UK and, via the channel tunnel, to Europe.

Those who flew on business said that they usually had no choice over their mode of transport. Time and cost mean that some companies insisted that their employees fly, even if other options are available.

Barriers
Flying has become a habit for many, especially the better off and some lower income people without children, but participants mentioned a number of specific barriers that discourage them from flying.

Cost can be a barrier to parents choosing to fly on family holidays during school holidays, when prices are higher than at other times.

Flying can be inconvenient in certain circumstances, for example, if other options are available and the airport is not close to the final destination. We also found that some parents are reluctant to fly with children, in case of delays at the airport, which can be difficult to manage.

Foreign holidays are aspirational and few who could afford to fly said they would regularly choose not to do so. However, there were some individuals who were interested in how to travel abroad with the lowest carbon emissions and at the margins some might not fly *every* year because of environmental concerns.

6.2 Vehicle/fuel selection

6.2.1 Using different types of fuels

There was a general lack of understanding about different types of fuels. Most participants were aware of diesel, standard unleaded and super unleaded petrol because they had seen these at petrol station pumps. A smaller number had heard about LPG and biofuels, some were also aware of clean diesel. However, generally they did not understand the differences between these fuels and they tended to lump LPG and biofuels together as new and largely unavailable. Most participants with petrol cars bought standard unleaded fuel because it was the cheapest at the pump. Electric cars were well known as a concept but not considered to be mainstream. Hydrogen fuel was known only to a minority.

Motivators
Some men in all the lifestage groups were aware that super unleaded and cleaner diesel, although more expensive than standard unleaded and diesel, reduced running costs by cleaning the engine and thereby maintaining engine efficiency and making fuel consumption lower than it would be with standard fuels.

Barriers

The lack of understanding of different fuel types, discussed above, was the **major barrier** to their wider up-take. Participants perceived that 'greener' fuels were unlikely to be available universally and believed them to be prohibitively expensive. Indeed, some thought using them would require converting their car's engine, which would further increase the cost. We did not explore each fuel type in detail and it was clear that on the whole participants were very confused about the nature of different fuels.

The barriers to using anything other than the cheapest fuel suited to their engine were the cost at the pump and the lack of understanding of the benefits derived from more expensive fuels. Many participants, especially women, thought that the more expensive fuels were designed to make cars go faster or to have faster acceleration. To many this additional performance was not worth the additional cost.

Concerns about the effects of using 'greener' fuels such as whether it would invalidate a car warranty were also expressed.

6.2.2 Purchasing a more fuel efficient vehicle

Motivators

Several participants purchased new, lower emission, cars as a result of the information in the second meeting. While for most this was part of a general need to replace a car, a couple in the Educated Professionals and one from the Less Affluent Younger Families, took this action specifically as a result of participation in the project. Another wanted to reduce emissions before the project and the information had provided the extra motivation. Yet another participant said they had looked at the level of carbon emissions of different cars before deciding on the best car because of the information provided in the meetings.

> *"That was a direct response to this…undoubtedly…It was the pollution factor added to the economics…the two things together."*
> Less Affluent Younger Families, male (meeting 4)

More generally, there was some mention that buying a more fuel efficient car would yield an economic benefit, but this was not driven by a desire to reduce carbon. Participants did not explicitly link fuel efficiency with reduced CO_2 emissions, although it was obvious to them when pointed out.

> *"I did buy a new car since the last time and the only thing I asked about was how much does it cost to get a full tank, does it last a while, not really about fuel emissions, and the reason why I chose it was because it was what I could afford."*
> Younger People, female (meeting 5)

Participants noted other possible cost savings, such as a significantly reduced road tax and, for London, the exemption from the congestion charge.

Barriers

On the whole, participants did not base their choice of car on carbon emissions; **factors such as cost of the vehicle, running costs (miles per gallon, parts and general maintenance costs) and the attractiveness of the car were seen as more important**. They also did not discuss buying a smaller engine within the car class.

With respect to **hybrid cars**, the **initial purchase price** was a concern for many. Even if there were savings on petrol costs, hybrid vehicles were perceived to be quite expensive and only available to the better-off, despite savings on running costs. Moreover, we have seen in section 3.3.2 that the majority of cars are bought second-hand and participants believed that these cars were so new on the market that there were unlikely to be many yet available second-hand.

Moreover, **a few were unconvinced that there would be lifetime carbon savings from hybrid vehicles**. There were discussions about the carbon consumed during vehicle lifecycles and the need to take into account the carbon consumed during production and in scrapping older cars while they were still roadworthy.

Lower emitting cars tended to be seen as physically smaller and there were some **concerns about the safety of physically small cars**. Indeed, one participant who purchased a smaller car between the third and fourth meetings had reverted to a larger car by the fifth meeting because of the safety concerns of a relative. This perceived additional safety of bigger cars contributes to some participants' motivations to purchase four-by-four and other large vehicles, although some said they have these cars because they need to carry several children or work equipment.

More generally, car purchase is driven by what may be termed emotional factors. While what is appealing varies from consumer to consumer, many choose to buy cars that they find ‘cool’, attractive or a status symbol, as found elsewhere (MORI, 2003).

6.2.3 Giving up a car

Across all participants the average number of cars per household was 1.7 and there was no change in this during the project. Those who owned more than one car and who might consider giving up a car considered that they would be more likely to give up the smaller car. This was mainly discussed by the Educated Professionals where those who were retired, or who had several children who were able to drive, felt they could manage with one or two cars, rather than with two or three.

Motivators

The main motivator to give up a car was cost but environmental considerations can come into play for those already interested in environmental issues. Moreover, if car usage can be reduced significantly, one car may become redundant. This issue was difficult to explore within a one-year timescale as such decisions were typically considered much less frequently. It is however, worth remembering that there will always be a small number of people who are considering whether to reduce their car ownership.

Barriers

The main barrier is lack of flexibility. Individual household members would need to co-ordinate their travel and give up the autonomy of having their own car or easy access to one.

6.3 Car use behaviours

6.3.1 Driving more efficiently

During the course of the project, participants heard a presentation with recommendations about how to drive more efficiently, including driving more slowly or keeping revs down, keeping tyres fully inflated and removing unnecessary weight from their vehicle. These behaviours are drawn from the Government's current Act On CO2 campaign. Participants perceived these actions as akin to turning a TV off rather than using stand-by; a slight inconvenience but one which has no impact on the main activity in question (TV watching or travel). **Participants who drove regularly and who felt that they had no alternative were willing to try to drive in a way that reduced their fuel usage and thus their carbon dioxide emissions.**

Motivators

The motivating factors to driving more efficiently were **cost savings** and a feeling among participants that they should try something as part of the project. Importantly, some participants (mainly men) noticed that their fuel consumption reduced as a result of driving more efficiently, a benefit that is likely to act as a motivator for others as well.

Watching the revs to keep below a certain limit was something of a 'game' or challenge for some that acted as a motivator to keep revs within a certain bracket. This was one of the key pieces of information remembered by some and was said to be maintained throughout the project.

Barriers

In contrast, some individuals felt that they had not noticed a saving in petrol as a result of driving more efficiently. While this did not discourage them completely, the lack of apparent benefits may make this behaviour harder to sustain.

For some, the perceived extra time required for journeys as a result of driving more slowly to reduce petrol consumption acted as a disincentive to doing so. Most participants knew that driving at 50 miles per hour rather than at 70 consumed less petrol.

A final barrier, apparently primarily related to keeping the tyres optimally inflated, is simply remembering to do so.

6.3.2 Car sharing

Only the Less Affluent Younger Families recorded a substantial reduction in the percentage of trips made alone by car and van; this was the result of conscious decisions made by some members of the group. However, members of other groups also reported trying to increase car sharing, for example for the school run and leisure trips such as trips to the gym.

Motivators

Costs were a **primary incentive for car sharing.** Reduced and/or shared petrol costs were easily viewed and accepted as a benefit of car sharing**.** Participants who had tried it for commuting to work, going to regular events with friends, or to transport children, found that it did cut costs significantly. Moreover, they did not find it inconvenient and may find it relatively easy to sustain for these journeys.

No one used formal car share schemes. Nevertheless, company supported car-sharing schemes were well regarded because they could potentially overcome some of the barriers and concerns about car sharing discussed below. Indeed it was suggested that companies could do more to offer financial incentives to employees to car share for commuting. Some participants reported that their employers had restricted car parking to encourage car sharing and one Middle Class Families male said that his company helped employees to find car share partners, although he was not involved.

Barriers
While car sharing was considered to be a good idea generally, it was also seen as **difficult** to organise and as something that would work **better for particular leisure trips** when the time pressures are less, than for commuting to work. Finding other individuals who live and work in the same locations, which makes car sharing feasible, was said to be a challenge. **Car sharing** for journeys to work is made more complicated by different starting and finishing times. Moreover, it was seen as **working against trip-chaining** where people might make other stops, for example to collect or drop-off children or do shopping, on the way.

Organised public schemes, such as local websites that allow individuals to match-up journeys to car share were covered in one of the presentations but **were not favoured**. A number of participants said that they would **not feel safe making a journey with a stranger** found through a website. **Schemes organised by employers were potentially popular** because **participants felt safer travelling with a colleague** than with a stranger found via the Internet.

