Centre for Transport Studies
University College London

Potential for mode transfer of short trips: Report on the analysis of the survey results

A contract carried out for the Department of the Environment, Transport and the Regions

Roger L Mackett and Aoife Ahern

Centre for Transport Studies
University College London
Gower Street
London
WC1E 6BT
Tel: 020 7679 1554
Fax: 020 7679 1567
E-mail: rlm@transport.ucl.ac.uk

September 2000

PREFACE

This report presents the findings from the analysis of surveys carried out under a project entitled `Potential for mode transfer of short trips'. It has been carried out in the Centre for Transport Studies at University College London (UCL) for the Charging and Local Transport Division (CLT) of the Department of the Environment, Transport and the Regions (DETR). The survey work was sub-contracted to Steer Davies Gleave (SDG).

This report was written by Professor Roger Mackett, based on the processing of the database by Ms Aoife Ahern. The assistance of Dr Sandy Robertson in setting up some of the analysis procedures is acknowledged.

The overall objective of the work was to contribute to Government policy to encourage the use of the environmentally benign travel modes in order to reduce the amount of travel by private car. The focus was on the encouragement of the use of walking, cycling and public transport (buses in particular).

DISCLAIMER

CONTENTS

EXECUTIVE SUMMARY

1 The approach

This report presents the findings from a project entitled `Potential for mode transfer of short trips'. It has been carried out in the Centre for Transport Studies at University College London (UCL) in partnership with Steer Davies Gleave (SDG) for the Department of the Environment, Transport and the Regions (DETR). The overall objective of the work was to contribute to Government policy to encourage the use of the environmentally benign travel modes in order to reduce the amount of travel by private car. The focus was on the encouragement of the use of walking, cycling and public transport (buses in particular).

The focus of this work is `short trips'. In this report these are usually taken to be those of less than 5 miles (8 kilometres). A new trip starts when there is a change in the mode of transport or the purpose of travelling. Because the focus of this work is short car trips it was important that these were studied in detail. Hence this definition of a trip which is different from that in the National Travel Survey (NTS) has been adopted. (In NTS, a trip ceases when there is a change of purpose and so may involve travel on more than one mode).

This report presents the analysis of in-depth interviews carried out in five areas with 377 people who have made short trips by car. The five areas were London, Leeds, Ipswich, Hereford and Dorset. The analysis focuses on why they used their cars for the trips, whether there are any alternatives to the use of the car, and what they are, and what action would be required to make them choose that alternative. The study has focused on the positive factors which would attract them to the alternatives. It was not part of the brief to estimate what scale of action would be required to make them give up using cars. However, a number of initiatives that will make car use less attractive are going to be introduced, including congestion charging and workplace parking levies. It is going to be important to offer alternatives to the car as part of a package of measures. The research being reported here helps to identify which of the alternatives are likely to be attractive and what is needed to increase their use by car drivers. This work also helps to identify the policy areas where action should be targeted in order to help maximize the potential reductions in car use.

It is important to stress that the key element of this work is that it has involved the examination of real car trips and the alternatives perceived by those undertaking them. Carrying out household interviews meant that it was possible to obtain the information within the context of the respondents' lifestyles, constraints, perceptions and environment.

It should be noted that this research has concentrated on the alternatives to the car that car users perceive and what would make them choose them, rather than on the policies that might make them give up their cars, for example congestion charging. It should recognised that the actions identified in these surveys are unlikely, on their own, to reduce car use significantly, and that policies that increase the cost of using the car or restrict its use in some other way, would be necessary.

2 Why cars are used

The first issue that has been considered is the reasons why people use their cars for short trips. The main specific reasons identified by drivers were the carrying of heavy goods, usually, but not always, shopping, giving lifts particularly taking children to school, shortage of time, and because the car is

needed for another trip. A lot of people used their cars for convenience and because of the distance involved. Sometimes the car would not have been used if the circumstances had been different, such as when it was used because of illness and bad weather. Relatively few examples of trivial reasons for using the car were found. The main reasons given by passengers were the length of the trip, the need to carry heavy goods, and convenience.

The main factor that seems to influence the use of the car for a short trip is the purpose of the trip. It largely explains the differences between males and females, differences between the young and the old and differences over the day. Those living in households with more than one car are more likely to use the car for reasons of convenience, whereas those with only one car are more likely to use it out of necessity. In urban areas the car tends to be used more because of time constraints and in order to give lifts to children, while in rural areas it is more for social activities and because of the distance to activities.

3 Alternatives to the car

Alternatives to the car were identified for 78% of the car driver trips, leaving 22% for which no alternative could be identified despite extensive prompting by the interviewers. The main reasons for not identifying alternatives were an unwillingness or inability to do so, the need to take the elderly and ill and the need for a car at work. The types of trips which it seems would be most difficult to transfer away from the car are business and work trips, whilst the easiest would be taking children to school. It seems that it would be easier to transfer longer short trips away from the car then very short ones because in many cases the car is being used for the latter because it is essential whereas it is more likely to be used out of convenience for the longer trips.

Women appear to be more likely than men to reduce their use of the car, but this largely reflects the relative mixes of trip purposes. The young are more likely to reduce their use of the car than the elderly. This is partly because they are more willing to cycle and use the bus than their elders. It would be most difficult to reduce the number of short trips early in the morning, partly because of the nature of the trips, but also because of the lack of alternatives. It would be easier to reduce the number of short car trips in urban areas than in rural areas also because of the greater range of alternatives available.

According to the surveys, of all the short trips by car drivers, about 31% would transfer to walk, 31% would go by bus and 7% would cycle. About 4% might not travel at all if it was not possible to go by car. In about half of these cases the need that was met by the trip would be met by others. Quite a lot of the latter are escort trips, so the person being taken by car would travel by themselves using another means of travel or be taken by car someone already making the trip, such as a neighbour taking his or her own child to the same school.

The results are similar for car passengers. About 24% of car passengers were unable to identify any alternatives, which is slightly higher than the equivalent for car drivers. Of those who could switch, bus is the most popular, particularly for those going to work and the shops. This is followed by walking which appealed most to those on business and personal trips. Cycling was less popular as an alternative for passengers than for drivers. Taxis appealed more to passengers than drivers as an alternative, particularly with those on social trips and those for whom a car trip was being especially made. Those in this last category were amongst the ones least able to identify possible alternatives,

along with those being taken because they felt unwell, those travelling with the elderly or ill, or those who needed to make a further trip.

Male car passengers were more likely to identify alternatives than females, and were more willing to walk and cycle. Elderly car passengers were much less able to identify possible alternatives than the equivalent drivers. This was also true of the younger passengers. Many of the young were prepared to consider walking, but very few identified cycling as an alternative. Bus is a popular alternative with all age groups.

In contrast to car drivers, for passengers it is the longest short trips (two to five miles long) for which there seem to be fewest alternatives, partly reflecting the fact that the only way some passengers could reach their desired destinations was to be taken by car.

4 Policies and other actions to reduce car use

The single policy intervention that the respondents say would do most to attract them out of their cars is to improve bus services which could attract up to 21% of car drivers. In particular, increasing the route coverage and frequency of buses would make them much more attractive. More all-night buses would be very helpful. It is also important to improve the perception and knowledge of bus services by car drivers. The perception of the safety and security of children when travelling needs to be increased. This last factor might be assisted by the re-introduction of conductors on buses.

The respondents identified little in the way of specific policy intervention that could encourage more walking. However, improving safety, especially for children would help, as would introducing more local shops and other facilities. Better street lighting would also be useful. Many car drivers recognise that they need to take personal action to encourage themselves to walk, including improving their own organisation (and encouraging their children to get up earlier on school days). There is a case for more education and publicity on the benefits of walking to raise people's awareness of it as an alternative.

There is not very much evidence from the surveys of measures that would encourage more cycling, although improving facilities for cyclists would have some effect.

The variation in the effectiveness of the policy instruments across trip lengths is not large and reflects the suitability of the three alternative modes to take people on short trips of various lengths: walk the shortest and bus the longest. Improving walking facilities by making the streets safer, and providing more local facilities, could reduce the number of very short car trips (less than one mile long) by about 11%. There are not all that many of this type of trip.

A significant factor that deters many people from walking and cycling is bad weather. Whilst nothing can be done about improving it, it would be possible to make travelling by bus in bad weather more attractive by providing more bus shelters and a more reliable service.

Government, both central and local, has a role to play in the policy actions which could shift about 35% of the short car trips. As indicated above, the organizations that have most potential to encourage drivers out of their cars are bus companies. The legislation already exists to provide socially necessary routes, but there will need to be funding to provide more routes and greater frequency. In the long run, with sufficient transfer of car trips to bus, such enhancements may become self-financing, but in the

short run there needs to be an injection of cash. Reducing fares would do little to attract car users to buses.

Taxis could be used for some shopping and social trips but are perceived as expensive. There is no great advantage in encouraging taxi use if it simply means that a self-driven car trip is replaced by a taxi trip. But if some people gave up their cars because they felt able to use a taxi when none of the other alternatives was suitable, this could lead to a significant decrease in the number of short trips. Also, a taxi trip instead of a car trip may be potentially beneficial because car trips may involve searching for a parking space which may add to congestion. Substituting taxi trips for private car trips should reduce the demand for parking spaces. (Taxis driving around empty, looking for passengers, of course, add to unnecessary trips by car on the road).

There may well be a case for encouraging taxi-sharing as a way of reducing costs. Given the need to increase the route pattern and frequency of buses and the perceived high cost of taxis there seems to be scope for the introduction of demand-responsive services, based on large cars or minibuses particularly for shopping and social trips. These could involve such vehicles operating between a fixed pair of points but with flexible routes so that passengers can be delivered to their doors to overcome the problems of carrying heavy goods and fears about personal safety, and helping to reduce the impact of bad weather.

Other bodies who have a role to play are retailers and employers. The former need to provide more local shops so that customers can walk or cycle more easily. The problem of carrying heavy goods can also be alleviated by the expansion of delivery services. These need to be organised rationally, so that several car trips are replaced by one van trip. Employers can help by providing showering and changing facilities for those who cycle or walk. They can also help by negotiating more convenient bus services with operators as part of their company travel plans.

5 The effects on traffic at a national scale

The survey results have been scaled up using factors from the NTS so that the effects on traffic at a national level could be estimated. The various actions identified in the surveys could reduce the total number of car trips by about 22% and the total distance travelled by about 5 or 6%. Actions which increase bus use could reduce the total number of car trips by about 14% and the distance travelled by about 4%. Actions which increase walking and cycling could reduce the number of car trips by about 3% and 1.5% respectively, and the distance travelled by car by about 0.3 to 0.4% each.

Overall, the actions and policies discussed here could make a significant difference to the number of car trips, and a smaller, but non-trivial difference to the total distance travelled by car. The key question is whether the actions that the respondents mentioned actually would make people transfer from their cars. The answer is, probably not without strong policies to reduce car use. What the results here show is that if such policies were introduced, there would be alternatives for the majority of short car trips, and that there would be a noticeable difference in the levels of traffic on the road.

6 The future behaviour of the respondents

Over half the respondents could see ways in which their trips could be made in ways that are more friendly to the environment, but only 17% said that they would consider making the same trip in a different way if they made it again next week. About a quarter of the respondents could identify ways

of making the trip more enjoyable for themselves, but few could think of ways of improving it for passengers. The main finding that comes out of this analysis is that the young are much more able to see ways of making the trip in a way that is environmentally friendly, and are more willing to consider alternative ways of making the trip.

7 Recommendations

The following recommendations are made:

- Bus services should be improved in terms of route coverage, frequency and hours of service;
- Car drivers should be made more aware of bus services, both specific services and generally;
- The perception of the safety and security of children travelling unaccompanied should be increased, for example, by re-introducing bus conductors;
- Taxi-sharing should be encouraged;
- Demand-responsive public transport services should be introduced especially for shopping and social trips;
- Car drivers should be made more aware of the benefits of walking and cycling;
- Walking and cycle facilities should be improved, including better street lighting;
- Employers should be encouraged to provide showering and changing facilities for their employees who cycle and walk;
- The effects of bad weather should be ameliorated by installing more bus shelters and improving the reliability of bus services;
- Neighbourhood planning should be used to help develop more local shops and facilities;
- Delivery services from shops should be expanded in a way that ensures that one van trip replaces several car trips.
- Actions should be targeted where they are most likely to be effective:

    at those using cars to take children to school rather than those on work and business trips;

    at the young rather than the old;

    in urban areas rather than rural;

    at those with multiple car ownership (and therefore those with higher incomes);

    at those making rather longer short trips rather than those making very short trips;

at young males for cycling initiatives.

Implementation of these recommendations will not, on their own, cause significant numbers of drivers to reduce their use of the car, but, linked with policies aimed at reducing car use, they do offer considerable scope for reducing car use for short trips. In particular, they indicate where action should be concentrated in order to maximize the impact of policies to reduce car use.

1 INTRODUCTION

The amount of travel by car is increasing, leading to a range of problems. According to the National Travel Survey (NTS) (Department of the Environment, Transport and the Regions, 1999) a quarter of all car trips are less than two miles long and more than half are less than five miles. There is scope to transfer many of these trips to the less-damaging modes of walk, cycle and public transport (particularly bus).