6.3.3 Car clubs

Car clubs were not familiar to participants. Joining a car club where drivers have shared access to vehicles and are charged an hourly rate for their use, would enable individuals to give up their car and nationally these schemes are spreading. Car clubs were only available at a limited number of sites at the time of the study.

Motivators
The main motivator as perceived by participants was that individuals would be able to give up their car and thereby **save money**. However, the barriers discussed below are significant and for some insurmountable. This meant that car clubs were not discussed in much depth because they were **dismissed as unsuitable** by the vast majority of participants for their personal circumstances.

Barriers
The main barrier identified by participants was **availability**. While participants felt that car clubs might work well in densely populated urban areas (such as inner London), they were thought to be **less attractive in suburban and rural areas because cars would be less likely to be available close-by.**

Moreover, participants were not convinced that there would always be a car close to where they needed it at the time they needed it. Those who relied heavily on their car as their main means of transport did not see car clubs as a feasible option. It may be that this would be an option for second cars in households but this was not raised by participants.

6.3.4 Park and Ride schemes

Park and Ride schemes offer an option between taking public transport for an entire journey and driving all the way. They were supported by many participants but awareness of local schemes may have been low because usage was limited.

Motivators

Park and Ride schemes were **appealing** for a number of reasons, primarily **cost and convenience**. The parking was considered to be relatively secure and cheap compared with city centre parking. In addition, the bus fare into town was said to be considerably less than taking a regular bus. So, overall, these schemes were considered to be good value for money.

Participants also thought that using Park and Ride schemes were convenient, because they did not have to find parking in the city centre and the bus into town is scheduled to run frequently. An additional benefit of these schemes is that they are seen to reduce congestion in city centres.

Barriers

There are **few barriers to using Park and Ride schemes**, besides the obvious ones of availability and awareness. Park and Ride schemes were less likely to be used if they are not well organised; for example, some participants were reluctant to use them because they considered the buses to be infrequent.

Bad weather and travelling with children can also act as a deterrent, as can having a lot of shopping which could be taken back to a car parked in a city centre car park between shops.

6.4 Trip reduction

Participants considered a number of ways to reduce their need to travel but a combination of external barriers (for instance, acceptability to employers of home working) and lifestyle considerations (for example, shopping as a leisure activity) presented challenges for behaviour change, resulting in trip-chaining being the most preferred option.

6.4.1 Trip-chaining

Trip-chaining requires planning journeys that incorporate a number of purposes, such as doing the shopping and picking-up children on the way home from work.

Motivators

Generally, **trip-chaining was seen as convenient and easy** and although the perceived feasibility of trip-chaining did not seem to increase, reported trip-chaining increased and there was a significant reduction in the number of trips recorded between the entry and exit travel diaries. Participants themselves recognised a number of benefits from trip-chaining. A few participants remarked that this had been the only action that they had been able to implement.

Reasons for trip-chaining were quite straightforward: it provided **savings of both time and money** – the two most precious commodities with respect to deciding how to travel. Trip-chaining was regarded as a good, and easy, way to save money, and a few participants had noticed saving on petrol costs. Although planning trips took more time,

the time spent planning was more than made up for by the time saved overall. This was true across all lifestage groups.

Participants were asked to discuss topics raised in the discussion with friends and family. Earlier we discussed that they found it difficult to engage people but because trip-chaining is a relatively easy thing to do, some participants also found that they were able to influence friends to do it.

Barriers
No one specifically mentioned any barriers to trip-chaining because everyone thought it was a good idea and one that they could implement relatively easily. Nevertheless, some participants found **organising or consolidating journeys** to be **difficult**, especially when children were involved because **children could become irritable** or bored and want to go home before all the tasks had been completed.

The follow-up telephone interviews revealed that it was **difficult for some people to maintain** because of the planning required. This is a characteristic of the group we identified in chapter 5 above, who would like to change but who feel that they have other, more important, priorities. The level of planning required means that those who are not well organised or who have a lot of domestic responsibilities (for example, lone parents) found it particularly difficult, despite recognising the potential cost and time savings.

Infrequent drivers found trip-chaining more difficult, probably because of their reliance on public transport. Public transport routes might limit participants' ability to combine trips in the way a car driver can because of the radial nature of public transport.

6.4.2 Working at home

The option of working at home or teleworking was also considered as a way of reducing carbon dioxide emissions (see Cairns et al., 2004 for more detail on teleworking, including attitudes, motivations and factors influencing the feasibility of teleworking). Generally participants **perceived the option of working at home as limited** (only a handful of participants had a job where it might be possible) and **even fewer thought it was feasible for them**, either because their employer was not supportive or because they felt that they had roles which required them to be in the office.

Motivators
When it is possible, the option was appealing to some participants, particularly because it **avoided commuting** (which was seen as uncomfortable, inconvenient and tiring) and was convenient for parents who need to accommodate children's schedules.

An Educated Professional pointed out that working at home just one day a week would produce a 20% reduction in transport-related emissions. This made others in the group realise that a small behavioural change could have a relatively big impact.

Barriers
Participants perceived substantial barriers to working at home that result from the nature of employment and the degree to which home working is encouraged by an employer. For **some types of work**, such as building, teaching, child care or customer services the nature of the job **does not permit working at home**. In other cases, particular resources

(for example, technology or other employer-based systems) are not accessible off employers' premises.

Some employers' policies do not allow individuals to work from home and some participants thought that this represented a **lack of trust between employers and employees**. The more senior staff in the Educated Professionals and Middle Class Families lifestage groups reported that they would find it difficult to work at home on a regular basis because of the **need to be available** to junior staff to answer questions and attend meetings. However, one member of the Middle Class Families group reported successfully using videoconferencing to reduce the need to travel to London to meetings as a result of taking part in this project.

These findings are consistent with other DfT research exploring teleworking in more detail (Penfold et al, 2009).

6.4.3 Internet shopping

In all the lifestage groups we found some participants who had already adopted Internet shopping enthusiastically and who were active proponents before becoming involved in the project. Others had tried it and did not like it and others had yet to try it.

Importantly, different individuals would use Internet shopping for different types of goods[22]. On the whole, the perceived availability and feasibility of Internet shopping increased sharply over the course of the project reflecting a greater awareness and acceptance of this as a potential option.

Motivators

Some participants already shopped on the Internet. However, **many only shopped online for particular types of goods**, such as tinned or boxed items of food (such as baked beans and cleaning products), clothing, electrical goods and gifts, preferring to select fresh food (mainly fruit and vegetables) themselves. Nevertheless, many participants were willing to try Internet shopping for food as part of the project. However, not all of those who said they would try it actually did so. Again this was something participants thought would be easy to try, and some stuck with it. Participants were motivated to shop online for a number of reasons.

For groceries, some participants reported that Internet shopping can be cheaper than visiting a supermarket despite any delivery charge. Some individuals found that they were more disciplined and stuck to their list when they shopped online, as the temptations to pick-up other items were reduced. **Free delivery was also an incentive** and we were told that supermarkets frequently have free delivery offers. Indeed, it was considered that comparing online offers between supermarkets can yield cost savings as does the ability to compare prices online. The convenience of not having to travel to the supermarket and of being able to choose delivery time was valued. However, **many were still travelling to the supermarket for fresh items** – especially fruit and vegetables – **potentially increasing carbon dioxide emissions overall**.

[22] About a third of the population in the UK has no access to the internet *Source:* RCUK/DIUS (2008) *Public attitudes to science 2008*. TNS/PSP. However, this was only true of three out of 131 of the participants.

Some felt that shopping online saved time and by using price comparison sites or visiting a number of different sites, it is possible, and convenient, to find the best price for purchases quickly and easily.

For some, buying clothes on the Internet was seen as convenient because it is possible to try on clothes at home and then simply send back things that do not fit.

Many simply found Internet shopping easy to do and easier than they had anticipated, which encouraged them to continue shopping online.

Barriers

Although there were many incentives to shop online, there are also a number of reasons why people chose not to.

When the experience of shopping online fell short of expectations, participants were more reluctant to continue with Internet shopping. Damaged items, inappropriate substitutions when an ordered item was unavailable and late arrival of deliveries were particularly off-putting. Delivery charges discouraged shopping online, as did the inability to get a convenient time slot for delivery.

For others, Internet shopping was not the way they preferred to shop. For many, it is both important and satisfying to see the products prior to purchase. This was particularly the case for perishable goods like fruit and vegetables, because selecting these items personally offers more control. One participant specifically mentioned wanting to select items that had the most distant sell-by date, others wanted to select ripe fruit, while others preferred to buy less ripe fruit for consumption later in the week. Some participants preferred to do all of their food shopping in person because they wanted to browse (for example, for meal inspiration or to remind them what they need to purchase). Others simply enjoyed the experience of shopping.

For some, the need to send items back was inconvenient and this resulted in a preference for buying clothes and goods such as electrical equipment, in shops. As with food, some participants preferred to actually see the goods, rather than to select them from a website and so rejected Internet shopping for these items. However, **rejection of Internet shopping for some purchases did not mean rejection for all categories of goods**.

Some participants **believed that carbon savings from shopping online were likely to be insignificant**, particularly compared with the carbon dioxide emissions that some of the food had generated prior to purchase, especially food that is flown into the UK. Others questioned whether online shopping really resulted in any reduction overall. They believed that if delivery vehicles from a number of different supermarkets had to visit the same street several times a day, more, not less, carbon would be consumed than if everyone drove to the supermarket. Though this is unlikely it is difficult to establish the carbon savings from home delivery due to the varying practices of different suppliers (Roper, 2006). The apparent acceptability of Internet shopping combined with the apparent uncertainty over its benefits suggests this to be an important information gap to close if this is to be coherently marketed as a pro-environmental behaviour.

6.4.4 Using local shops and services

Conversations about using local shops focused entirely on food shopping. Some participants understood local shops as those close to where they live and for some this included a supermarket. Others understood local shops as small independent shops. Almost 60% of participants considered local shops to be available and some already shopped locally. Perceived availability increased over the course of the project to nearly 70%, which resulted in feasibility increasing as well. This is presumably because the project raised awareness of the shops, not a result of an increase in the number of shops or as a result of house moves. Younger People (who in our sample lived in the outer suburbs of Leeds) were more likely to shop locally, perhaps because they were less likely to have cars. The Educated Professionals and Middle Class Families were the least likely to shop locally.

Motivators

Participants were generally quite enthusiastic about using local shops. Some participants chose to shop locally because they wanted to support local businesses. Local shops were often said to be convenient and walking is a more possible mode of transport.

Buying produce from local shops, defined as 'not a supermarket' was said to result in a healthier diet because participants reportedly bought less pre-prepared food and more fresh produce. Similarly, shopping in small independent shops was said to result in cost savings. Even though individual products were often perceived to be more expensive, participants said that they were able to buy only the amount they needed, rather than having to buy large packs, thus reducing the total cost. This also meant that less food was wasted. The motivators are not CO_2 reductions or other environmental considerations, although the outcomes (fewer car trips and potentially less wasted food) do benefit the environment.

Barriers

Despite enthusiasm for shopping locally, some participants encountered barriers to doing so. It was perceived that local shops do not have special price offers as supermarkets do and many said they were more expensive than supermarkets generally. The limited range of items said to be available in local shops was perceived as less convenient by some, who preferred going to a single shop where they could buy everything they needed in one place.

6.4.5 Buying local produce

Related to the option of using local shops and services is that of buying locally produced food. For some this meant from within a few miles radius, while for others it means from within the UK or the EU. While buying local food does not necessarily impact on transport choices, it can reduce travel-related carbon consumption because food has travelled a shorter distance to the shop. Taking part in the project raised awareness of this issue; some participants had never considered the origin of their food. Again there was considerable enthusiasm for this, although less than for using local shops. The 20-29 year olds were significantly less likely to consider buying locally produced food compared with other age groups; they were more likely only to consider whether they wanted the item.

Motivators
The primary motivators for purchasing very local produce are taste and quality and some were willing to pay more for this.

Some participants from all the lifestage groups had also begun to consider where food comes from when making purchasing decisions in the supermarket and were inclined to choose food that was local or at least from Britain (or the EU) rather than food that has come from more distant locations. The main motivation was better quality, only one or two Educated Professionals considered reducing the distance food had travelled when making purchasing decisions.

Barriers
For many, a farmers' market is the main available option for purchasing very local produce. However, some farmers' markets are not open at convenient times, and participants perceived them as expensive.

Others had tried box schemes, in which fairly local fruit and vegetables are delivered, but these do not offer choice over the contents and many participants wanted to have a choice over what they buy and eat. In addition, others were accustomed to buying some food items year-round, including when out of season in the UK.

The conflict between buying local food and supporting developing nations was also mentioned briefly. Some felt they were *"doing their bit"* to support developing countries by buying fair trade produce which is often flown in to the UK. They were aware that this is in conflict with reducing the distance food travels and felt that it was unclear which action was best. If food miles are an important part of reducing CO_2 emissions then, as with home shopping, there is a substantial information gap to close.

6.5 Offsetting

Although not a measure in itself to reduce CO2 emissions from travel behaviour, offsetting and offsetting schemes were explored in the context of an option where behavioural change to reduce emissions was not considered possible. **Awareness and understanding of offsetting schemes at the start of the project was minimal**, although a few had heard about it in each lifestage group.

Motivators
The only reason offered for trying offsetting was guilt about flying and the carbon dioxide emissions produced by aircraft.

> *"I won't stop flying but I use the carbon offsetting websites. I've only done it because I feel guilty because of this* [information received during research] *that's one effect it's had!"*
> Less Affluent Mature Families, female (meeting 5)

Barriers
There seemed to be a number of reasons why participants did not offset their flights, but one of the most significant was a general lack of awareness and understanding of the principle and how to go about it.

> *"What's that mean again? I haven't done that. How do you do that? I think if it was an option, the last flight I booked on the Internet, I didn't see that* [offsetting] *as an option. I guess it would depend on how much money they offered for it."*
> Younger People, female (meeting 5)

A related barrier is that individuals were **not convinced of the effectiveness** of these schemes in actually offsetting carbon dioxide emissions. Some were suspicious of the motives of the companies' organising the schemes. There was some negative coverage in the press about some of these schemes during the project, which may have influenced opinions. Moreover, the presentation on potential actions to reduce carbon consumption was not supportive of offsetting. Some participants felt it might be better to spend the same amount of money planting in their own gardens.

A few individuals felt that they did not fly frequently enough to make offsetting really worthwhile.

There was also a general concern that offsetting does not change attitudes towards flying; it merely **makes people complacent** and allows businesses and the better off to continue flying.

6.6 Summary and conclusions

The findings of the research suggest that **behaviour changes that people are prepared to undertake** are those that are practical and consistent with their attitudes and lifestyles and which therefore **do not inconvenience them**, at least not significantly. It is also very clear that the **traditional motivators and barriers to changing travel behaviours are strong relative to the additional motivation of tackling climate change**.

On the whole, people seemed **most willing to make changes where the actions they took had other personal benefits** (for example, cost or time savings, the freshness of local produce or the health benefits of walking). **Reducing carbon dioxide emission was generally seen as a 'spin-off' benefit rather than a core driver of behaviour change.**

Chapter 4 identified that information about climate change can be effective in increasing the strength of the relationship between attitudes to climate change and intentions to reduce car use. There we reported that feelings of responsibility and control are important in defining whether people intend to cut their car use. The evidence presented in chapter 3 suggests that this is further tempered by whether or not people believe that climate change is accelerated by human activity and that their personal behaviour is important to the problem. On top of this is **a complex mix of barriers and motivators** identified in chapters 5 and 6, which are **in part linked to lifestyles and aspirations and which help to explain why the gap between intentions and actual travel behaviour change is so large and poorly understood.**

This analysis highlights several areas where **greater awareness of actions that individuals can take** to reduce carbon consumption is needed to change behaviour. These are:

- **efficient-driving techniques and trip-chaining**, most of which also save money, and which are easy to incorporate into day-to-day life;
- **greater awareness** of the level of the **financial savings** from **reduced car use**;
- the **health benefits of walking and cycling**, which people seemed amenable to trying, at least in some circumstances (for example in good weather and for local journeys); and
- **travel options websites**; their use is not embedded in day-to-day life and many are unaware that they exist.

Greater understanding of some issues could also support consideration of behaviour change, especially:

- **cleaner fuels**, which currently we found few understood. There is also a **lack of confidence in their effectiveness and their availability**;
- **Internet shopping.** While **some were enthusiastic**, **others questioned the climate change benefits** because of the perceived delivery patterns;
- what **employers** could do to **encourage and facilitate car sharing** and **home working**;
- **food miles** were **poorly understood** and those who want to support developing countries may not consider this; and
- **carbon offsetting schemes** were **poorly understood.** These need to be accredited and publicised, if not widely then at the point of ticket purchase.

All communication messages need to make it clear how easy and cheap it can be to take action.

7 Information and Its Impact

7.1 Introduction

Anable et al (2006) concluded that information is a necessary, though not sufficient, component in influencing personal travel behaviour. This section further explores the role of information (especially scientific information) in terms of perceived information needs, perceptions of information received and its impact on awareness, understanding and attitudes towards travel behaviour and climate change.

Key Findings:

- Providing information will stimulate some to think about the link between transport and climate change but will not be enough to stimulate action for most.
- Misconceptions exist which could potentially reduce the willingness of some people to consider behaviour change.
- Key pieces of information for the participants were:
  - that climate change is resulting from human activity;
  - the speed at which climate change is happening;
  - the relative contribution of different sectors to climate change; and
  - the impact individual action can make.
- Scientists were the most trusted communicators.
- Government actions were not clearly understood.
- Any information campaign needs to emphasise the following:
  - the ease of making small changes; and
  - the benefits, especially financial, to individuals of making these changes.

7.2 Awareness of information sources

As mentioned in chapter 3 the initial questionnaire found that participants had heard about climate change via all the traditional national media sources, both press and terrestrial broadcast, and new media also played a role. The breadth of sources of information was reinforced by the findings from the discussion groups, which additionally revealed that participants had heard about the issue from family and local sources, such as church and local magazines.