This report presents the findings from a project entitled `Potential for mode transfer of short trips' which was set up to address these issues. It has been carried out in the Centre for Transport Studies at University College London (UCL) in partnership with Steer Davies Gleave (SDG) for the Department of the Environment, Transport and the Regions (DETR). The overall objective of the work was to contribute to Government policy to encourage the use of the environmentally benign travel modes in order to reduce the amount of travel by private car. The focus was on the encouragement of the use of walking, cycling and public transport (buses in particular). The specific objectives of the project were:

a) to examine what can be gleaned from existing data to achieve the project objectives;

b) to study in detail the short trips made by a sample of travellers to determine which trips might realistically have been done by walking (as part of public transport journeys as well as a mode on its own) or by cycling, and the measures required to induce a change;

c) to make a quantified estimate of the proportion of short trips of various lengths that might be induced to change mode from car to cycle or walk or to public transport at various levels of policy intervention;

d) to infer from this the range of traffic reduction that might be achieved by measures to encourage cycling and walking.

Existing data sources have been examined to see what information can be gleaned on these topics. This is described elsewhere (Mackett and Robertson, 2000).

The focus of this work is `short trips'. In this report these are usually taken to be those of less than 5 miles (8 kilometres). (In this report imperial units will be used in general because these units are used in most of the comparable data sources and were used in the surveys). A new trip starts when there is a change in the mode of transport or the purpose of travelling. Because the focus of this work is short car trips it was important that these were studied in detail. Hence this definition of a trip, which is different from that in NTS, has been adopted. (In NTS, a trip ceases when there is a change of purpose and so may involve travel on more than one mode). It should also be noted that this work concentrates on the alternatives to the car that car users perceive and what would make them choose them, rather than on the policies that might make them give up their cars, for example, road pricing. It should recognised that the actions identified in these surveys are unlikely, on their own, to reduce car use significantly, and that policies that increase the cost of using the car or restrict its use in some other way, would be necessary.

2 THE PROJECT

2.1 The rationale behind the project

Whilst data sources such as the National Travel Survey are useful to show the scale of use of the various modes for different types of trip, it is very important to recognise that travel is much more complex than implied by such reports. Although some trips do involve a simple outward journey for a single purpose with the return leg a mirror image of the outward leg, many do not. This is particularly important when considering changes in response to policy or other intervention.

This can be illustrated by an example: suppose one member of a household currently travels four miles by car to the shops to buy some items of food (e.g. milk, bread and butter) and then returns home. Suppose that there is some policy or other intervention that means that he or she is no longer able to use the car for this trip. One possibility is that he or she shifts mode to walk, cycle or bus. However, it is a very long way to walk (less than 1% of walk trips are this long), many households do not own a bicycle, and many origin-destination pairs are not served by bus. There are, of course, several other alternatives: the person could switch to another destination (possibly less satisfactory); he or she could do the shopping in the course of another trip, for example to work; another member of the household could do the shopping in the course of another trip; the trip may not be made at all, and the next household shopping trip might be made slightly sooner.

This hypothetical example illustrates why it was essential to consider a wider range of responses than just mode switching if it is desired to reduce the amount of short travel. If the focus was only on alternatives that, in fact, are not feasible in many cases, any policy interventions based upon this work would be likely to fail.

2.2 The approach adopted

The approach adopted in this project was to identify a number of short trips being undertaken by car and then to discuss with those making the trips the alternatives which they might adopt. These possible alternatives include changing mode, travelling to somewhere different, asking someone else to achieve the purpose of the trip in the course of one that he or she was taking, or in some other way such as home delivery. This range is wider than implied in the original objectives specified by the DETR because it was recognised in the project that reducing car use could be associated with a wider range of actions than just mode switching.

It is important to stress that a key element of this work is that it has involved the examination of real car trips and the alternatives perceived by those undertaking them. There are other studies which simply ask people's views on the alternatives, for example asking respondents what would make them cycle more. Such studies have a value and some have been included in the literature review undertaken in the course of this project (Mackett and Robertson, 2000), but they are bound to be less precise than the approach of asking respondents about specific trips by car. Carrying out household interviews meant that it was possible to obtain the information within the context of the respondents' lifestyles, constraints, perceptions and environment.

2.3 The surveys

The discussion above about the complexity of travel behaviour which might influence the impact of policy interventions on short trips has important implications for the analytical approach adopted in this project. It meant that it was essential that household interviews were used as the main source of data. These were conducted by Steer Davies Gleave (1999) and involved a two-stage procedure in five areas selected on the basis of the type of area, from dense urban to rural, and the topography, from flat to hilly. The latter was significant because it might affect perceptions about cycling and walking. The first stage, the travel survey, involved the collection of household and person information, and involved household members in keeping a travel diary for a two-day period. From these travel diaries short trips by car were identified for detailed discussion at the second stage, the in-depth interview. The two-day periods were allocated to the households in such a way that data were collected over all days of the week within the sample.

The first stage required the random selection of households in the three areas within each of London, Leeds, Ipswich, Hereford and Dorset using the Postcode Address File (PAF). The following procedure was adopted: a pre-contact letter was sent to these households in the name of the DETR. The letter explained the nature of the survey, stressed the need for co-operation and informed the recipients that an interviewer would visit them within the following week or so. At that meeting the interviewer completed a form describing the details of the household, vehicle ownership, and various administrative information associated with the survey. (The information collected is described in Appendix A). In addition, the interviewer also left behind a `Memory jogger'. This is a simple form on which the respondents recorded all travel for their two travel days in terms of the destination, arrival and departure time and mileometer reading for car trips. This was used at the next interview stage to help the respondents to recall the trips which they had made, not for detailed recording of information. Appointments were made to speak to each member of the household aged 10 years or over at an agreed time after the travel days.

At the follow-up interview travel information was collected about each household member over the two-day period, including where they travelled to, how they travelled, how far it was, when they travelled, and the purpose of the journey. Information on vehicle-driving licence holding and income was also collected.

The data were examined to see which households had made short trips by car over that period. From these, about 400 households were selected at random for in-depth interviews about their short car trips. This included prompted unstructured questions on the range of alternatives, including modes of transport, travelling elsewhere and somebody else travelling.

The data were coded by SDG and sent to UCL where further checks were carried out. The data were analysed, as discussed in the next section.

3 THE DATA

3.1 The response rate

The data were used to create an Access database which was analysed at UCL. As indicated above, the data are available at two levels: the travel survey and the in-depth survey. At the first stage 2488 households were approached by SDG, distributed between the areas as shown in Table 1. The response rates varied between the areas. The lowest was in London at 30.8%, with rather higher rates elsewhere, giving an overall average of 48.1%. This is a rather low rate compared with, for example the National Travel Survey which has an overall rate of over 70%. It has not been possible to determine why the response rates were so low.

Table 1 Number of responses in the interviews in the travel surveys

	London	**Leeds**	**Ipswich**	**Hereford**	**Dorset**	**Total**
Number of addresses approached	494	501	490	502	501	2488
Number of valid addresses	454	482	480	444	461	2321
Number of useable responses	140	253	245	214	265	1117
Response rate (%)	30.8	52.5	51.0	48.2	57.5	48.1

At the in-depth stage, 377 people were interviewed by SDG as shown in Table 2. There were a total of 1624 car driver trips made by 310 people, an average of 5.2 each, and 263 car passenger trips made by 99 people, an average of 2.7 each (32 people made both types of trip). Because of the lower response rate in London at the first stage, the number of trips examined in depth is lower there than in the other areas.

3.2 The analysis

The data in the travel survey may be regarded as fairly standard travel diary information. Its main purpose was to identify the short car trips. It can also be linked with the in-depth data for the trips included there to provide information on factors such as trip purpose, age, sex and car ownership level. This means that the data on the alternatives can be cross-tabulated against such factors. The data collected in the surveys are listed in Appendix A.

Table 2 Responses in the in-depth interviews

	London	**Leeds**	**Ipswich**	**Hereford**	**Dorset**	**Total**
Number of people	53	109	57	74	84	377
Number of car drivers	38	85	54	61	72	310
Number of car passengers	16	37	10	17	19	99
Number of car driver trips	147	491	333	372	281	1624
Number of car passenger trips	40	107	20	43	53	263

In the in-depth survey information about each trip was collected in unstructured form with the interviewers using a series of prompts about factors such as the alternative modes that might be used, whether someone else could make the trip, and whether the objective could be met in some other way. The data on each trip were coded by SDG to four categories:

The reasons why cars were used for the trip;
The alternatives to using the car;
The probability of adopting that alternative (high or low);
The event that would have to happen to make the person adopt the alternative.

The rest of this report is devoted to the analysis of the results and the drawing of conclusions. The analysis methodology is described in Appendix B. In the next section, the patterns of trips in the surveys are discussed.

4 THE PATTERNS OF TRIPS IN THE SURVEYS

4.1 The data to be examined

In this section the data obtained at the two stages of the surveys are examined. Three sets of trips are examined: all the trips recorded in the travel survey, the subset of these which are less than five miles long, and the short trips examined in the in-depth survey. The comparison of the first two facilitates consideration of whether short trips are different in nature to other trips, and comparison of the trips considered in the in-depth survey with the set from which they were selected will show possible sources of bias. The trips are disaggregated into car driver and car passenger trips, so it is possible to consider how these differ, particularly for short trips. These data are considered for six topics: the purpose of the trip, the sex of the traveller, the age of the traveller, the number of cars owned by the household, the time of travel and the area of residence. In each case the figures are shown as absolute numbers, so that the readers can assess for themselves what reliability to place on particular results, and as percentages, to facilitate comparison between the three sets of trips (all trips, short trips and trips examined in-depth).

Table 3 shows the distribution of trips between car drivers and car passengers in the three surveys. It can be seen that the travel survey included 12341 trips, split in the ratio of two to one between car drivers and car passengers. Of these trips, 8989 were short, that is 73%. This compares with NTS 1996-98 where 58% of car trips were short (Department of the Environment, Transport and the Regions, 1999). This differences reflects the fact that the project being described here was focusing on such trips and so areas were selected where such trips were more likely to occur. 1887 short trips were examined in-depth, which is 21% of the short trips identified in the travel survey. Proportionately more car-driver trips were examined at this stage. This reflects the fact that car drivers are likely to be more important than passengers in determining potential shifts away from the car.

Table 3 Trips by car drivers and car passengers in the surveys

	Travel survey – all trips		**Travel survey – all short trips**		**In-depth survey trips**	
	Number	**%**	**Number**	**%**	**Number**	**%**
Car drivers	8199	66	5888	66	1624	86
Car passengers	4142	34	3101	34	263	14
Total	**12341**	**100**	**8989**	**100**	**1887**	**100**

4.2 The purpose of the trips

Table 4 shows the number of trips disaggregated by main purpose while Table 5 shows the equivalent percentages. It can be seen that `home' is the purpose with the highest number of trips associated with it in all cases. It would be possible to code all trips to home according to the purpose of the origin of the stage as happens in NTS. However, this is felt to be misleading because many of the trips are part of multistage journeys (shown by the fact that the number of `home' trips is considerably fewer than

half the total). Coding them to the final stage would bias the responses towards trip purposes which tend to be undertaken at the end of multistage journeys.

Excluding `home', `main job' is the biggest category for car drivers in the travel survey, but `other escort', that is, accompanying others on trips, is the largest for short trips. `Shopping' is also important in both cases. For car passengers, for all trips `other social', and `other escort' are the largest. Perhaps the biggest differences between the distributions for car drivers and car passengers is the large number of trips on employers business in the former case and the large number of education trips in the latter case. The number of education trips is fairly closely matched by the number of escort to education trips by car drivers.

The distributions in the in-depth surveys match the patterns of short trips in the travel surveys fairly well. The following trip purposes are over-represented for car drivers: main job, shopping, escort to education, and visiting friends, while the following are under-represented: employers' business, and trips returning home. The difference for employers' business is quite large and probably reflects the fact that people making that type of trip may be away from home more and so more difficult to interview. For car passengers, the trip purposes that are over-represented in the in-depth survey are main job, employers' business, shopping, eat and drink, and change mode. `Change mode' means that the car was used as an access mode, for example to the railway station. The under-represented trip purposes are medical and dental, education, escort to education, and other escort. The last three are under-represented because they are largely made by children (In the case of escort trips this is mainly as car passengers accompanying adults). Only people aged 16 or over were interviewed, hence the under-representation of these trips.

It will be noticed that some of the categories in the in-depth survey are rather small, and so they have been aggregated for the purposes of analysis. `Main job' and `other job' have been grouped and labelled `work'. `Employer's business' is just called `business' from now on. `Medical and dental' is included in `personal business'. `Education' is usually included in with `home' and labelled `home and education'. `Eat and drink', `visit friends', and `other social' are put together as `social'.

4.3 Sex and age differences

Tables 6 and 7 show the differences between males and females. When all trips are considered, there are about the same numbers of males and females travelling, but males are more likely to be drivers and females more likely to be passengers. When short trips are considered, there are rather more females driving, but still fewer than males. This probably reflects the different mix of trip purposes. There is very little difference in the ratios of males to females between short trips and all trips for car passengers.