The Recycle Now advertisements run by WRAP[23] with information about the impact on reducing emissions from recycling products were **recalled clearly** but the specific savings mentioned were not recalled. Similar information **on reducing emissions by changing travel behaviour was not recalled.**

By the final meeting, almost all of the participants reported being aware of more sources of information about climate change and perceived that it was more frequently covered in news media. In all of the groups, participants reported that to some degree they were both noticing, and engaging with, stories that they would have ignored before their participation in the project; in other words, they had become sensitised to the issue.

[23] WRAP helps individuals, businesses and local authorities to reduce waste and recycle more, making better use of resources and helping to tackle climate change. http://www.wrap.org.uk/

Some used conversations with friends and family members to check whether there really was more coverage and these participants reported that these conversations suggested that their perception of greater coverage was real. Additionally, participants in the Educated Professionals, Less Affluent Younger Families and Less Affluent Mature Families all reported noticing information about climate change in relation to commercial communications, for example product labelling and advertising. No strong views were reported on the value of this labelling, but the general mood of those who commented was that it was broadly helpful in making decisions on product purchases. 'Greenwashing', where consumers perceive that they are being misled by a company regarding its environmental practices or the environmental benefits of a product or service, was not reported. We also found no evidence that the level of coverage of green issues during the project was leading to apathy.

7.3 Use of information sources

Across the groups, participants highlighted the role of the Internet in providing access to information about climate change and the effect of travel. However, actual usage of the Internet in this way was not high. Participants were asked to explore four specific sites that provide information specifically to support informed choices with regard to travel. These websites were:

- http://www.dft.gov.uk/ActOnCO2/: providing advice on smarter driving and car purchasing
- http://actonco2.direct.gov.uk/index.html: a carbon footprint calculator
- http://www.direct.gov.uk/en/Environmentandgreenerliving/index.htm: providing information on greener travel
- http://www.transportdirect.info/: to help with journey planning

Only Educated Professionals and Less Affluent Younger Families tried these websites to any great degree, even though only three participants in total did not have access to the Internet through home or work.

Few participants had used journey planning sites to make a choice about the mode of transport they might use for a specific journey. In the Educated Professionals group the use of web-sites and satellite navigation systems to plan car journeys was mentioned, but the mode of transport had already been decided.

The response to the websites by the few participants who reviewed them was mixed. In the Less Affluent Younger Families group, the ACT ON CO_2 website was reported to be quite good, one participant reporting that it had provided "*hints about what I could do*". In the Middle Class Families group it was suggested that the websites could provide a useful tool to engage children through some of the interactive features. In the Less Affluent Mature Families group a participant noticed that conflicting advice between different sites was potentially confusing.

7.4 Trust

7.4.1 Government

The majority of participants were initially sceptical of Government and there was particular **suspicion that the Government was using climate change as a way to raise taxes**. This view was most prevalent amongst, but by no means limited to, those in the discussion groups who were more sceptical about the reality of climate change and the extent to which it was the result of human activity.

By the end of the project there was little change in this scepticism towards Government. Aside from the tax issue, there were concerns that Government was telling others to act, whilst doing little itself. On discovering that a number of Government departments were using hybrid vehicles, some participants thought that **more should be made of** this as **evidence that Government was acting**, which could add weight to its messages aimed at making others act.

7.4.2 Media

Participants were sceptical of the media and there was much talk of 'media hype' in all the groups. This was not simply in relation to climate change but most news stories were felt to be presented as shocking or a crisis. Within most groups at least some participants mentioned that the media were about selling stories. Selling could be simply selling copies of newspapers but selling the advertising space around television programmes was also mentioned. The Educated Professionals were more likely to mention the media's need for certainty as limiting its perceived ability or willingness to present a balance in relation to complex issues such as climate change.

7.4.3 Scientists/academics

There was some early scepticism over the role of scientists and the perception that they disagreed led to suggestions that scientists might be driven by their own agendas.

It was however, noticeable that **following participants' direct interaction with scientists, their trust in scientists grew**. The generally trustworthy image of scientists is in accord with findings from DfT omnibus surveys (2008), where independent scientists were found to be the most trusted source of information. [24]

As section 7.6.2 below shows, some of the most influential information was that provided in the climate change science presentation. Participants perceived scientists to be neutral, with no particular agenda, so their information made a lasting impression on many participants. **The opportunity for participants to interact directly with scientists was regarded as especially valuable** by the majority of participants.

7.5 Information needs

This study included an initial, general presentation on climate change and the impact of transport from a representative of the Institute for Transport Studies, University of Leeds. This was designed to stimulate discussion and questions. The session was structured so

[24] RCUK/DIUS (2008) shows that experience and academic credentials are the factors the public thinks are most important in determining whether to trust scientists.

that this discussion and the questions it raised would help participants to identify the information they felt they would need in order to be able to discuss climate change and how transport actions might make a difference. Requests for information and identified information needs fell into five broad headings, which were consistent across all of the five groups:

- the science of climate change;
- technological innovations for reducing the impact of transport on climate change;
- best practice in transport planning to increase cycling and the use of public transport;
- UK transport policy; and
- what individuals can do.

PSP and ITS worked with DfT to identify suitable experts to make presentations to participants and discuss information with them.

In addition, participants were provided with individual information on their personal CO_2 emissions based on their own travel diary (see 2.3.4).

7.6 Impact of information provision and deliberation

7.6.1 Changes in views

The results of this research have highlighted that information provision and deliberation, as enabled within the fieldwork, have influenced the views of participants (see section 3.2). An important reason for the increased concern reported elsewhere about climate change was a greater belief in the phenomenon, resulting from greater understanding, following the scientific presentation and subsequent deliberation. Moreover, in the fifth meetings, participants in all lifestage groups highlighted that the combination of information on the level of CO_2 in the atmosphere, and the rise in temperature since the start of the industrial revolution, was important in convincing them that global warming is occurring and that humans are having an impact. (See section 3.2.1 and appendix 1.)

7.6.2 Climate change information

In the later meetings, participants were asked what information had made the most impact on them and what they would say to influence other people's attitudes and behaviours. The scientific 'proof' about climate change had been important for the participants, but the environment within which it had been delivered was important. However, for wider dissemination the participants felt that messages needed to be simplified.

Key factors that could be included in any information programme to raise awareness of climate change were thought to be:

- evidence of scientific consensus;
- evidence of the existence of climate change; and
- evidence of the impact of climate change, in particular:
  - local impacts;
  - health impacts; and
  - other impacts to which the public can relate.

In terms of local impacts, participants meant genuinely local, such as what might happen to the flooding patterns of nearby rivers and major impacts on the UK that would affect the entire population. For a number of participants, climate change was expected to have a greater impact on today's children and highlighting this to parents was seen as an important communication tactic. A simple message that had resonated with some of the Younger People was a comment from one of the climate change scientist experts that if climate change followed some of the more radical models then "*Australia could become uninhabitable in 50 years*", that is, within their likely lifetimes.

There was a widespread belief, especially amongst female participants that any "*advertising*" about climate change needed to be "*shocking*". However, this needs to be considered against the findings of Anable et al (2006) which reported that people feel overwhelmed by shocking images and although it heightens their concern, it also reduces their willingness to take action. Indeed, many participants were aware that they themselves became immune to adverts, although there was a sense that this was not necessarily switching off from climate change, but rather that in general advertising needs to be refreshed in order to continue to have an impact. There was also an awareness that communication activity needs to use advertising professionals who could tailor messages to different audiences. Participants did not suggest how this might be achieved, but were aware that they were more engaged by advertising campaigns that evolved.

7.6.3 Information about individual actions

At the outset of the project, many participants did not believe that changing their behaviour would make a difference, yet by the end of the project many were making behavioural changes. In order to influence others to do the same, **the *participants* felt that any information campaign needed to emphasise the following:**

- **the ease of making small changes; and**
- **the benefits, especially financial, to individuals of making these changes.**

The importance of individual financial benefits associated with reducing fuel usage was highlighted across all the groups, although it was less of a feature in the conversations in the Less Affluent Younger Families group. In some of the other groups it was suggested that personal financial gain ought to be the principal message, rather than the potential for impact on climate change.

> "*It's economics first. If you tell people they're going to save money, they'll listen.*"
> Less Affluent Mature Families, female (meeting 5)

> "*Although I'm hugely sceptical about climate change being caused by human behaviour, I have become more efficient in the way that I drive my car.*"
> Less Affluent Mature Families, male (meeting 5)

In the Less Affluent Mature Families group the ease with which short car journeys could be cut out was emphasised, some referred to these as "*silly*" journeys that were only made by car because people did not think to do anything else.

In some of the groups, participants discussed ways in which individuals could be supported in making changes; one option mentioned in most groups was influencing

employers, particularly larger employers. In all groups, except the Less Affluent Younger Families, there were discussions about how employers could support less carbon intensive travel, by supporting shared transport to and from work and promoting working practices such as teleconferencing and home working. In the Educated Professionals group some participants had already noticed that this was happening and that travel reduction was being driven by cost savings. These working practices could therefore be promoted as economically beneficial to the employer, just as simple personal changes like eco-driving, trip-chaining and not driving small distances could have a financial benefit for individuals.

7.7 Conclusions

The information provided and deliberation facilitated during the project resulted in participants being more convinced that climate change is happening and that human actions have had an effect. However, direct interaction with an independent expert was particularly important for those who were more sceptical. This indicates that **providing information might stimulate some people to think about the link between transport and climate change. However, this alone will not be enough to stimulate behaviour change. For behaviour change to occur, individuals must believe that their actions will make a difference either globally or to their own well-being**. For many, simple financial savings will yield the latter with the savings of carbon a side-effect.

The following **information was referenced by participants and therefore appears to have been remembered:**

- **that climate change is resulting from human activity;**
- **the speed at which climate change is happening;**
- **the relative contribution of different sectors; and**
- **the impact individual action can make.**

While unable to recall detailed information, participants had taken away these main messages. Importantly, the second point should not be confused with an appreciation of the timescale over which impacts may be felt.

Participants voiced the importance of reducing carbon but **none based their transport choices on carbon emissions**. Linking information about climate change to other motivators such as health benefits and cost savings is likely to have greater resonance with the public as **very few people know how much carbon they use or the true benefits of one mode of transport over another**.

Information provision and deliberation has strengthened the relationship between feelings of responsibility and intention to change. In particular, information and discussions with experts convinced some participants who had been uncertain of the contributions of humans to climate change but it is unlikely to convert sceptics.

The presentations used in this project provided compelling evidence of the role of human activity in climate change, which could be developed further for use in communications activity.

At the outset, some participants believed that scientists do not agree on the causes of climate change. The discussions with the scientist drew out the level of agreement and this also had an impact on the willingness of participants to accept that human activity is causing climate change. Clearly the depth of interaction achieved during this project is not a viable option for a wider scale communication campaign. The important points of learning are, therefore, current perceptions and what information may be relevant to these perceptions. Two fundamental perceptions are, firstly, that scientists do not agree that human behaviour is influencing climate change, and secondly, that individual actions are irrelevant. This project has shown that both of these views can be changed.

A campaign that builds on simple messages underpinned by a simple 'call to action' might include the following key messages:

- the vast majority of scientists agree climate change is happening and that human activity has an impact on it;
- individual actions have an impact; and
- examples of Governmental actions and their impact.

Both personal and environmental gains need to be clearly identified. This message is consistent with planned activity within the Government's ACT ON CO2 campaign. The thrust of the content is about saving money, but visual representations highlight the effect on individual emissions of more efficient driving habits.

8 Conclusions and Implications

Drawing on the evidence in this report, here we present the conclusions of the research themed according to the original research objectives:

1) to explore public understanding of, and engagement with, climate change;
2) to identify and explore the barriers and incentives to behavioural change which could result in reduced impact of personal travel behaviour on climate change; and
3) to explore the role of information (especially scientific information) in improving public awareness, understanding of, and attitudes towards, travel behaviour and climate change and its potential for influencing behavioural change.

8.1 Public understanding of, and engagement with, climate change

Participants' initial ***awareness*** **of climate change was universal and** ***acceptance*** **that it is happening was almost universal**. **Fewer accepted that climate change is the result of human activity rather than part of natural variations.** Conflicting media reports and a perception that the scientific community is not united underlay this scepticism and disbelief although **scepticism diminished somewhat through interactions with experts** in the field. However, **scepticism that human activity contributes to climate change reduces individuals' willingness to take action**.

Despite widespread awareness and acceptance of climate change, **there was quite limited understanding of the causes of climate change,** across all lifestage groups. Few people, for example, were aware of what greenhouse gases are and the hole in the ozone layer was thought by some to be a cause of, or result of, climate change. This is important as a lack of understanding of the causes of the problem **may lead to a lack of understanding of the likely effectiveness of solutions**. If people do not know that carbon dioxide contributes to climate change, they will not understand why it needs to be reduced. Moreover, participants were aware that the hole in the ozone layer is reducing and this reduced their belief in the need for action.

Coupled with the lack of understanding of the causes of climate change was **a lack of understanding of the relative importance of transport as a source of climate change emissions and confusion over the relative importance of different modes of transport**.

Only half of the participants accepted that they personally contribute to climate change and this did not change significantly with the provision of information and access to experts. The belief that other sectors such as 'industry' outweigh individual contributions, or that other countries such as China, India and the US, consume so much more carbon than the UK, diminishes the sense of personal responsibility for the problem for some, while others believe that their personal consumption is too small to matter. Those in ABC1 socio-economic groups were more likely to accept that they had some personal responsibility for climate change than those in C2D groups, reflecting a mix of breadth of understanding of the issue, ability to act (for example, through greater flexibility in purchasing decisions) and the higher relative individual carbon consumption

of wealthier groups. This lack of understanding and acceptance that individuals personally contribute to climate change is a barrier to individual action.

The participants identified that **the impact of climate change would be greater outside the UK. There was also failure to take on board the relatively short timescale over which climate change is happening.** Both of these beliefs present further barriers to individual action by UK residents and participants suggested that much more could be done to make the likely impacts of climate change to their local areas real.

The research identified that **initially women were more concerned about climate change than men, but during the project, men became equally concerned.** This suggests that additional strategies to raise the profile of climate change for males might need to be considered. This is particularly important as, for many households, males were seen to be dominant in vehicle purchase decisions and which fuels to use.

Widespread awareness and acceptance does not necessarily mean widespread engagement and indeed, we found quite low levels of engagement at the start of the project. While there were those in all lifestage groups who had made changes to their domestic energy use, often many years ago, few had made changes to their travel patterns. However, all the lifestage groups included some individuals who had taken some transport-related actions such as walking and cycling for some trips and pumping-up car tyres.

8.2 Barriers and incentives to transport behaviour change

The key attitudes which define *intentions* to reduce car use were whether people feel some sense of personal responsibility to act to tackle climate change and the extent to which they felt they could act. Greater feelings of personal responsibility were expressed by the end of the project which suggests that it may be possible to influence the extent to which people feel they should act by providing information. Those who reduced their carbon consumption felt most strongly that they had some personal responsibility for the environment and felt the need to act to protect it and we found these individuals in all five lifestage groups. However, **other barriers to behaviour change mean that *actual* behaviour changes do not follow from intentions to change** regardless of stated willingness to change, which is in line with the observed attitude-behaviour gap**.**

Travel behaviour is primarily driven by cost and convenience with individuals striking a balance between these factors. Busy lifestyles place a premium on flexibility and the perception that the alternatives to the car are non-existent or slow, expensive and unpleasant, makes habitual car use the norm for many. Non-drivers and those with limited access to cars were generally more constrained in the types of behaviour changes they could consider due to the limited scope for change to less carbon intensive travel modes.

When considering alternative ways of making journeys the context in which a journey is made was important as well as the purpose of the journey. So, what governed decisions on which mode of transport to use were whether anything heavy needed to be carried, the importance of arriving on time, whether the journey was part of the activity or just

necessary to get to a specific event and whether children were travelling. Frequent journeys in particular need to be easy.

Our research encountered many of the well understood barriers to using different modes of transport (such as reliability of interchange, expensive and confusing ticketing and expensive parking) as well as known motivators (such as potentially faster journey times to city centres, freedom to read on a train and the health benefits of walking and cycling). The environmental impacts of journeys are a secondary concern to these primary issues in journey decisions, where considered at all. However, **climate change benefits might be an additional motivator to a change that participants might make for other reasons with personal benefits such as cost and time savings and health improvements the strongest motivators of change.**

People may be motivated to make changes to reduce their emissions even if they do not believe climate change is caused by human activity to improve air quality.

The implication of these findings is that it is necessary to identify win-win solutions which match the goals of travellers with those of cutting climate change.

The main behaviour changes which participants were prepared to undertake at least in the short-term can be summarised under three headings:

- **Reducing unnecessary trips**
  In particular participants saw opportunities to combine journeys and reduce the number of trips by planning better, particularly for shopping trips. Time savings to the individuals were identified as a clear benefit as well as some cost savings. However, some individuals may struggle to maintain this because of the planning needed.

- **'Localised living'**
  Participants were amenable to using more local facilities and shops when appropriate. Where more local facilities were available some participants were also amenable to sometimes walking and cycling, particularly in good weather and where good facilities exist to support the journey. This was seen to be healthy. However, carrying heavy bags and restricted product choice may mean this lifestyle is not maintained or used exclusively.

- **Being fuelwise**
  Even those drivers with little interest in climate change felt able to take actions such as removing unnecessary weight out from the boot, pumping-up car tyres and driving a bit more steadily. However, many took these actions because they were involved in the project and felt the need to try to do something. It will be important to demonstrate the savings this can generate to be effective with the wider public. The fuel savings were noted by some but not all.

On this basis our results suggest that **people seem more capable of, and amenable to, making adjustments to their trip patterns than changing the mode of transport they use.** Participants did not initially appreciate how many trips they made and they seemed to think more in terms of the activities to be completed, rather than the distance to be travelled. It is important to note that the participants were not generally able to estimate

their carbon consumption, which in any case means little to them. **The behaviour change activities that seem to be more acceptable have a range of benefits to individuals including financial, time, health and environmental and are perceived by participants as easy to incorporate within existing lifestyles.**

There is no social pressure to change travel patterns to reduce carbon consumption but neither is doing so perceived as socially unacceptable. Women were generally more willing and able to reduce car use than men but this did not vary with any other socio-economic characteristic. We identified a small but potentially important conflict between the aspirations of younger people in particular to own cars, grow incomes and travel further and their stated environmental concerns. Further work is needed to understand the different knowledge base and mind-set of younger people.