Table 4 Number of trips for each purpose in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Main job	1072	137	1209	663	98	761	194	17	211
Other job	56	7	63	40	2	42	9	1	10
Employers' business	504	52	556	263	21	284	23	6	29
Shopping	816	346	1162	657	260	917	197	43	240
Personal business	315	107	422	256	85	341	71	6	77
Medical and dental	49	27	76	38	18	56	11	1	12
Education	32	244	276	21	219	240	3	3	6
Escort to education	285	98	383	250	91	341	74	1	75
Other escort	854	461	1315	686	379	1065	207	8	215
Eat and drink	90	100	190	57	72	129	15	13	28
Visit friends	398	302	700	276	200	476	90	17	107
Other social	569	532	1101	367	361	728	100	32	132
Change mode	272	201	473	216	141	357	67	20	87
Home	2880	1522	4402	2095	1152	3247	563	95	658
Unknown	7	6	13	3	2	5	0	0	0
Total	**8199**	**4142**	**12341**	**5888**	**3101**	**8989**	**1624**	**263**	**1887**

Table 5 Percentage of trips for each purpose in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Main job	13	3	10	11	3	8	12	6	11
Other job	1	0	1	1	0	0	1	0	1
Employers' business	6	1	5	4	1	3	1	2	2
Shopping	10	8	9	11	8	10	12	16	13
Personal business	4	3	3	4	3	4	4	2	4
Medical and dental	1	1	1	1	1	1	1	0	1
Education	0	6	2	0	7	3	0	1	0
Escort to education	3	2	3	4	3	4	5	0	4
Other escort	10	11	11	12	12	12	13	3	11
Eat and drink	1	2	2	1	2	1	1	5	1
Visit friends	5	7	6	5	6	5	6	6	6
Other social	7	12	9	6	12	8	6	12	7
Change mode	3	5	4	4	5	4	4	8	5
Home	35	37	36	36	37	36	35	36	35
Unknown	0	0	0	0	0	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 6 Number of trips by each sex in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Males	4614	1508	6122	3117	1120	4237	828	48	876
Females	3585	2634	6219	2771	1981	4752	796	215	1011
Total	**8199**	**4142**	**12341**	**5888**	**3101**	**8989**	**1624**	**263**	**1887**

Table 7 Percentage of trips by each sex in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Males	56	36	50	53	36	47	51	18	46
Females	44	64	50	47	64	53	49	82	54
Total	100	100	100	100	100	100	100	100	100

In the in-depth interviews there is even more shift towards females. More females than males were interviewed, possibly because they were more likely to be at home to be interviewed. There is a noticeable difference for car passengers. This may be because no children under 16 were interviewed and they are probably distributed fairly evenly between the sexes. When they are removed from a set of car passengers, there is likely to be a shift towards females.

The next disaggregation to be considered is age, as shown in Tables 8 and 9. In the travel survey those under 17 are interesting for two reasons. Firstly, there appear to be 5 people who drive whist under the legal limit of 17. They have not been included in the in-depth survey. Secondly, people under 17 travelling as car passengers tend to make proportionately more short trips than long trips, whereas there is little difference for the other age groups.

In the in-depth survey, the age group 30 to 39 is over-represented for drivers and passengers, and the adjacent ones for car passengers only. Some of these may well be women at home during the day who could be contacted easily for interviewing. Not interviewing those under 16 means that the category of under 17 is almost empty and so under-represented. The elderly tend to be over-represented, again probably reflecting their availability for interview.

Because some of the categories in the in-depth interviews are rather small, they have been aggregated to three groups for further analysis: 29 and under, 30 to 59, and 60 and over.

4.4 Car ownership

The next categorisation to be considered is the number of cars owned by the household, as shown in Tables 10 and 11. In the travel survey, most trips were made by people in households with one car, but many car driver trips were also made by people from two-car households. Car passengers are most likely to come from households with one car. Short trips are more likely to be made by those from one-car households than longer trips are. Those interviewed at the in-depth stage are even more likely to come from one-car households. Conversely, relatively few trips at the in-depth interview stage come from multiple-car households. Quite a large number of car passenger trips in the in-depth survey were made by people in households where no car was owned, that is, they were being given lifts by friends or relatives.

Because of the small numbers of trips in some categories at the in-depth stage, the car ownership data are shown in further tables for three car ownership groups: 0 or 1 car, 2 cars, and 3 or more cars.

4.5 Time of day

Tables 12 and 13 show the numbers of people travelling at different times of day. There are only small differences between the three surveys. The in-depth survey has rather larger shares travelling in the early morning and evening than the travel survey. Not surprisingly, the time when there are proportionately more car drivers than passengers is the morning peak when many people are travelling to work. Conversely, there are proportionately more passengers in the evening, particularly in the in-depth survey.

Table 8 Number of trips by each age group in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
< 17	5	2114	2119	5	1709	1714	0	4	4
17-20	175	172	347	123	120	243	4	16	20
21-29	910	315	1225	623	227	850	146	42	188
30-39	2354	404	2758	1746	275	2021	560	68	628
40-49	2078	298	2376	1503	196	1699	315	34	349
50-59	1455	327	1782	995	220	1215	232	48	280
60-69	768	285	1053	556	183	739	194	27	221
70+	438	222	660	326	166	492	168	24	192
Unknown	16	5	21	11	5	16	5	0	5
Total	**8199**	**4142**	**12341**	**5888**	**3101**	**8989**	**1624**	**263**	**1887**

Table 9 Percentage of trips by each age group in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
< 17	0	51	17	0	55	19	0	2	0
17-20	2	4	3	2	4	3	0	6	1
21-29	11	8	10	11	7	9	9	16	10
30-39	29	10	22	30	9	22	34	26	33
40-49	25	7	19	26	6	19	19	13	18
50-59	18	8	14	17	7	14	14	18	15
60-69	9	7	9	9	6	8	12	10	12
70+	5	5	5	6	5	5	10	9	10
Unknown	0	0	0	0	0	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 10 Number of trips by household car ownership group in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
0 cars	37	365	402	24	290	314	1	60	61
1 car	3880	2291	6171	2885	1759	4644	1097	155	1252
2 cars	3486	1292	4778	2440	922	3362	423	48	471
3 cars	646	143	789	421	98	519	88	0	88
4 cars	111	48	159	85	30	115	11	0	11
5 cars	39	3	42	33	2	35	4	0	4
Total	8199	4142	12341	5888	3101	8989	1624	263	1887

Table 11 Percentage of trips by household car ownership group in the surveys

	Travel survey - all trips			**Travel survey - all short trips**			**In-depth survey trips**		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
0 cars	0	9	3	0	9	3	0	22	3
1 car	47	55	50	49	57	52	68	59	66
2 cars	43	31	39	41	30	37	26	18	25
3 cars	8	3	6	7	3	6	5	0	5
4 cars	1	1	1	1	1	1	1	0	1
5 cars	0	0	0	1	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100

Table 12 Number of trips at various times of day in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Before 0700	114	14	128	67	8	75	29	0	29
0700 - 0959	1613	654	2267	1168	530	1698	298	29	327
1000 - 1559	3319	1794	5113	2427	1309	3736	674	112	786
1600 - 1859	1901	994	2895	1326	723	2049	357	52	409
After 1859	1252	686	1938	900	531	1431	266	70	336
Total	**8199**	**4142**	**12341**	**5888**	**3101**	**8989**	**1624**	**263**	**1887**

Table 13 Percentage of trips at various times of day in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
Before 0700	1	0	1	1	0	1	2	0	2
0700 - 0959	20	16	18	20	17	19	18	11	17
1000 - 1559	40	43	41	41	42	42	42	43	42
1600 - 1859	23	24	23	23	23	23	22	20	22
After 1859	15	17	16	15	17	16	16	27	18
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

4.6 The five areas

The final comparison to be made at this stage is between the five areas, as shown in Tables 14 and 15. The number of trips shown reflect the number of people interviewed, as was shown in Table 2. Dorset has a smaller share of short trips than longer trips in the travel survey, reflecting the dispersed nature of this rural area while the other areas have proportionately slightly more short trips.

There are some differences between the in-depth survey and the pattern of short trips in the travel survey, with proportionately more in the in-depth survey in Leeds, London and Hereford and fewer in Ipswich and Dorset. This may reflect differences between the success of the various interviewers in obtaining responses at the in-depth stage.

4.7 Differences between the surveys

Overall there are some differences between the trips in the in-depth survey and those they were selected from. The former are over-represented in commuting and shopping for both drivers and passengers, and for escort trips for drivers, and employers' business and eating and drinking for passengers. The overall distribution between the sexes is close to the values for short trips in the travel survey, but males are considerably under-represented as passengers. The very young are under-represented because they were excluded from the in-depth survey. The elderly and those aged 30 to 39 are over-represented, possibly because of greater availability for interview. Trips from multiple car-owning households are under-represented in the in-depth survey while car passenger trips from non-car owning households are over-represented. Trips at the beginning and end of the day are slightly over-represented. There are some differences between the numbers of trips in the five areas, reflecting the difficulty of finding people to interview in London and the different levels of determination of the interviewers.

These types of differences are bound to occur when data are examined in a range of dimensions. The aggregation of some of the headings for analysis removes some of the problems of dealing with small numbers. Overall, it is clear that the short car trips made by the 377 people interviewed cover a wide range of types of trip, and provide an interesting data base for further investigation.

The analysis will now focus on car drivers who will be examined in terms of the reasons why they drive, the alternatives which they perceive and what would make them switch to the alternatives. This is followed by a briefer discussion about car passengers.

Table 14 Number of trips in the five areas in the surveys

	Travel survey - all trips			Travel survey - all short trips			In-depth survey trips		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
London	606	444	1050	457	374	831	147	40	187
Leeds	1962	1006	2968	1439	787	2226	491	107	598
Ipswich	1736	962	2698	1286	757	2043	333	20	353
Hereford	1610	624	2234	1307	529	1836	372	43	415
Dorset	2285	1106	3391	1399	654	2053	281	53	334
Total	**8199**	**4142**	**12341**	**5888**	**3101**	**8989**	**1624**	**263**	**1887**

Table 15 Percentage of trips in the five areas in the surveys

	Travel survey - all trips			**Travel survey - all short trips**			**In-depth survey trips**		
	Car drivers	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**	**Car drivers**	**Car passengers**	**Total**
London	7	11	9	8	12	9	9	15	10
Leeds	24	24	24	24	25	25	30	41	32
Ipswich	21	23	22	22	24	23	21	8	19
Hereford	20	15	18	22	17	20	23	16	22
Dorset	28	27	27	24	21	23	17	20	18
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

5 WHY DO CAR DRIVERS DRIVE?

5.1 The purpose of the trip

The first issue to be considered in the analysis of the results is why do car drivers drive. The first way to consider this is in terms of the purpose of the trip, as shown in Table 16. Later the issue will be considered in terms of the reasons for using the car.

Table 16 Purposes of trips made by car drivers in the surveys

Trip purpose	Number	Percentage
Commuting	203	13
Business	23	1
Education	3	0
Escort to education	74	5
Shopping	197	12
Other escort	207	13
Personal business	82	5
Social	205	13
Home	563	35
Change mode	67	4
Total	**1624**	**100**

It can be seen that `home' is the purpose with the highest number of trips associated with it. Four trip purposes, `Commuting', `Other escort', `Social' and `Shopping' each have about 12 or 13% of the trips. Of the 203 commuting trips, 23 are to jobs other than the main one. Of the 205 social trips, 90 are visits to friends and 15 are trips for eating and drinking. It is interesting how many trips are classified as `Other escort', given that this excludes taking children to school, and only car drivers are being considered here.

`Personal business', `Escort to education' and `Change mode' all have about 4 or 5% of the trips. The 82 `Personal business' trips include 11 to the doctor or dentist. Business trips only make up about 1% of these trips. `Education', which is being shown separately here, is very small because, by definition, car drivers must be aged 17 or more.

In the sample 18% of car driver trips are escort trips simply being made to take other people to activities.

It is interesting to compare the distribution between trip purposes here with that in the National Travel Survey (NTS). Table 17 shows the distribution from these surveys, with `home' and `change mode' removed as categories since these are not used in NTS, compared with equivalent trips from NTS for car driver trips of less than five miles.

Table 17 Comparison of the distribution of car driver trips between trip purposes in the Short Trips Survey and the National Travel Survey, 1995/97

Trip purpose	**Short Trip Survey**	**NTS 1995/97**
Commuting	13	11
Business	1	3
Education	0	0
Escort to education	5	4
Shopping	13	13
Other escort and personal business	19	14
Social	13	13
Home	36	42
Total	**100**	**100**

Source for NTS 1995/97 data: Special tabulations from the 1995/97 National Travel Survey

The distributions are similar. The Short Trip Surveys have more commuting trips, escort to education and other escort and personal business trips, but fewer trips to home. These differences may partly reflect the fact that NTS covers the whole country and the surveys take place all year round whereas the Short Trips Surveys were clustered in five areas and took place in the second half of the year.

5.2 Reasons why the car was used

The data from the in-depth survey have been coded to identify the reason why people drove their cars. Many respondents gave more than one reason. Overall, the respondents gave a total of 2707 reasons for the 1624 trips, a mean of 1.7 each. The reasons have been weighted by the inverse of the number of reasons given in order to prevent bias towards drivers who gave more than one reason for using the car. Table 18 shows the total and weighted number of reasons in descending order for the total number of reasons. Reasons which are a smaller percentage for the weighted reasons than the total ones are the reasons which tended to be given by those giving multiple reasons. The reasons shown here are based upon coding of the text from the in-depth interviews.

Table 18 Total numbers of reasons given for driving the car

Reason for using car	Total		Weighted	
	Number	%	Number	%
It was a long way	525	19	320	20
I had heavy goods to carry	395	15	228	14
I was short of time	368	14	206	13
I was giving a lift to a family member or friend	342	13	199	12
The weather was bad	205	8	120	7
It was convenient	163	6	149	9
I needed the car for a further trip	150	6	105	6
It was dark out	148	5	74	5
I was on a social trip	137	5	75	5
I needed my car at work	110	4	54	3
I was taking an elderly or ill person	49	2	32	2
It was an unpleasant environment to travel through	45	2	19	1
I felt unwell	41	2	21	1
I cannot manage without my car	20	1	17	1
I was taking the dog for a walk	9	0	6	0
Total	**2707**	**100**	**1624**	**100**

The most popular answer was `It was a long way' which might seem curious given that these are all regarded as short trips, but the trips could be up to five miles long. The second most popular reason was carrying heavy goods, usually shopping. The third most important factor was shortage of time. Other popular reasons for using the car were giving lifts to others, bad weather and convenience.

It is clear from the table that the respondents were able to give a variety of reasons which were all valid, at least as far as they were concerned: some observers might regard using the car to take the dog for a walk or claims that the driver could not manage any other way with some scepticism.

It is immediately obvious that there are some trips by car that it would be difficult to do much about, for example those where the car was used because of bad weather, whereas if it was simply used out of convenience, then it may be possible to use an alternative. This is a topic to be analysed further below.

This analysis is very interesting, but it is not completely satisfactory because there is some overlap between the reasons arising from the method of obtaining the information (coding unstructured text). Some of the reasons are more specific than others. For example, if someone was coded as using the car because they needed it at work and because it was convenient, it seems reasonable to assume that the former reason was the dominant: it was the need to use the car at work that determined the use of the car, not just the convenience. More importantly, it is the need to be able to use the car at work that influences whether there are alternatives to the car. Hence it is important to identify the main reason why the car was used.

5.3 Establishing the main reason for driving

The potential alternatives to the car that each respondent identified were noted. The respondents mentioned a total of 2929 alternatives for the 1624 trips. In 400 cases these were mentioned negatively: for example there was the woman in London who said:

> *Don't like public transport.*

which would have been coded as `Public transport', but with a low probability of being adopted. It does not seem sensible to include alternatives mentioned in this way. Excluding these left a total of 2529 alternatives, an average of 1.6 for each trip. It is important in the analysis not to give extra weight to those car drivers who happened to mention more alternatives, so it is necessary to combine them. They have been combined in the cases where more than one alternative was mentioned in the same way as the reasons, as discussed above, using the reciprocals of the number of alternatives identified as weights. This method means that the sum of the alternatives is 1624. It also implies that each alternative identified by a respondent is regarded as equally likely.

Despite considerable prompting by the interviewers some people were unable to identify any alternatives. Since each trip had one or more reason associated with it, it is possible, for each reason, to calculate the proportion of car driver trips for which the respondents were unable to identify any alternative. It seems reasonable to assume that fewer car drivers who could switch to an alternative for a particular reason, the greater the likelihood that it is an important reason for using the car. These rankings are illustrated in Table 19, which shows the number and proportion of weighted car driver trips for which the respondents could identify no alternative, ranked in descending order.

The rankings shown in Table 19 have been used to identify the main reason for using the car. If a respondent gave more than one reason, the reason with the highest ranking (that is the lowest probability of change) was classified as the main reason. So, if a respondent gave `needing the car at work' and `carrying heavy goods' as the reasons, this has been classified as `needing the car at work'. This is logical because they probably would have had to use the car even if they did not have to carry heavy goods. On the other hand, if a respondent said that they were using the car because they had to carry heavy goods and because they felt unwell, this is classified as `carrying heavy goods': they would have had to carry them even if they had been well that day, and so would have used the car.

Table 19 Classification and ranking of reasons for driving the car

Reason	Total number giving this reason	Number with no alternative	% of total	Ranking
I needed my car at work	53.5	32.0	59.8	1
I cannot manage without my car	16.5	8.0	48.5	2
I needed the car for a further trip	105.1	22.7	21.6	3
I was taking an elderly or ill person	31.5	6.5	20.6	4
It was convenient	149.2	27.0	18.1	5
I had heavy goods to carry	227.9	32.2	14.1	6
I was giving a lift to a family member or friend	199.0	16.0	8.0	7
It was dark out	74.3	5.0	6.7	8
I was short of time	206.0	13.2	6.4	9
I was on a social trip	75.3	2.0	2.7	10
The weather was bad	119.8	2.5	2.1	11
It was a long way	320.2	5.0	1.6	12
I felt unwell	21.1	0.0	0.0	13
It was an unpleasant environment to travel through	18.7	0.0	0.0	14
I was taking the dog for a walk	6.0	0.0	0.0	15

Table 20 shows the 1624 car driver trips classified by the main reason for driving by car. It will be noticed that `It was an unpleasant environment to travel through' has a value of zero. This means that everyone who gave this reason gave at least one other reason and that was more significant. Hence this reason will be dropped from the analysis. The table shows a list of short versions of the reasons. These will be used from now on in the tables.

Table 20 Main reasons for driving the car

Reason for using car	Short reason	Number	%
I had heavy goods to carry	Heavy goods	304	19
I was giving a lift to a family member or friend	Lift for family	268	17
I was short of time	Short of time	184	11
It was a long way	Long way	180	11
It was convenient	Convenience	163	10
I needed the car for a further trip	Further trip	147	9
I needed my car at work	Needed for work	89	5
The weather was bad	Bad weather	75	5
It was dark out	Dark out	73	4
I was on a social trip	Social	67	4
I was taking an elderly or ill person	Taking old or ill	43	3
I cannot manage without my car	Car essential	20	1
I felt unwell	Felt unwell	8	0
I was taking the dog for a walk	Walking the dog	3	0
It was an unpleasant environment to travel through	Unpleasant route	0	0
Total		**1624**	**100**

5.4 Why people say they drive their cars

As Table 20 shows, carrying heavy goods is the most common main reason for driving the car on a short trip. In many cases this is shopping, but there are other types of goods to be carried. For example, a 63-year old man from Dorset said:

> *Could have walked I suppose. I had a mower in the car for both journeys so I had to take the car. I could have combined it with another journey I suppose but it's just down the road: I have to look after the cricket pitch.*

However, talking about another short trip he said:

> *Look, I know walking is better for you but I've always used the car: it's easier, cheaper and just so much more convenient.*

The latter trip was classified as `I cannot manage without my car' in Table 20 (now abbreviated to `Car essential'). Clearly in the first case, if he did not need to take the mower he would not have made the journey at all, so his use of the car can be regarded as reasonable, but in the second case it is clear that he regards the car as his normal mode of travel even for short trips. (The irony of someone who is prepared to put effort into mowing the cricket pitch but always uses the car even for very short trips is interesting).

There are a number of other examples of people using their cars for reasons that might be regarded as rather trivial looked at objectively, but are regarded as reasonable by those making the trips: for example, a respondent in Leeds said:

> *I really wanted these homemade sausages as they are special - X's (well-known shop) sausages are not so good.*

On a similar theme, a woman from Leeds said:

> *Could have walked to X (well-known shop) which is nearer but I don't like their champagne and it was special for my husband's birthday the next day.*

She also said:

> *Could have walked but it was dark. It is quite a long way - dangerous at night.*

This illustrates the multiplicity of reasons given for using the car. In this case the darkness would have been regarded as the main reason with the length of the journey and the desire for a particular type of champagne regarded as secondary.

Using the car to take the dog out for a walk might be regarded as a poor reason for using the car, but the particular respondents might not agree. A woman from Leeds said:

> *I could have walked but it's easier to keep the dog under control in the car.*

Similarly a man, also from Leeds, said:

> *There isn't an open space nearby that we could safely go where the dog can have a good run. The dog doesn't go on a lead and Avenue Lane is too busy and dangerous for it to walk next to. I would not take the dog on a bus.*

It is clear from Table 20 that giving lifts to other people is a significant generator of short car trips. In 16% of cases a lift was being given to a family member or friend and in a further 2% of cases a lift was being given to an elderly or ill person. In many cases the former are parents taking their children to school, for example the woman aged 34 from Leeds who said:

> *I don't walk because Jonathan is a bit grumpy and I have to virtually drag him.*

This woman also had time constraints:

> *If I walk both ways I don't have much time at home to do jobs before I have to go back again for Jonathan. I do sometimes walk in summer when the weather is nice.*

Time constraints were third on the list of reasons for using the car. This illustrates two of the main benefits of using the car: it is there when you need it and it is fast. For example a household from Leeds were making a trip to church and said:

> *We had a lie in, so there was not enough time to walk. If it was a nice day and we didn't leave it too late, we would walk.*

Another interesting example of a time constraint is the person who said:

> *It is the nearest place to buy a nice take-out sandwich: we work on an industrial estate with only grotty greasy spoon cafes. These is a pub nearer but they do not do take-out and we work at our desks as we eat.*

Similarly, another woman in Leeds said:

> *We could have walked if we'd had more time, but we nipped there quickly whilst my other daughter was having a guitar lesson. The Blue Pineapple has some good value cards and presents and my daughter wanted to choose them herself.*

The length of trip is fourth on the list of main reasons. As discussed above, some of these trips are nearly five miles long and it is perfectly conceivable that people regard that as too far to walk, they cannot cycle and there is no suitable public transport.

There are three cases where use of the car is seems eminently sensible: where there is a particular physical need, where effort is being made to be efficient by linking trips together, and where the trip is particularly complex. For example, a male respondent aged 72 from Leeds said:

> *I can't walk that far due to my medical condition*, and
>
> *Neither of us can use public transport due to our disabilities*

Similarly, another elderly man from Leeds said:

> *Not worth a bus - too short a journey and would still require two walks, uphill coming back; I'm aged 81.*

This person also demonstrated environmental awareness:

> *Only a very short journey, but the car was warm and it was handy to run her up to the bus stop.*

The Leeds man who used his car to take the dog out, recognised the benefits of linking trips:

> *The Post Office is near enough to walk or cycle but as I was going further and it was on my way I stopped off in the car. If I use my car, I always try to link trips together.*

Many people use their cars for linked trips without necessarily regarding it as an issue: it simply reflects their way of life. For example, a woman living in London made a journey which included taking her child to school, shopping and personal business. Her reasons for using the car were multiple:

I could walk to the video shop, but it is hard work with a pushchair so I don't do it. I don't like public transport for short journeys: it's too difficult with children. I need the car to carry the shopping. I do my own shopping because I like to browse. I would get delivery service but I rarely know what I want until I'm in the shop.

There are examples of people who always use their cars as well as the man from Dorset who mows the cricket pitch. For example, a 58 year old man from Dorset stated:

There aren't any buses and I wouldn't use them anyway - I have my car to use.

Similarly, a man aged 66 living in London said:

I could walk, but I always use the car as it is heaps easier.

It is worth mentioning that there are some examples of short car trips being generated by the car: in Ipswich one man made a trip just to fill the car up with petrol, while in Hereford a woman needed to take the car to drive it through the car wash, and in Dorset a woman made a half mile car journey to obtain a motor vehicle licence from the Post Office.

5.5 The reasons by trip purpose

It is possible to examine the reasons why people used their cars for the various trip purposes individually, as shown in Table 21. This table shows for each trip purpose, the reason why the car was used in percentage terms. The number at the bottom of the column is the number of trips in this category. The larger the number the greater the confidence that can be placed upon the figures in the column. Each column can be compared with the total in the last column to see which reasons deviate from the overall figure. For example, for work trips, the most important reason was that the car was needed for work (28% compared with 5% overall). These trips are unlikely to be easy to shift from car. Shortage of time was also fairly important, presumably reflecting people running late in the morning but wanting to be on time for work.

For business trips, the car was perceived as being necessary carrying out the work function (26%), while in 22% of cases it was required for a further trip: these are cases of people making some form of trip circuit such as a doctor visiting patients. For shopping trips, the dominant reason for using the car is because of the need to carry heavy goods, which partly reflects the nature of much food shopping where the car is driven to the local suburban or out-of-town supermarket which provides good parking space and means that all the household's regular shopping needs can be met in one trip. The car in intrinsic to such trips.