There is substantial confusion about other potentially carbon-reducing behaviours. For example, **very few people understood the benefits of different types of fuels** and whether they could actually use them in their car. They were generally therefore purchasing the cheapest familiar option. **There are clear opportunities to make the benefits of these different options more readily understandable to the general public.**

Very few participants were aware of energy rating labels on new cars although **most had heard of, or experienced, vehicle excise duty differentials**. This differential did not translate into explicit understanding of fuel consumption differences. Most participants were constrained by the sales price of second hand cars and what they can afford, even if running costs would be lower, because they do not have the initial capital to lay out. The number of passengers that can be carried, petrol costs and the cost of repairs were the most important considerations in car purchase with the look/style more important for those in the new car market. **More could be done to link VED and fuel consumption in people's minds.**

Whilst many people Internet shop for food and might be prepared to do more, there was a perception that lots of delivery vans driving around would not actually reduce overall CO_2 emissions. This combined with additional car journeys to shops for fresh produce may limit its effectiveness as a CO_2 reducing action. Carbon offsetting was not well understood, and even when explained it was treated with some degree of suspicion.

A lack of clear leadership was a barrier to change. For example, **workplaces were seen as not always taking the issue seriously** by, for example, not providing facilities for cyclists or not encouraging car sharing. At a national and local level the **absence of visible Government action acts as a barrier to individuals taking action. Initiatives which have been undertaken are generally not understood or known about whereas perceived tensions with the climate change agenda (such as expanding airports and high profile politicians making visits abroad) stood out.**

8.3 The role of information

Two main types of information can be considered important: information about the causes of climate change and information on how to take action.

8.3.1 Information on causes of climate change

Information on the causes of climate change will not have a substantial influence on people's motivations to change and will not, of itself, bring about behaviour change, (see section 8.1)**. It may**, however, **make the types of solutions that could be adopted seem more relevant and therefore remove potential barriers to change.**

Of the information that participants originally requested, only some of the scientific information was recalled by the end of the study. From the deliberations, the information that participants took on board, and which made an impact on behaviour, was that human activity is impacting on climate change and that individual actions could therefore have an impact. Conversely, an understanding that there has been variation in climate in the past suggests that variation is to be expected. The magnitude of the difference in the most recent cycle was not always noticed. The failure of this data to convince was at the root of the perceptions of the small number who remained sceptical.

Nevertheless, **many participants perceived changes in the weather in terms of seasonal variations and extreme weather over the last few years, and they believed these changes to be examples of the impact of climate change**.

Participants appear to trust scientists but direct contact with scientists and the ability to question them was an important factor in establishing their credibility. **Government** is not distrusted but **is viewed with extreme scepticism**.

The key pieces of information about the causes of climate change for the participants were:

- **that climate change is resulting from human activity;**
- **the speed at which climate change is happening;**
- **the relative contribution of different sectors to climate change; and**
- **the impact individual action can make.**

This research suggests that messages need to be simple and grounded in experiences which people can understand in a local and personal context. Media coverage of the problem had led to high levels of awareness but there was a low level of engagement amongst the participants prior to this project. More specific and tailored information gave participants a better understanding, and increased their engagement with climate change issues.

8.3.2 Information on actions to tackle climate change

In those cases where participants accepted that climate change is a problem, they were disappointed to learn that that there was no 'magic bullet' in terms of either personal actions or new technology to solve the problem. Information about the impact of carbon savings helped to put individual efforts into context and make them seem worthwhile. **Participants wanted specific information about the relative carbon savings of different actions**; for example, that walking two miles rather than driving is the equivalent of running a computer for ten minutes. **Few people were willing to go in search of information about environmental benefits** or use a carbon calculator, **despite acknowledging the potential usefulness of the information.**

Despite the confusion which exists over the causes of climate change, people may be motivated to make changes to reduce their emissions even if they do not believe climate change is caused by human activity. **The participants suggested that any information campaign needed to emphasise the following:**

- **the ease of making small changes; and**
- **the benefits, especially financial, to individuals of making these changes.**

A key message must be to communicate the contribution of transport to climate change and the impact of individual decisions. This is best done in relative terms (for example that walking one short journey a week is equivalent to turning a television off rather than putting it on standby). Participants for example, strongly recalled the "Recycle Now" campaign where the benefits of recycling bottles were communicated in terms of how long different household appliances could be powered by the energy saved.

To get maximum impact from encouraging behaviour change, climate change should be built-in to other messages – 'save money', 'be healthy' – measures which have these synergies are more likely to be appealing and stimulate action. **Almost everyone related to the concept of saving money**.

In the short term, messages might usefully focus around the three behaviour changes which seem most likely to be successful: **reducing unnecessary journeys, living more locally and driving more efficiently. There are also some key options** for reducing carbon use **which are poorly understood.** These include the benefits of different fuels, vehicle efficiency and the benefits of home shopping. If these are to make a contribution to reducing carbon dioxide emissions, people need to be convinced of the benefits.

Even with the intensive nature of this deliberative research study we only observed a reduction in the number of trips made, not the carbon consumed. Whilst our follow-up telephone interviews indicated that some behaviour changes occurred over a longer time period, others lapsed. This confirms existing evidence that **information on its own is unlikely to be sufficient to make a substantial contribution to cutting carbon consumption.**

8.4 Typology of population subgroups

The DfT were keen to explore whether there were any differences between social groupings and few differences have been found between socio-economic group, demographic group or lifestage group. Instead the research has identified some factors that underlie attitudes and some potential attitudinal groups. Segmenting the population according to attitude may support targeted communication activity and this research will inform planned work to explore this further.

The research enables a preliminary identification of different segments of the population which appear to have a different willingness to act and a different ability to do so in relation to travel and climate change. Some of the identified groups map well to the DEFRA pro-environmental behaviours segments, others less so.

The **key underlying factors which should help to define these groups** are:

- **lifestyle image and aspirations;**
- **level of personal control over taking action; and**
- **strength of feeling of personal responsibility to act which, in turn, seems to be conditioned by the strength of belief in:**
    - **the role of human activity in causing climate change; and**
    - **the impacts of individual actions.**

The identified attitudinal groups are proposed below.

'Believe but busy' believe climate change is happening and that human activity is a contributor; they care about climate change but feel that they are unable to act because they have other priorities, mainly children and work. Messages which connect to the time saving and convenience agenda and raising awareness of actions that are easy to implement, like efficient driving and trip-chaining, are likely to be effective.

'Contributors' are prepared to take action because they believe that small actions by many people will have an impact on climate change. They strongly support the idea that everyone should 'do their bit'. They are concerned about their children's future and hope that their behaviour will influence others. This group is typically more open to a wider range of behaviour change options, including those that take more effort (such as walking and cycling more) than those likely to be adopted by the 'believe but busy' group. More information about actions and their impact would motivate this group.

'Deniers' are **sceptical that human activity impacts on climate change**. They **tend to think observed changes are part of a natural cycle**. Likely to be quite a small group they may be motivated by cost and time saving arguments but not by environmental considerations.

'Ineffectuals', possibly divided into 'powerless' and 'don't care' believe that climate change is happening but do not believe that their actions will make a difference. Some may feel powerless; others may use this as an excuse not to act because they do not care enough to change. Those who feel powerless could potentially be motivated through developing their understanding about what difference actions they can take would make. Those who do not care will be motivated by personal benefits.

'Aspirationals' are **younger people**, who are **relatively well educated about climate change (although they may not feel so) but who have lifestyle aspirations that deter them from taking actions** that will reduce their carbon consumption.

There may also be **a group of mainly women who dislike driving** and who may react well to messages giving other reasons to drive less, even if it costs a little more.

Development of a detailed typology was not an explicit objective of this research and the research design did not enable a robust and representative segmentation. The typology outlined above should therefore be treated with caution and should be considered indicative. The findings from this study will provide a rich underpinning for the quantitative research planned by DfT that will identify and quantify whether attitudinal segments exist within the population in relation to climate change and travel behaviour.

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Appendix 1 Responses to Expert Information

During the project we explored with participants the impact of information provided by experts. As well as initial responses, meetings 4 and 5 provided opportunities to assess which pieces of information had made a lasting impact.

Introduction to climate change

Few participants recalled the initial explanation of the greenhouse effect and climate change later in the project. However, at the final meeting it was mentioned as a thought-provoking source of information by female participants in both the Less Affluent Younger Families and Middle Class Families groups. In particular, t**he potential impacts of climate change hit home for some participants in these groups**.

Science of climate change

At the first meeting, after the introduction to climate change, the most important things that participants wanted to know were why predictions on future changes to the climate vary and how it is known that humans are causing climate change.

The timescale of climate change in the recent past, as shown by charts in the presentations, shocked some in all groups. However, **the predicted speed of future change did not seem to be absorbed by participants**, even though the presentations included this information. This **perception that change will occur over a century or more is a significant barrier to whether individuals consider action now is necessary**. It may be that participants found it difficult to change their existing framing of the climate change problem but also they may not *want* to believe that significant change will happen in their lifetimes, despite information to the contrary. This was true of all groups, although Middle Class Families queried why action had not been taken earlier.