Table 21 Main reasons for driving the car by trip purpose (%)

Reason for using car	Work	Business	Shopping	Escort to education	Other escort	Personal business	Social	Change mode	Home and education	Total
Heavy goods	8	9	36	5	9	18	19	21	22	19
Lift to family	6	4	8	55	35	11	11	9	15	17
Short of time	20	9	9	16	8	9	7	6	12	11
Long way	6	4	15	5	11	11	14	7	12	11
Convenience	14	13	9	3	6	7	14	16	10	10
Further trip	9	22	8	7	10	15	12	10	7	9
Needed for work	28	26	2	1	2	1	0	3	2	5
Bad weather	4	4	6	3	1	11	3	6	5	5
Dark out	2	4	2	1	6	4	7	3	5	5
Social	0	0	2	1	4	4	10	9	5	4
Taking old or ill	0	4	3	1	7	0	1	6	2	3
Car essential	1	0	2	0	0	5	0	3	1	1
Felt unwell	0	0	1	0	0	4	0	0	1	0
Walking the dog	0	0	0	0	0	1	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100
Number	203	23	197	74	207	82	205	67	566	1624

For escort trips, it is the needs of a person other than the driver which are being met. This is true for education escort trips, where giving a lift to another person was cited as the reason for using the car in 55% of cases. Shortage of time was also important here: presumably in some households, the child was slow in getting up and so the parent had to use the car to ensure the child reached school on time. In some cases the car was being used for a further trip. An example of this would be a child is being dropped off at a friend's house by a parent on his or her way to another activity such as shopping.

Personal business trips are slightly unusual because the car was used much more than average for three specific reasons: bad weather, not being to manage without the car and because of feeling unwell. The first and third of these suggest that these trips had to be made for personal reasons despite the adverse circumstances, so the car was used. Some of those making trips because they felt unwell might have been going to the doctor. For social trips, some people used their cars simply because it was a long way or for convenience. Others were making a further trip, suggesting some complex trips, perhaps involving visiting several locations such as a cinema and a restaurant. Many social trips are made in the evening, and being dark was the reason for using the car for more than the average number of reasons.

`Change mode' means trips such as driving to the station. In 21% of cases this was because of luggage, while 16% compared with an overall value of 10% recognised it was just a matter of convenience. There are many home and education trips (nearly all the former) and the distribution between reasons is close to the overall values.

5.6 The reasons by trip length

It has already been implied that some of these trips are quite long (up to five miles) and so it is worth investigating whether there are variations in the reasons for driving the car for trips of different lengths. Table 22 shows why car drivers drive for trips of less than one mile, trips of one to two miles and trips of two to five miles. The differences are not huge. Carrying heavy goods is relatively less significant for longer trips. This is because the car has to be used however long the trip, but the other reasons are less significant for short trips. For example, both being a long way and being short of time are given as reasons for more trips of over two miles than shorter trips. Giving a lift to a family member or friend is high for trips of between 1 and 2 miles. For very short trips many children will walk or cycle while transport is provided for travel to school over three miles, hence the peak in this distance band. Many of the other factors, such as needing the car at work, bad weather, darkness, social reasons and taking an elderly or ill person, are independent of distance.

As discussed above, there may not be alternatives for the longer of these short trips, but it can be seen that 286 out of the 1624 trips being considered here are less than one mile long. Most adults could walk such a distance, so it is interesting to investigate these trips in more depth. Table 23 shows the main reasons for driving the car for each trip purpose for rips of less than one mile. It should be recognised that there are very few trips in some categories (business and change mode) so these will not be discussed further.

It is interesting to compare these values with those in Table 21. The reasons which have higher values than those in Table 21 for all trips combined are carrying heavy goods, convenience, being dark out, feeling unwell, and car essential. These are all trips for which the car use is not a function of distance, hence the disproportionate use for very short trips.

Table 22 Main reasons for driving the car by distance (%)

Reason for using car	<1 mile	1 to < 2 miles	2 to < 5 miles	Total
Heavy goods	22	18	18	19
Lift for family	17	19	15	17
Short of time	11	10	12	11
Long way	8	10	13	11
Convenience	13	6	11	10
Further trip	6	10	9	9
Needed for work	5	6	5	5
Bad weather	4	5	5	5
Dark out	4	6	4	4
Social	3	4	4	4
Taking old or ill	3	3	3	3
Car essential	2	1	1	1
Felt unwell	1	0	0	0
Walking the dog	0	1	0	0
Total	**100**	**100**	**100**	**100**
Number	**286**	**497**	**841**	**1624**

For the very short work trips, 50% were because the car was needed for work, compared with 28% for all short trips. For shopping, carrying heavy goods is even more important for very short trips than slightly longer ones, as would be expected. Interestingly, for escort to education trips, running out of time is much more significant than for the longer trips: as implied above, in many cases this is probably due to children who are likely to be late for school being rushed there by car. For very short personal business trips, the car tends to be used more than on slightly longer trips because of the need to carry heavy goods, taking the elderly or ill, or because the driver cannot use an alternative. For very short social trips, carrying heavy goods is more important than on longer trips. It is not immediately obvious why this is: they could be bottles for parties. Convenience is important, suggesting that some people use their cars for short local social trips simply because they cannot be bothered to use the alternatives. Some of these trips may involve taking young children or elderly relatives.

Table 23 Main reasons for driving the car by trip purpose for trips of less than one mile (%)

Reason for using car	Work	Business	Shopping	Escort to education	Other escort	Personal business	Social	Change mode	Home and education	Total
Heavy goods	5	20	40	14	8	24	29	22	24	22
Lift for family	5	0	5	36	46	10	3	22	14	17
Short of time	5	20	7	36	12	10	12	0	10	11
Long way	9	0	2	7	10	5	6	0	14	8
Convenience	14	40	16	7	8	5	21	11	11	13
Further trip	9	0	2	0	4	10	9	0	7	6
Needed for work	50	20	0	0	2	0	0	22	0	5
Bad weather	0	0	7	0	0	10	6	0	6	4
Dark out	0	0	5	0	4	5	9	0	5	4
Social	0	0	5	0	4	0	3	0	5	3
Taking old or ill	0	0	5	0	4	0	3	0	5	3
Car essential	5	0	7	0	0	10	0	11	5	2
Felt unwell	0	0	2	0	0	5	0	0	2	1
Walking the dog	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100
Number	22	5	43	14	50	21	34	9	88	286

This examination of very short trips suggests that there are some trips for which it would be very difficult to find an alternative. However, these are the minority of this type of trip.

5.7 The reasons by sex and age

It may be instructive to see who uses the car for short trips. Table 24 shows the main reasons for using the car for males and females. It shows that men are more likely to be car drivers than women because their journeys are longer (or so they perceive), out of convenience, because they need the car at work or because of bad weather. On the other hand, women are more likely to be using the car because they are giving a lift to a family member or friend, because they need the car for a further trip or because it is dark. Most of these, if not all, are, as one would expect: women are more likely to take the children to school, and feel vulnerable after dark. Those who believe that they cannot manage without their cars are more likely to be men, but the numbers are small. Some of these are elderly people who are unable to walk far. Amongst the elderly there are many more men who can drive than females.

Table 24 Main reasons for driving the car by sex (%)

Reason for using car	**Male**	**Female**	**Total**
Heavy goods	19	18	19
Lift for family	12	21	17
Short of time	11	12	11
Long way	14	8	11
Convenience	12	9	10
Further trip	8	10	9
Needed for work	7	4	5
Bad weather	6	4	5
Dark out	2	7	4
Social	4	5	4
Taking old or ill	3	3	3
Car essential	2	1	1
Felt unwell	1	0	0
Walking the dog	0	0	0
Total	**100**	**100**	**100**
Number	**796**	**828**	**1624**

Similarly, the reasons why people of different age groups are likely to use the car can be examined in Table 25. The youngest group are more likely than average to use their cars for the sake of convenience or because they need it for a further trip. The latter may be largely mothers of young children making complex trips to school and shops, for example. The young are also more likely to believe that they cannot manage without their cars. On the other hand, the elderly are more likely to use their cars because of the need to carry heavy goods, the distance involved or bad weather. They are much less likely to be giving a lift to a family member or friend, but more likely to be taking an elderly or ill person or be on a social trip.

Table 25 Main reasons for driving the car by age group (%)

Reason for using car	**17-29**	**30-59**	**60+**	**Total**
Heavy goods	13	19	20	19
Lift for family	16	19	10	17
Short of time	9	14	4	11
Long way	13	10	15	11
Convenience	13	9	10	10
Further trip	13	9	9	9
Needed for work	1	7	2	5
Bad weather	7	3	8	5
Dark out	3	5	3	4
Social	4	2	10	4
Taking old or ill	4	1	6	3
Car essential	3	1	2	1
Felt unwell	1	0	1	0
Walking the dog	0	0	0	0
Total	**100**	**100**	**100**	**100**
Number	**150**	**1107**	**362**	**1624**

Note: There are 5 cases where the age is not known.

5.8 The reasons by car ownership level

It can be argued that there are some short trips for which use of the car is justified and others for which it is a relative luxury, used largely because it is there. This can be observed when the number of car owned is considered as an explanatory factor, as shown in Table 26. Trips made by those living in households with three or more cars tend to be for less important reasons such as convenience and being short of time, whereas those with only one car tend to use it more for understandable reasons such as carrying heavy goods, giving a lift darkness or feeling unwell. This implies a much higher degree of car dependency amongst those with low car ownership. In these households when the car is used it is used largely out of perceived necessity. It also implies that some third and fourth cars are used for some fairly trivial reasons. It is an interesting question as to whether they would have made the trip by car if they had fewer cars: it may well be the availability of a car which is not likely to be required by another family member means that it is more likely to be used simply because it is there.

5.9 The reasons by time of day

It is interesting to examine temporal and spatial differences in the reasons why people drive cars for short trips because this may help to identify the potential for shifting them. Table 27 shows the pattern through the day. To some extent the temporal variations reflects the differences in trip purposes. They also reflect the different availability of the alternatives, particularly public transport which offers a poorer service early in the morning and in the evening. Before 7.00 am the main reason for using the car is because it is needed at work. This reflects the large number of work trips at this time. Giving a lift to members of the family or friends is also high at this time. This may partly reflect the undesirability of walking and cycling before it is light. It can also be seen that 10% of the trips have been classified as having car use essential. There simply may be no realistic alternative. In the morning peak period (0700 to 0959), giving lifts to family and friends is popular, reflecting the need to take children to school. Shortage of time is also important here, reflecting the need to reach work and school on time. Such constraints are much less significant in the evening peak. In the interpeak period from 1000 to 1559, the influence of shopping trips can be seen in the use of the car because of the need to carry heavy goods. This is the period when the car is most used because it is needed for further trips, reflecting the complexity of some trips, for example to a number of shops and similar. People making trips at this time are most sensitive to bad weather, possibly reflecting the fact that many of these trips are by the elderly who are the people most likely to use their cars because of the weather. In the evening peak, darkness is a major factor. It is even more significant after 1900. At this time giving a lift to family and friends is also important: in many cases this is parents taking their children to social events and collecting them afterwards.

Table 26 Main reasons for driving the car by number of cars owned (%)

Reason for using car	**0 or 1 car**	**2 cars**	**3+ cars**	**Total**
Heavy goods	18	24	9	19
Lift for family	19	14	3	17
Short of time	9	15	21	11
Long way	10	12	14	11
Convenience	10	8	18	10
Further trip	8	9	17	9
Needed for work	6	4	9	5
Bad weather	5	5	2	5
Dark out	5	4	0	4
Social	5	3	1	4
Taking old or ill	3	2	2	3
Car essential	1	0	6	1
Felt unwell	1	0	0	0
Walking the dog	0	0	0	0
Total	**100**	**100**	**100**	**100**
Number	**1098**	**423**	**103**	**1624**

Note: There was only one case of a driver from a household with 0 cars; in this case the main reason for its use was the fact a car had been lent (classified under `It was convenient' here)

Table 27 Main reasons for driving the car by time of day (%)

Reason for using car	Before 0700	0700-0959	1000-1559	1600-1859	After 1859	Total
Heavy goods	10	14	23	22	11	19
Lift for family	24	21	13	15	21	17
Short of time	3	15	12	11	7	11
Long way	3	9	12	13	10	11
Convenience	14	12	9	9	12	10
Further trip	0	7	12	8	5	9
Needed for work	28	9	3	5	6	5
Bad weather	3	4	6	3	3	5
Dark out	3	1	0	8	15	4
Social	0	3	5	4	5	4
Taking old or ill	0	1	3	1	5	3
Car essential	10	1	1	1	1	1
Felt unwell	0	1	0	1	1	0
Walking the dog	0	1	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**29**	**298**	**674**	**357**	**266**	**1624**

5.10 The reasons by area

Table 28 shows the reasons why people use their cars in the five areas. The areas were selected to reflect different levels of urbanisation ranging from London at one end of the spectrum to Dorset which is rural. Several of the variables show fairly systematic variations across the range. Giving a lift to family and friends, and being short of time tend to decrease as factors with increasing rurality while distance and social reasons tend to increase with rurality. The latter pair of factors reflects the need to travel further to meet some needs in rural areas. In areas of higher density it is possible to reach, for example, shops and schools more easily. The greater influence of shortage of time in urban areas may reflect a more intensive lifestyle in such areas. The need to carry heavy goods as a factor influencing car use increases with greater rurality, with the exception of London which has an average value. This may well reflect different levels of accessibility to shops: in urban areas it is fairly easy to use alternative modes such as bus or walk to reach the shops (and parking may be difficult), while in rural areas, shops are further away so the car is more likely to be used.

Table 28 Main reasons for driving the car by area (%)

Reason	London	Leeds	Ipswich	Hereford	Dorset	Total
Heavy goods	20	12	16	20	30	19
Lift for family	22	18	18	15	12	17
Short of time	22	11	14	9	5	11
Long way	5	9	10	15	15	11
Convenience	11	12	5	11	11	10
Further trip	4	8	18	9	3	9
Needed for work	2	12	2	3	4	5
Bad weather	1	4	11	3	1	5
Dark out	4	7	3	4	3	4
Social	1	3	2	5	10	4
Taking old or ill	3	2	0	5	2	3
Car essential	0	2	1	1	3	1
Felt unwell	4	0	0	0	0	0
Walking the dog	0	0	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**147**	**491**	**333**	**372**	**281**	**1624**

5.11 Conclusions on the reasons why people drive cars

This section has examined the reason why people drive their cars. It has been shown that the main reasons people use their cars for short car trips are to carry heavy goods, to give lifts to members of their family and friends, because they are short of time, because of the length of the journey, out of convenience, and because the car is needed for a further trip. There were some other very interesting reasons given in a small number of cases such as avoiding walking after dark and because of illness. All the reasons are plausible, although some might regard using the car to take the dog for a walk as an extravagance.

When the reasons are considered in terms of particular trip purposes, these all make sense. For example, the car is often used for trips to work because it is needed there and because of time constraints. It is also because many work journeys are made early when public transport is not a reasonable alternative. The car is often used for shopping trips because of the need to transport heavy goods, and to take children to school because the household is running late.

There are differences in the use of the car for short trips between the sexes and age groups and across the day, but these largely reflect the different mixes of trip purposes. For example, men tend to use

the car because they need to use it during the working day, while women are more likely to be taking children to school. Those living in households with several cars seem to use their cars more out of convenience than those with only one car who tend to be much more dependent on that car, for example to carry heavy shopping.

There are some interesting differences across the five areas in the reasons the car is used, with use of the car because of time constraints and to give lifts to members of the family and friends higher in urban areas, while car use for social reasons and because of the distance involved increases with increasing rurality.

Having examined why the car is used for short trips, the next stage is to consider how likely drivers are to reduce their use of the car.

6 HOW LIKELY ARE DRIVERS TO REDUCE THE USE OF THEIR CARS FOR SHORT TRIPS?

6.1 The method of calculating the likelihood of reducing car use for short trips

Having considered why people drive cars, it is appropriate to consider which types of trips are most likely to be switched from car use. This can only be done in relative terms, because there is no information from the surveys on how likely people are to stop using their cars. However, if information about the total number of car drivers making short trips who might stop using their cars were available from some other source, it would be possible to estimate which types of trip are more likely to switch from the information here.

In order to form a basis for these calculations, the various reasons that the drivers are using their cars have been allocated a likelihood of switching from the car, as shown in Table 29.

Table 29 Allocation of reasons for driving the car to bands of likelihoods of reducing car use

Reason	**% with no alternative**	**Likelihood of reducing car use**	**Weighting given**
No alternative to car	100.0	Very low	1
Needed for work	59.8	Low	2
Car essential	48.5	Low	2
Further trip	21.6	Quite low	3
Taking old or ill	20.6	Quite low	3
Convenience	18.1	Quite low	3
Heavy goods	14.1	Quite low	3
Lift for family	8.0	Moderate	4
Dark out	6.7	Moderate	4
Short of time	6.4	Moderate	4
Social	2.7	Quite high	5
Bad weather	2.1	Quite high	5
Long way	1.6	Quite high	5
Felt unwell	0.0	High	6
Unpleasant route	0.0	High	6
Walking the dog	0.0	High	6

The likelihoods range from `very low' for trips for which the respondent could not identify any alternatives irrespective of the reason for use of the car, to `high' for trips for which all car drivers could identify one or more alternatives. The reasons have been allocated to the likelihood bands by grouping them according to the proportions of car drivers who stated that they had no alternative. It can be seen that the values allowed this to be done in a reasonably unambiguous way.

In order to combine the various likelihoods it is necessary to put weightings on them. In the absence of other information the simplest possible method has been used. This involves the allocation of a value of 1 to trips to which no alternatives were identified to 6 for those for which everyone could identify an alternative. It should be recognised that these values are arbitrary, but they do enable comparisons to be made. Different values which have the same sequence would make marginal changes to the totals, but would have to be very different to make significant changes to the findings shown by these tables.

Weighted averages are calculated and shown as the `score' in the following tables. In order to show the relative impacts the ratios of these to the overall average value of 3.18 are shown as the `score ratio'. The higher the value of the score and the score ratio the more likely that type of trip could be switched away from car use.

It should be borne in mind that the basis for this is that the likelihoods are aggregations of the reasons why people use their cars, and the likelihood of reducing car use for each reason was based on the proportion of people giving that reason who could identify alternatives to the car: it is assumed that the more people who could identify alternatives, the more likely people giving that reason are to be able to switch from using it.

6.2 The likelihoods by trip length

Table 30 shows the percentages in each likelihood band for each of the distance bands. It can be seen that the longer trips are more likely to be switched from the car. This is because, in many cases, the car is used for very short trips because it is essential: for example to carry a heavy load, rather than as a matter of convenience. This is reflected in the higher proportion of trips of less than one mile for which there is no alternative than the other categories.

Table 30 Likelihood of reducing car use by trip length (%)

Likelihood	<1 mile	1 to < 2 miles	2 to < 5 miles	Total
High	1	1	0	1
Quite high	12	16	19	17
Moderate	31	31	28	30
Quite Low	31	27	29	28
Low	2	5	3	3
Very low	23	21	21	22
Total	**100**	**100**	**100**	**100**
Number	**286**	**497**	**841**	**1624**
Score	3.08	3.18	3.21	3.18
Score ratio	0.97	1.00	1.01	1.00

6.3 The likelihoods by trip purpose

Much bigger differences can be seen when the trips are disaggregated by trip purpose, as shown in Table 31. The trips which it would be most difficult to switch away from the car are business and work trips, while the easiest would be escort to education trips. Others with an above average likelihood of change are personal business and other escort. For work and business trips this low likelihood of switching partly reflects the high proportions unable to identify an alternative. In some cases this is because the journeys are being made at inconvenient times of day or because the car is needed as part of the job.

6.4 The likelihoods by sex and age

Table 32 shows the likelihood of reducing car use by sex. It can be seen that women are more likely to use it less their cars than men for short trips. This largely reflects the different mixes of trip purposes: men are more likely to be making work and business trips while women are more likely to be making escort to education trips and the former trips had few alternatives while the latter had many. It should not be assumed that men are intrinsically less able or willing to reduce their car use than women.

The effects of age on willingness to reduce car use the car can be seen in Table 33. It can be seen that younger people are more likely to reduce using their cars than the elderly. This partly reflects a greater willingness and ability to cycle and use buses by the young. Also, the elderly had more cases where no alternative could be identified.

Table 31 Likelihood of reducing car use by trip purpose (%)

Likelihood	Work	Business	Shopping	Escort to education	Other escort	Personal business	Social	Change mode	Home and education	Total
High	0	0	1	0	0	4	0	0	1	1
Quite high	7	9	18	8	13	24	23	19	18	17
Moderate	26	9	18	69	44	21	23	18	30	30
Quite Low	23	30	40	14	20	28	28	43	29	28
Low	13	13	2	1	2	1	0	1	2	3
Very low	31	39	21	8	21	22	24	18	19	22
Total	100	100	100	100	100	100	100	100	100	100
Number	203	23	197	74	207	82	205	67	566	1624
Score	2.67	2.35	3.12	3.68	3.27	3.35	3.23	3.19	3.28	3.18
Score ratio	0.83	0.74	0.98	1.16	1.03	1.05	1.01	1.00	1.03	1.00

Table 32 Likelihood of reducing car use by sex (%)

Likelihood	**Male**	**Female**	**Total**
High	0	1	1
Quite high	19	14	17
Moderate	22	37	30
Quite Low	28	29	28
Low	2	4	3
Very low	28	15	22
Total	**100**	**100**	**100**
Number	**796**	**828**	**1624**
Score	3.02	3.33	3.18
Score ratio	0.95	1.05	1.00

Table 33 Likelihood of reducing car use by age group (%)

Likelihood	**17-29**	**30-59**	**60+**	**Total**
High	1	1	0	1
Quite high	21	13	25	17
Moderate	27	35	15	30
Quite Low	33	27	29	28
Low	3	4	1	3
Very low	15	20	20	22
Total	**100**	**100**	**100**	**100**
Number	**150**	**1107**	**362**	**1624**
Score	3.40	3.19	3.06	3.18
Score ratio	1.07	1.00	0.96	1.00

6.5 The likelihoods by car ownership level

When the number of cars in the household is considered, as shown in Table 34, no clear picture emerges. Those most able to find alternatives are those in households with two cars whilst those who would be least likely to change are those in households with three or more cars. This partly reflects the numbers who were able to identify alternatives. It also reflects the relatively high proportions of those from 3+ car households who were using their cars because they needed them at work or for a further trip or claimed that their cars were essential.

Table 34 Likelihood of reducing car use by number of cars owned (%)

Likelihood	**0 or 1 car**	**2 cars**	**3+ cars**	**Total**
High	1	0	0	1
Quite high	16	19	16	17
Moderate	30	31	18	30
Quite Low	26	34	36	28
Low	3	3	7	3
Very low	25	13	17	22
Total	**100**	**100**	**100**	**100**
Number	**1098**	**423**	**103**	**1624**
Score	3.10	3.40	2.90	3.18
Score ratio	0.97	1.07	0.91	1.00

Note: There was only one case of a driver from a household with 0 cars.

6.6 The likelihoods by time of day

As Table 35 shows, when the time of day is considered it is clear that there would be a low likelihood of reducing the number of car trips before 7.00 am because of the lack of alternatives and because the car is required at work. There is not much other variation across the rest of the day except that in the morning peak there is a higher than average value reflecting the large number of escort to education trips at this time.

Table 35 Likelihood of reducing car use by time of day (%)

Likelihood	**Before 0700**	**0700-0959**	**1000-1559**	**1600-1859**	**After 1859**	**Total**
High	0	2	0	1	0	1
Quite high	7	14	20	15	14	17
Moderate	24	35	23	31	39	30
Quite Low	21	26	33	30	16	28
Low	0	5	1	4	6	3
Very low	48	18	22	19	24	22
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**29**	**298**	**674**	**357**	**266**	**1624**
Score	2.41	3.25	3.18	3.19	3.17	3.18
Score ratio	0.76	1.02	1.00	1.00	1.00	1.00

6.7 The likelihoods by area

Table 36 shows the variation across the five areas. The differences largely reflect the numbers of trips for which there are alternatives. The area where there is most likely to be a shift is Ipswich and the least likely is Hereford. Both are free-standing towns, but Ipswich is much larger and it may be that a greater proportion of needs can be met there without using the car. There are more public transport alternatives in London than elsewhere and this is partly reflected in the high score there. In general, there is a greater chance of reducing car use in urban areas than rural areas, but the picture is fairly complex.

Table 36 Likelihood of reducing car use by area (%)

Likelihood	London	Leeds	Ipswich	Hereford	Dorset	Total
High	4	0	0	0	0	1
Quite high	7	13	23	16	21	17
Moderate	47	34	33	22	19	30
Quite Low	28	28	30	26	30	28
Low	2	7	2	1	2	3
Very low	12	16	13	35	27	22
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**147**	**491**	**333**	**372**	**281**	**1624**
Score	3.46	3.22	3.50	2.82	3.06	3.18
Score ratio	1.09	1.01	1.10	0.89	0.96	1.00

6.8 Conclusions on the likelihoods of switching from car driving

From this analysis, it seems that it is more likely that longer short trips will be switched than very short ones. It is feasible for most people to walk a journey of less than one mile. Hence when the car is used for these very short trips it is because the nature of the trip makes use of the car essential: the activity could not otherwise be carried out.

The easiest type of trips to switch to alternatives would be taking children to school: the most difficult would be work and business trips. Women are more likely than men to reduce use of the car, but this largely reflects the relative mixes of trip purposes. The young are more likely to reduce their use of the car than the elderly. As will be shown later this is because the young are more willing to cycle and use the bus than their elders. It would be most difficult to reduce the number of short trips early in the morning, partly because of the nature of the trips, but also because of the lack of alternatives. It would be easier to reduce the number of short car trips in urban areas than in rural areas also because of the greater range of alternatives available.

7 THE ALTERNATIVES TO DRIVING

7.1 Establishing the alternatives perceived

Having considered the reasons why car drivers use their cars, and established that there are different levels of necessity of use of the car and therefore the likelihood of switching from the car, it is now appropriate to consider the alternatives. Each respondent was asked to identify the alternatives which he or she considered to be available. Prompting was used to ensure all possibilities including non-travel alternatives such as home delivery and telecommuting were considered.