Of more interest to participants was the impact on the UK. Both Younger People and the Less Affluent Younger Families were especially interested in the possible impacts of climate change on the UK. In the Middle Class Families and Less Affluent Mature Families groups, participants wanted to know how population growth and deforestation affect global warming and how UK emissions compared with other countries.

Overall, after information was provided by the expert most participants felt more knowledgeable about climate change and were more convinced that it was happening and that the human activity is a cause.

> *"I think, without a shadow of a doubt, the climate is increasing in temperature, it's established that in my mind."*
> Educated Professionals, male (meeting 2)

The **biggest impact** was made by the combination of the two charts below. Figure A1.1 shows the **rapid increase in CO_2 in the atmosphere since the beginning of industrialisation** in the eighteenth century. Figure A1.2 shows the **increase in global temperature for the most recent period**. The relationship between these two charts **convinced participants of the impact of human activity on climate change**. **This information stayed with participants** and was referred to in the final meeting.

We can be confident that at least some of the statistically significant changes reported in chapter 3 of this report about belief in the role of human activity in causing climate change and the seriousness of climate change can be attributed to this information.

Figure A1.1 Change in the concentration of greenhouse gases in the atmosphere

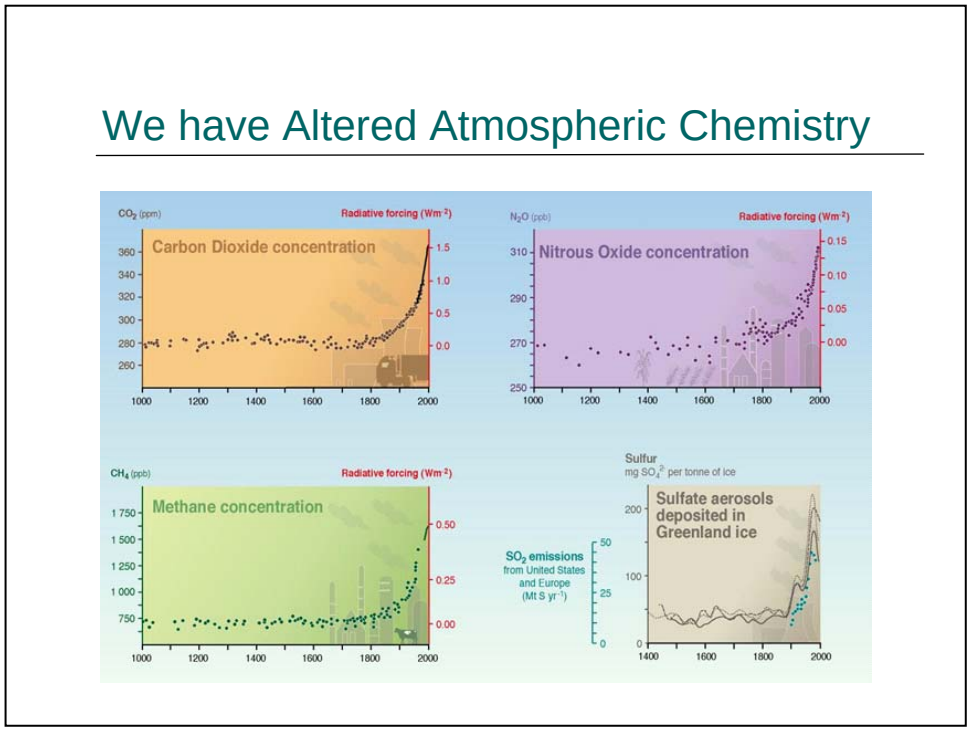
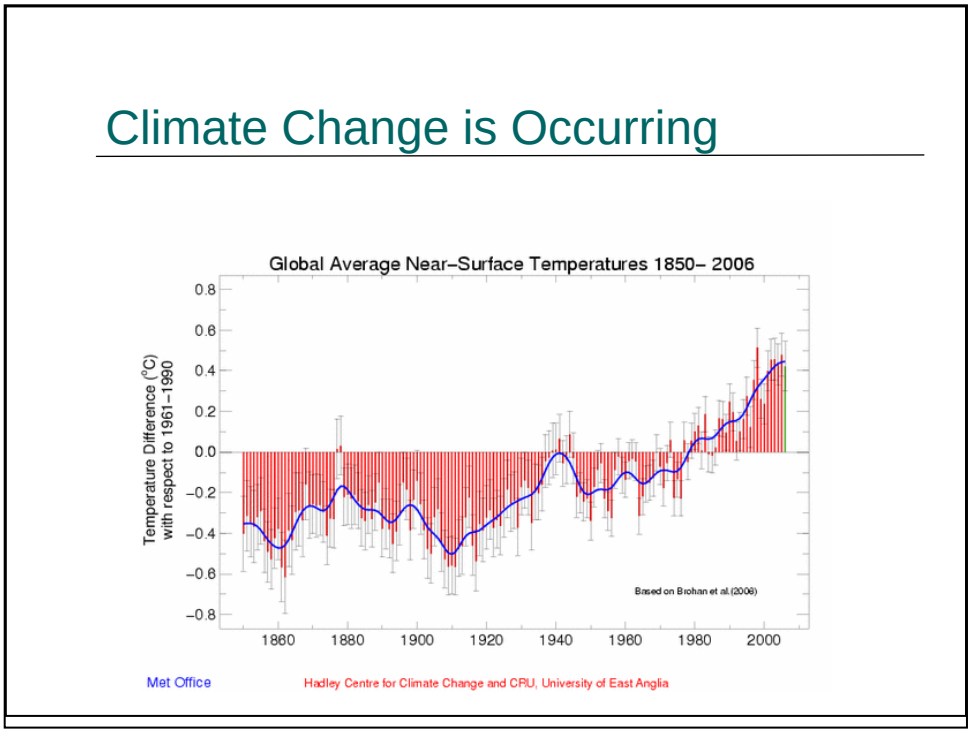


Figure A1.2 Increase in global temperatures



These graphs were seen as providing persuasive evidence, but such material in isolation is inadequate for many people as the graphical data needed to be explained. **The opportunity to debate the data directly with an expert helped convince individuals. The responses, and manner in which responses were delivered, served to reinforce the 'facts'.** In addition, amongst all but the Younger People the opportunity to discuss the data with other group members helped some to understand it.

> "[We are a] *relatively well-educated and 'captive' group, how helpful would information be to those not in that category?*"
> Educated Professionals, male (meeting 5)

The **credibility of the presenter was a very important factor and direct contact was important in establishing the credibility of the scientist**. The Educated Professionals were generally more trusting of the information presented, possibly because they felt on an equal par with the presenter and were more familiar with the academic system.

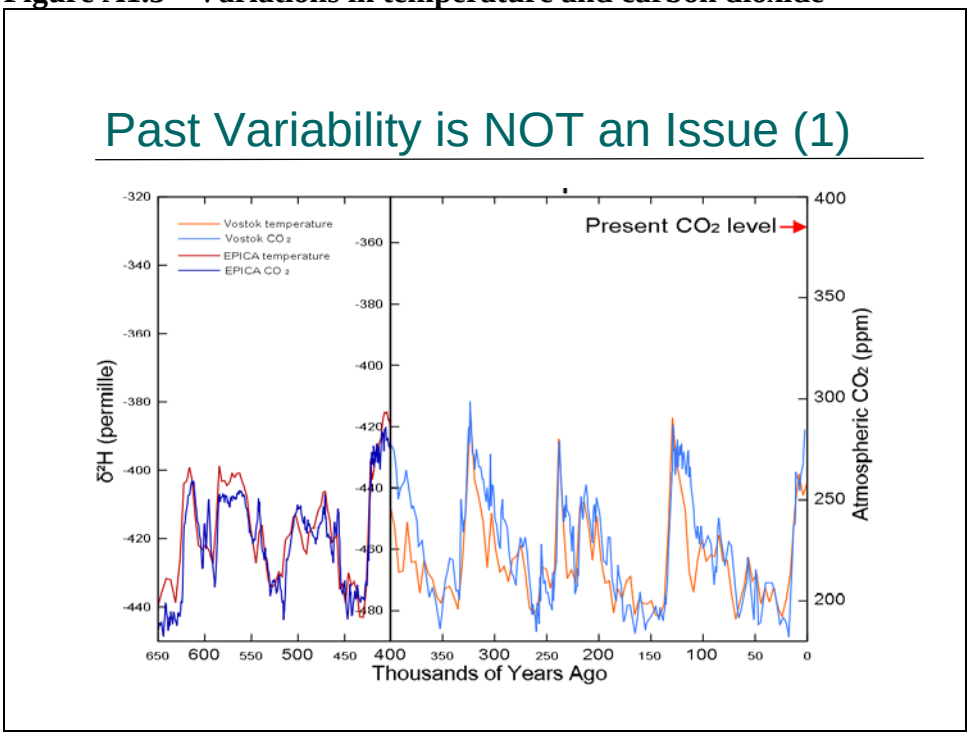
The impact of the impression given by the presence of the expert should not be underestimated. Participants gave feedback on their perceptions of the expert contributors and we found that the same individual presenting the same material, but to different sets of people, led to different feedback. Table A1.1 below shows the variation in responses to the same presenter with different audiences. This demonstrates that **the nature of the interaction between the scientist and the participants can be as important as the material presented**. The initially more sceptical Middle Class Families group found the presenter much less convincing.

Table A1.1 Reactions to presenter of scientific information

	Educated Professionals	Middle Class Families	Less Affluent Mature Families
Total Participants	**29**	**26**	**28**
Knowledgeable of the subject	26	19	27
Able to answer the questions	22	17	22
Interesting	26	20	23
Independent	11	11	19
Persuasive/convincing	17	5	20
Likeable	22	19	25
Able to explain himself clearly	20	15	25

At the final meeting, across all the groups, participants thought that scientific data should be an important part of any communication about climate change, as they had found the scientific evidence for the impact of human activity on climate change very convincing. However, participants highlighted that data in isolation could be confusing. For example, figure A1.3 was used to show that in the past, carbon dioxide levels had trailed temperature changes, but that carbon dioxide levels are now ahead in an unprecedented way, indicating that the current situation was not part of a normal cycle. However, by the final meeting, some participants referred to this graph as showing only the natural cycle and thought that this could lead to a perception that a drop in carbon dioxide and temperature is imminent. The mark showing the present carbon dioxide level had not made a long term impact compared to the apparently regular rise and fall of both temperature and carbon dioxide.

Figure A1.3 Variations in temperature and carbon dioxide



The scientific evidence was seen as compelling, but in isolation, few participants expected it to impact markedly on behaviour. It was described as a 'starting point'.

One question widely raised initially, but that persisted in the Less Affluent Mature Families group was the degree to which changes were real or simply the effect of better measurement capacity. This is likely to be an important point when communicating this sort of data.

There was not unanimous acceptance of the scientific data, but other participants viewed those more trenchant critics of the data as being unprepared to accept evidence that did not accord with their existing world view.

The group with the weakest recollection of this presentation was the Younger People, despite their positive response to the speaker at the time.

The implications are that scientific data, while potentially powerful and influential, needs to be used with care so that it is engaging, clear and unambiguous. A significant factor in this project was the direct interaction between lay participants and scientists, which cannot be re-created in a large-scale communication activity. This means that absolute clarity of communication is vital as there will not be the capacity to interactively re-present ideas and information in response to questions or misunderstandings, as could be done during this project. Thus simplicity of message will be a critical factor.

New technologies

Those in all the groups were expecting that new technologies would offer more solutions than the presentations suggested. However, they also thought that **the cost of new technology to individuals was high and that this will slow take-up**. There were more

questions on this topic from the Less Affluent Mature Families and the Less Affluent Younger Families, and these groups were more interested in the detail of the technology. Women as a whole were less interested in this presentation than men.

The Educated Professionals and the Less Affluent Mature Families were **concerned about** battery powered cars, in particular their efficiency and longevity, the **availability of biofuel and whether the full life cycle of cars** was taken into consideration when calculating their impact on the environment.

The Younger People and the Less Affluent Younger Families questioned why new technology was not more widely available and the Younger People also thought it would be some time before hybrid cars would filter through to the second-hand market.

Only a few participants were aware of the **energy efficiency ratings** now applied to cars voluntarily by manufacturers. While participants were interested that this information was now available, it is **unlikely to influence many car purchases, unless it provides a means of deciding between two vehicles which both offer the required functionality and are similar in price**. Moreover, the Younger People, the Less Affluent Younger Families and to a lesser, but still significant extent, the Less Affluent Mature Families, were not in the market for newly manufactured cars.

This presentation had little longer-term impact on the participants with few recalling much of the content when asked about it in the later stages of the project.

Transport best practice

There was a pervasive impression that transport systems in the rest of Europe and in London are better than those in the rest of the UK and that other towns and cities in the UK could learn from these examples.

The two main points taken from this presentation were: that cycle paths could be physically separated from motor traffic, making them safer but the cost of redesigning road systems to be more pedestrian and cycle friendly was surprisingly high and therefore probably unlikely to be adopted. In all groups there were individuals who expressed **a fear of cycling because of the volume of motor traffic on the roads**.

However, this presentation also covered the issue of how public transport is funded and the proportion of the costs drawn from passengers through ticket prices and the proportion from public subsidy. In **all the groups** participants said that they **had not understood why public transport in the UK is more expensive to the passenger than in other European countries.** The Educated Professionals said that they would be more prepared to pay more to travel than they do at present if the extra money was specifically earmarked for improving the transport infrastructure and the Middle Class Families asked what was being done with the *"eco taxes"* already being collected.

This presentation also had little longer-term impact, some of the female participants in the Less Affluent Younger Families and Middle Class Families groups recalled that there might be lessons for the UK in the actions taken in some European cities. The overall **lack of engagement was probably a reflection of the lack of local relevance** of much of the material, a point that had been remembered by the Less Affluent Mature Families.

National policy

Whether national climate change targets were likely to be met was of interest to participants in all the groups but the Less Affluent Mature Families in particular wanted to know to whom the Government was accountable if targets were not met.

The Educated Professionals and Middle Class Families asked about population growth and whether this had been incorporated into the statistics on future CO_2 levels. They also wanted to know the economic costs of not reducing carbon consumption, whether Government targets were realistic and whether the UK faced penalties if it failed to achieve targets. **The perception that targets might not be realistic and that there seemed to be little evidence of Government action to ensure that targets were met, made it harder for participants to accept that their actions were relevant or significant.**

The Educated Professionals and Less Affluent Mature Families both questioned why the Government is spending money on what they understand to be private bus and train services and the issue of taking transport back into public ownership was raised by participants in all groups. The view that the quality of public transport had declined since privatisation pervaded all the lifestage groups. Tax incentives to change behaviour in favour of car sharing were suggested by Younger People.

Across the board **little was known about Government transport policy**. Following the presentation there was often a **concern that policies at a national level were not being implemented at the local level**. The Less Affluent Younger Families in particular felt that they were not benefiting from investment in public transport; they also queried how public transport and road policies were developed. This group also wanted **more compulsion on local government to adopt central Government guidance**. While at first sight these issues might appear tangential to climate change, they once again highlight the perception that public transport does not offer a viable alternative for many people in many situations. Clear national Government leadership was felt to be a necessary component of firstly ensuring that public transport is a viable option and secondly encouraging its use.

> *"The Government make all these policies but then hand them all out to the local authorities but make it optional for the local authorities… you put the onus on them and then it just diffuses…."*
> Less Affluent Younger Families, female (meeting 2)

This was another presentation that made little long-term impression.

Individual actions

Participants thought that they had few ideas on the travel behaviour options available to them that would reduce their CO_2 emissions. They hoped that this presentation would provide more ideas. In this respect the presentation was somewhat disappointing for many because they did not perceive that it provided much in the way of new ideas, although there were some points that were new (see chapter 7). Participants had also hoped that there would be one big change that they could make that would have a big impact on carbon dioxide emissions. Hence at the end of the presentation they felt somewhat let down and that they had not learnt much.

The initial response to this presentation may have been disappointment about the lack of new ideas but the effect of relatively simple actions increasingly struck a chord with many participants as time went on. A common sentiment at the start of the project had been that individual contributions would be meaningless; however **simple actions that were easy to take and might save money were increasingly regarded as important**.

This revised view of small actions stayed with people and was referred to in some of the final in-depth telephone interviews, although the key point in influencing action appears to have been personal benefit, with wider environmental benefits a secondary impact.

> *"Cost* [to the individual of fuel] *and the effect on the planet are inextricably linked."*
> Educated Professionals, male (follow-up telephone interview)

Personal carbon consumption information

When presented with the results of their first travel diaries the participants were keen to compare the carbon used in different journeys to inform modal choice. In reviewing the feedback participants were surprised by:

- the impact on carbon dioxide emissions of one long trip;
- the impact of air travel (especially that one trip can double or triple the weekly emissions of a public transport user);
- how far they travelled in one day or week; and/or
- how many trips they made.

As discussed in chapter 4, some participants had not realised how many trips they made and the information led them to consider whether all journeys, especially shopping trips, were necessary. Business travel was seen as unavoidable and some felt they had less scope for change, not only in whether or not they made the trip but also in the mode used, because they were bound by their employer's travel policies.

Some participants could not see how they could reduce their emissions further when they were already low; this was particularly true for the Younger People and for non-drivers in all the lifestage groups.

Across all five groups, participants stated that the travel diaries impacted on attitudes and behaviour. The simple act of measuring behaviour heightens awareness of that behaviour. For many, a desire to be seen to be *'doing the right thing'* meant that they wanted to achieve lower CO_2 emissions in their later travel diaries. Participants who had made changes to their transport patterns were pleased to see the impact of their actions recorded. A few who felt that they had made changes that were not recognised in their travel diary report were noticeably disappointed.

A weakness of the travel diary reports was that absolute carbon usage data was meaningless to participants, as has been reported in section 3.3.3 of the main report and found elsewhere (Coulter et al., 2007). The comparative data provided a context for individual data and enabled comparison between modes of transport, which the Educated Professionals found stimulated discussion on actions. The Less Affluent Mature Families however, suggested that this information in isolation will not drive behaviour change.