As discussed in Section 5.3, the respondents mentioned a total of 2929 alternatives for the 1624 car driver trips. In 400 cases these were mentioned negatively. Excluding these left a total of 2529 alternatives. As discussed in Section 5.3, these have been combined in order not to give extra weight to those car drivers who happened to mention several alternatives. It may be recalled that when the reasons for travelling by car were analysed they were ranked and priority given to the one assessed to be dominant. It is not appropriate to use the same technique here because the purpose of the analysis is to reveal the range of alternatives revealed by the respondents. As discussed above, they have been combined in the cases where more than one alternative was mentioned by allocating each of them a weighting which is the reciprocal of the number of alternatives. This also implies that each alternative identified by a respondent is regarded as equally likely. These three sets of alternatives (total, likely and weighted) are shown in Table 37.

The dominance of walk and bus as alternatives is clear. Cycle comes third, followed by taxi. For 173 trips no possible alternatives could be identified despite prompting by the interviewer. A further 178 alternatives were mentioned but only to be ruled out explicitly. This means that for a total of 351 trips no viable alternatives were mentioned. When the alternatives are weighted to ensure they sum to 1624 there are still 351 trips for which there is no alternative. This means that the car drivers could not identify any alternatives for 22% of the trips. For the other 78%, walk was identified in 31% of cases, bus also 31%, cycle 7% and taxi 3%. Two per cent of the trips could be transferred to train or tube and another 2% to public transport (not specified further). A few people mentioned motorcycle and tram, but the numbers were so small that they will not be considered further in this analysis. This means that over 75% of the car driver trips could be replaced by another mode. Four percent of trips would not be made: half of them because someone else would make the trip, for example a neighbour could collect a child from school, and half would be replaced in some other way.

Table 37 The alternatives considered by car drivers

Alternatives	Total alternatives mentioned		All likely alternatives mentioned		Likely alternatives weighted	
	Number	%	Number	%	Number	%
No alternative	173	6	351	14	351	22
Modal alternatives						
Walk	1071	37	808	32	500	31
Bus	956	33	806	33	496	31
Cycle	301	10	240	9	114	7
Taxi	174	6	98	4	48	3
Train or tube	53	2	52	2	26	2
Public transport (not specified)	48	2	41	2	26	2
Motorcycle	8	0	8	0	4	0
Tram	2	0	2	0	1	0
Other alternatives						
Somebody else make the trip	75	3	73	3	34	2
Would not make the trip	68	2	50	2	25	2
Total	**2929**	**100**	**2529**	**100**	**1624**	**100**

7.2 The alternatives by trip length

It is interesting to see whether there are differences in the alternatives identified for different trip lengths. It is clear from Table 38 that this is the case. The very short trips of less than one mile have slightly more than the average for which there was no alternative. This reflects the fact identified above that some people are making these very short trips by car because there is no other way to do so, for example because they are carrying heavy goods or escorting an elderly person for example. Not surprisingly, walk becomes a less likely alternative with increasing trip length and bus increasingly likely. Cycling also shows a slight tendency to be a more likely alternative with increasing trip length. The other figures are all too small for the variations to be regarded as significant.

Table 38 Weighted likely alternatives perceived by car drivers by trip length (%)

Alternatives	**<1 mile**	**1 to < 2 miles**	**2 to < 5 miles**	**Total**
No alternative	23	21	21	22
Walk	44	37	23	31
Bus	17	27	37	31
Cycle	6	7	8	7
Taxi	3	2	3	3
Train or tube	1	1	2	2
Public transport (not specified)	1	2	2	2
Somebody else make the trip	3	2	2	2
Would not make the trip	2	2	1	2
Total	**100**	**100**	**100**	**100**
Number	**286**	**497**	**841**	**1624**

7.3 The alternatives by trip types

Next it is interesting to examine whether there are variations in the alternatives identified for different types of trip. Table 39 shows the alternatives identified for each trip purpose. It can immediately be seen that there is variation in the proportion of trips for which there is no alternative to using the car. Business and work trips are the ones for which there are fewest alternatives while escort to education is the one for which there are most alternatives partly reflecting the fact that many of these trips are short and the fact that children must be able to get to school. Walk and bus are the dominant alternatives for all trip purposes. There is some variation between the purposes in their relative market shares with walk attracting more business, escort to education, other escort and social trips while bus dominates for the others. Cycling is highest for work trips and lowest for escort to education, the former reflecting the need to make the journey regularly and the latter the need to take children who may not be able to cycle. Of the trip purposes, taxi is most important for shopping and social trips: the former because of the need to carry heavy goods, the latter because such trips are often made in the evening when the bus service is not so good and because they may involve several people travelling together. Of the various purposes, the one which could be suppressed most easily is business because 8% could be replaced by not making the trip, presumably using other forms of communication in some cases. Both escort to education and personal business trips could have quite large numbers transferring to not travelling, split fairly evenly between someone else travelling and not making the trip at all. The trip purpose for which not travelling is least viable is work, reflecting the compulsory nature of work.

Table 39 Weighted likely alternatives identified by car drivers by trip purpose (%)

Alternatives	Work	Business	Shopping	Escort to education	Other escort	Personal business	Social	Change mode	Home and education	Total
No alternative	30	39	21	8	21	22	24	18	19	22
Walk	26	27	31	41	35	27	31	24	31	31
Bus	32	21	31	37	26	30	28	42	32	31
Cycle	9	5	6	4	6	8	7	8	7	7
Taxi	1	0	4	1	3	3	4	2	3	3
Train or tube	1	0	1	3	1	2	1	3	2	2
Public transport (not specified)	1	2	2	0	3	2	1	2	1	2
Somebody else make the trip	0	0	2	4	3	4	2	2	2	2
Would not make the trip	1	8	2	3	2	3	0	0	2	2
Total	100	100	100	100	100	100	100	100	100	100
Number	203	23	197	74	207	82	205	67	566	1624

This analysis can be taken further by considering the distribution of the alternatives against the reasons for using the car, as shown in Table 40. Here there is a very wide variation in the numbers saying that there was no alternative ranging from 65% of those who had said that the car was essential and 56% of those taking the elderly and ill to 0% of those who used the car to take their dogs out. There was no alternative for more than the average proportion of trips for the following reasons for using the car: carrying heavy goods, convenience, making a further trip, needing the car for work, social, taking the elderly or ill, not being able to manage without the car and feeling unwell. There is a large difference between those whose main reason for using the car was to take members of their families and friends for which only 9% of trips were perceived to have no alternative and taking the old or ill with 56% of trips with no alternative. (This is a wider difference than that identified for escort to education and other escort trips in Table 39 largely because the other escort category includes trips such as taking other people on shopping trips which would appear under other categories here).

Overall the potential shift to walk and bus would be similar. Those using the car because of the distance, because they wish to make a further trip, for social reasons and because they felt unwell, show a strong preference for bus rather than walk, while those giving a lift to family and friends would shift slightly more to bus than walk. Conversely, those who use the car because they are short of time, because they need it at work, because of bad weather or darkness, or because they are taking the elderly or ill prefer the alternative of walking to using the bus. In some cases, such as darkness, bad weather and shortage of time, this seems rather surprising and suggests that the bus does not meet their needs very well.

It is interesting to consider these figures the other way round. That is, for each alternative identified, to see why the car was being used. This is shown in Table 41. It is important to remember to compare the figures in each cell with the overall total in the final column. Walking appeals most to those using their cars to give lifts to family and friends, those using the car because they are short of time (presumably organising themselves to have enough time), because of bad weather, because it is dark and those who need the car for work, where they presumably would make other arrangements. Bus appeals to those giving a lift to members of their families or friends or using their cars because it is a long way. Switching to cycling appeals most to those using their cars because they are short of time, and because of bad weather. Taxis appeal most to those who are using their cars because it is a long way or because it is dark, those using cars for social reasons and those taking the elderly and ill. Train and tube are seen as most attractive by those who are short of time, those who value the car for its convenience and those feeling unwell or do not like travelling after dark. Someone else would make the trip for those who have heavy goods to carry and those giving a lift to someone else to a greater extent than would be expected. The trips that would simply not be made if a car were not available would be giving lifts to family and friends, where presumably the person given the lift would have to make his or her own way there or not go, trips were the car was a matter of convenience, and social trips. Thus, it can be seen that the potential transfer to the various alternatives can be related to the reasons why the car was being used. This is potentially very useful for targeting the various alternatives to different types of car user.

Table 40 Weighted likely alternatives identified by car drivers by reason for using the car (%)

Alternatives	Heavy goods	Lift for family	Short of time	Long way	Conven -ience	Further trip	Needed for work	Bad weather	Dark out	Social	Taking old or ill	Car essential	Felt unwell	Walking the dog	Total
No alternative	24	9	9	16	27	38	48	8	7	25	56	65	25	0	22
Walk	29	36	40	19	30	30	33	42	43	16	12	19	0	67	31
Bus	31	39	27	44	31	44	15	25	33	37	2	14	38	0	31
Cycle	6	6	15	9	3	7	2	18	5	5	0	0	0	0	7
Taxi	2	1	2	5	2	2	0	1	7	8	12	2	13	0	3
Train or tube	2	1	4	2	3	0	0	0	2	1	0	0	25	0	2
Public transport (not specified)	2	2	0	1	0	3	0	0	0	1	9	0	0	33	2
Somebody else make the trip	3	3	2	2	1	0	0	1	1	5	6	0	6	0	2
Would not make the trip	1	3	1	1	3	1	2	0	1	3	1	0	0	0	2
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number	304	268	184	180	163	147	89	75	73	67	43	20	8	3	1624

Table 41 Main reasons for driving the car by weighted main alternatives (%)

Reason for using car	No alternative	Walk	Bus	Cycle	Taxi	Train or tube	Public transport	Somebody else	Would not travel	Total
Heavy goods	21	17	19	15	14	19	28	26	17	19
Lift to family	7	20	21	15	8	9	23	23	28	17
Short of time	5	15	10	24	8	27	3	13	7	11
Long way	8	7	16	14	21	12	8	12	8	11
Convenience	13	10	10	5	7	17	2	5	8	10
Further trip	16	9	6	9	5	0	16	0	4	9
Needed for work	12	6	3	1	0	0	0	0	6	5
Bad weather	2	6	4	12	2	0	0	1	0	5
Dark out	1	6	5	3	11	6	0	3	4	4
Social	5	2	5	3	11	2	3	9	8	4
Taking old or ill	7	1	0	0	10	0	16	7	2	3
Car essential	4	1	1	0	1	0	0	0	0	1
Felt unwell	1	0	1	0	2	8	0	0	0	0
Walking the dog	0	0	0	0	0	0	4	0	0	0
Total	100	100	100	100	100	100	100	100	100	100
Number	351	500	496	114	48	26	26	34	25	1624

7.4 The alternatives by age and sex

It is possible to take this concept of targeting reductions in car use further by identifying which types of people are most likely to consider the various alternatives. Table 42 shows the alternatives identified by males and females. It can be seen that males are much more likely to claim that there is no alternative to the car. This partly reflects the nature of their trips, for example making more work and business trips for which fewer alternatives were identified than other trip purposes. Men are more likely to see cycling as an alternative than women. Of those switching to an alternative, men are more likely to choose walking than bus whereas women are more likely to choose the bus. Of those not making the trip at all, women are more likely to let someone else make the trip while men are more likely not to travel at all, again partly reflecting the nature of their trips.

Table 42 Weighted likely alternatives identified by drivers by sex (%)

Alternatives	**Male**	**Female**	**Total**
No alternative	28	15	22
Walk	28	33	31
Bus	25	36	31
Cycle	8	6	7
Taxi	3	3	3
Train or tube	1	2	2
Public transport (not specified)	2	1	2
Somebody else make the trip	2	3	2
Would not make the trip	2	1	2
Total	**100**	**100**	**100**
Number	**796**	**828**	**1624**

A similar analysis can be carried out by age group as shown in Table 43. Here it can be seen that willingness to consider alternatives decreases with age. Similarly, willingness to consider cycling decreases rapidly with age. This, together with the previous information, suggests that promotion of cycling as an alternative to the car should be targeted at young males. Preference to walk relative to bus increases with age, but this may just reflect the nature of the trips being made. The propensity to let someone else make the trip also increases with age. Overall the greatest willingness to consider the green modes of walking and cycling is shown by those of middle years with 40%, followed by the young with 38%, and then the elderly at 31%.

Table 43 Weighted likely alternatives identified by car drivers by age (%)

Alternatives	**17-29**	**30-59**	**60+**	**Total**
No alternative	15	20	30	22
Walk	25	32	29	31
Bus	40	31	26	31
Cycle	13	8	2	7
Taxi	4	2	5	3
Train or tube	0	2	1	2
Public transport (not specified)	2	1	3	2
Somebody else make the trip	0	2	3	2
Would not make the trip	1	2	1	2
Total	**100**	**100**	**100**	**100**
Number	**150**	**1107**	**362**	**1624**

Note: There are 5 cases where the age is not known.

7.5 The alternatives by car ownership level

It was suggested previously that those in single car households might be less able to find alternatives to the car than others because more of their car trips have a relatively good reason for car use. This is borne out by Table 44 which shows that those with only one cars are less likely than average to be able to find an alternative. This may also explain why those in single car-owning households see greater potential use of taxis despite the fact that their incomes are probably lower. Interestingly potential cycle use increases with increasing car ownership: this may reflect the existence of young people with their own cars in the 3+ car households. However, people from these households are also more likely to choose the bus relative to walking. This may reflect the fact that some of these households with several cars may live in fairly isolated areas which is partly why they have so many cars.

Table 44 Weighted likely alternatives identified by car drivers by number of cars owned (%)

Alternatives	**0 or 1 car**	**2 cars**	**3+ cars**	**Total**
No alternative	25	13	17	22
Walk	31	33	25	31
Bus	27	39	34	31
Cycle	6	8	15	7
Taxi	3	2	1	3
Train or tube	2	2	0	2
Public transport (not specified)	2	2	0	2
Somebody else make the trip	3	1	1	2
Would not make the trip	2	1	4	2
Total	**100**	**100**	**100**	**100**
Number	**1098**	**423**	**103**	**1624**

Note: There was only one case of a driver from a household with 0 cars.

7.6 The alternatives by time of day

A further explanation for variations in willingness to see alternatives may be reflected in the time of travel, as shown in Table 45. It can immediately be seen that those travelling in the early morning are less likely to have any alternative than others. Of those who do see an alternative they are much more likely to walk or cycle than use the bus, relative to others. The same is true, but to a much lesser extent in the evening. There is not much variation across the three daytime periods. Those travelling in the peaks are slightly more prepared to identify alternatives, to use buses, bicycles, trains and the tube than those travelling in the interpeak period. This partly reflects the large number of work trips being made during the peak.

Table 45 Weighted likely alternatives identified by car drivers by time of day (%)

Alternatives	Before 0700	0700-0959	1000-1559	1600-1859	After 1859	Total
No alternative	48	19	22	19	24	22
Walk	29	31	31	31	32	31
Bus	10	35	30	32	29	31
Cycle	10	7	6	8	8	7
Taxi	1	1	3	4	3	3
Train or tube	2	2	1	2	2	2
Public transport (not specified)	0	2	2	1	2	2
Somebody else make the trip	0	2	3	2	1	2
Would not make the trip	0	2	2	2	0	2
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**29**	**298**	**674**	**357**	**266**	**1624**

7.7 The alternatives by area

There may also be variation across the five areas in the perceived alternatives, as shown in Table 46. It can be seen that there is a tendency for fewer alternatives to be identified with increasing rurality, which is what would be expected. It is not a simple linear relationship because Hereford is the area where fewest alternatives are perceived and Leeds has fewer than Ipswich.

One clear factor than comes out is the variation in potential cycling across the areas. Ipswich is the flattest of the areas and has the highest figure for cycling while Leeds which is the hilliest has the lowest figure. The figure for London seems surprisingly high given the amount of road traffic and pollution, but reflects the fact that London is fairly flat and many opportunities are fairly close to one another. London is the only area where rail is seen as a significant alternative by many people. London is also the area in which the alternative of letting someone else make the trip is highest, perhaps reflecting the fact that people live at high densities and so it is likely that a neighbour could make the trip, for example taking your child to school with his or her own. If this is the reason it is not obvious why it does not apply in Leeds. Not making the trip at all is most popular in Dorset which is not surprising. If it is not possible to use the car then it is not possible to make certain trips in rural areas because it is too far to walk and public transport does not serve some areas.

Table 46 Weighted likely alternatives identified by car drivers by area (%)

Alternatives	London	Leeds	Ipswich	Hereford	Dorset	Total
No alternative	12	17	13	35	27	22
Walk	26	41	34	23	22	31
Bus	31	34	32	24	32	31
Cycle	8	1	13	10	5	7
Taxi	1	3	2	3	5	3
Train or tube	13	0	0	1	1	2
Public transport (not specified)	2	2	1	1	2	2
Somebody else make the trip	5	2	2	1	2	2
Would not make the trip	1	1	2	0	4	2
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**147**	**491**	**333**	**372**	**281**	**1624**

7.8 Conclusions on the alternatives perceived by car drivers

In this section, it has been shown that there are one or more alternatives for 78% of the trips examined in the survey, implying that there are about 22% of trips for which no alternative could be identified despite extensive prompting by the interviewers. The main reasons for not being able to identify an alternative are because the car is regarded as essential, because the car is needed to take the elderly or ill somewhere, or because it is needed at work. The trips for which it would be easiest to find an alternative were those where the car was used for taking the dog for a walk, because it is bad weather or dark out, and because of a shortage of time.

About 31% of the trips could be transferred to walk and another 31% to bus. About 7% could be switched to cycle. About 4% of trips would not be made by the car driver being interviewed, with about half of these being undertaken by someone else.

More alternatives were identified for the longer short trips. This is because in many cases those using the car for very short trips (less than one mile) really needed to use it, for example because of heavy shopping or because of disability. As discussed previously, escort to education is the trip purpose for which it would be easiest to find an alternative, and work and business trips the most difficult. The trip purpose for which walking would be the most popular is taking children to school, while it would be least popular for changing mode. Walking would be popular relative to the bus for trips being made by car because of a shortage of time, bad weather and darkness and taking the elderly and ill. The trip purpose for which bus would be the most popular alternative is changing mode, whilst it would be least popular for business trips. Relative to walking, bus would be popular for trips where the car was

used because it is a long way and because of illness. Similarly, cycle would be most popular as an alternative for work trips and least for escorting to education. Taxis are an attractive alternative to those making shopping and social trips. The trips which could be most easily dispensed with are business trips, while the ones that could most easily be done by someone else are taking children to school and personal business.

Men are less likely than women to be able to transfer from the car because of the types of trips which they make. Those who do transfer are more likely to prefer to walk than use the bus. They are more likely to cycle than women are. Women are more likely to transfer to the bus.

The probability of being able or willing to transfer to an alternative decreases with age. The young are more likely to cycle and travel by bus than the old, while those in middle age are more likely to transfer to walking.

Very few trips in the early morning could be transferred from car because of the lack of alternatives and the nature of the trips being made then.

Those living in urban areas are more likely to be able to find alternatives. Cycling would be most popular as an alternative in the towns of Ipswich and Hereford, and quite popular in London, whilst walking would be most popular in Leeds. Bus would be slightly less popular as an alternative in Hereford than elsewhere. It is only in London where rail is at all significant. In Dorset there would be the greatest suppression of trips if the car was not available, whilst those in London would be most able to get someone else to make the trip.

8 THE BEHAVIOUR OF CAR PASSENGERS

8.1 Why some people are car passengers

Having considered the reasons why some people drive cars and the alternatives which they see, attention can now be turned to car passengers. Because in many cases they will have less control over the use of the car and because there are fewer of their trips in the survey (263 compared with 1624), they will not be examined in such detail.

The data have been analysed in the same way as those for car drivers, for example to establish the main reasons for being a car passenger. Table 47 shows both the total numbers giving each reason, and the numbers for whom it is a main reason.

Table 47 Main reasons for being a car passenger

	Total reasons		Main reasons	
Reason	**Number**	**Percentage**	**Number**	**Percentage**
Long way	83	22	59	22
Heavy goods	78	21	58	22
Convenience	60	16	54	21
Lift for family	22	6	22	8
Short of time	23	6	17	6
Bad weather	30	8	15	6
Dark out	29	8	10	4
Felt unwell	9	2	9	3
Social trip	24	6	7	3
Needed for work	4	1	4	2
Further trip	2	1	2	1
Taking old or ill	6	2	2	1
Unpleasant route	4	1	2	1
No reason	2	1	2	1
Car essential	3	1	0	0
Total	**379**	**100**	**263**	**100**

The reasons are ranked in order of the main reason. Three main reasons stand out: distance, carrying heavy goods and convenience. All have higher percentages than the highest one for driving which was carrying heavy goods with 19%. Giving a lift to family member or friend is less important than it is for drivers, but it is still quite important at 8%. In many cases the respondent in the interview would be the person being given the lift. Similarly, time constraints were quite important, but not as important as they are for drivers, which may well reflect the types of trip they are making.

Table 48 shows the reasons the passengers were travelling by car for the various trip purposes. It should be noted that some cells reflect fairly small numbers. Those travelling to work as passengers did so mainly because of the distance. Many also did so because it was dark. These reasons contrast with those for drivers going to work who tended to use the car because they needed it at work. Those going shopping as passengers tend to do so because of the need to carry heavy goods as is the case for car drivers. The two types of escort trip have been added together because there was only one escort to education trip. The reason for using the car was usually given as convenience or because a lift was being given. For social trips, the main reason for going by car was simply because it was a long way, possibly reflecting the fact that such trips may be in the evening and the alternatives might not be very attractive. Those being taken by car in order to take another mode tend to do so because they are short of time or because the weather is bad.

8.2 The alternatives to being a car passenger

The alternatives perceived by car passengers have been processed in the same way as those for car drivers. As shown in Table 49, 450 alternatives (including `no alternative') were identified for the 263 trips. Of these, 67 were mentioned negatively and so regarded as unlikely to be adopted, leaving 383. These have been weighted in the same way as for car drivers so that they sum to 263, the number of car passenger trips. The values are similar to those selected by car drivers. In fact, more passengers (24% compared with 22%) say that there is no alternative to using the car. The preferred alternative is bus (34%), with walk close behind with 30%. (These were both 31% for car drivers). Cycling at 5% was slightly less popular as an alternative than it was for drivers (7%), but taxi at 5% was more popular than it was for drivers, probably reflecting the fact that some car passengers are being taken by car because the trip cannot be made by the other alternatives because of the distance involved and the lack of a bicycle or public transport.

Because of the small numbers citing unspecified public transport or train or tube they will be included with bus, which will be indicated as `bus+' in the tables as a reminder it actually includes more than bus. The person walking to somewhere else is interesting, but will be included with the other walkers as there is only one example. The two non-travel alternatives will be treated as a single category labelled `Not travel' because of the small numbers.

Table 48 Main reasons for being a car passenger by trip purpose (%)

Reason for using car	Work	Business	Shopping	Escort	Personal business	Social	Change mode	Home and education	Total
Long way	44	17	23	0	14	27	10	20	22
Heavy goods	11	0	49	11	14	11	20	22	22
Convenience	22	33	14	33	43	19	25	19	21
Lift to family	0	0	5	44	0	6	10	10	8
Short of time	0	0	2	11	0	8	15	7	6
Bad weather	6	0	5	0	0	8	10	5	6
Dark out	11	0	0	0	0	8	0	3	4
Felt unwell	0	0	2	0	14	6	0	3	3
Social	0	0	0	0	0	2	10	4	3
Needed for work	0	50	0	0	0	0	0	1	2
Further trip	0	0	0	0	0	0	0	2	1
Taking old or ill	0	0	6	0	0	2	0	1	1
Unpleasant route	0	0	0	0	14	0	0	1	1
No reason	6	0	0	0	0	2	0	0	1
Total	100	100	100	100	100	100	100	100	100
Number	18	6	43	9	7	62	20	98	26

Table 49 The alternatives considered by car passengers

Alternatives	Total alternatives mentioned		All likely alternatives mentioned		Likely alternatives weighted	
	Number	%	Number	%	Number	%
No alternative	15	3	62	16	62	24
Modal alternatives						
Bus	155	34	130	34	88	34
Walk	173	38	122	32	80	30
Taxi	63	14	31	8	14	5
Cycle	20	4	16	4	7	3
Public transport (not specified)	5	1	3	1	2	1
Train or tube	4	1	4	1	2	1
Walk to somewhere else	3	1	3	1	1	1
Other alternatives						
Would not make the trip	10	2	10	3	5	2
Somebody else make the trip	2	0	2	1	1	0
Total	**450**	**100**	**383**	**100**	**263**	**100**

8.3 The alternatives to being a car passenger by type of trip

The purposes for which car passenger would choose the various alternatives are shown in Table 50. Escort trips are the second highest to business trips in terms of not being able to identify an alternative (but both are based on small numbers of trips). Interestingly, 33% of car passengers being escorted saw no alternative while only 8% of drivers on education escort and 21% of the drivers on other escort saw there being no alternative, suggesting different perceptions of the necessity of taking the passenger by car. (It should be noted that these figures do not refer to the same trips). Bus is most popular with those travelling to work and shoppers. Those most likely to walk are those on business and personal business trips. Taxis would tend to be used by those who say the main purpose of the trip is to escort them and those on social trips. This reflects the nature of the trips and those who make them. Cycling is most popular with those travelling to work. Not making the trip is seen as an option most by those travelling on personal business.

Table 50 Weighted likely alternatives to being a car passenger by trip purpose (%)

Alternatives	**Work**	**Business**	**Shopping**	**Escort**	**Personal business**	**Social**	**Change mode**	**Home and education**	**Total**
No alternative	11	50	23	33	14	26	20	23	24
Bus+	55	8	41	28	29	29	33	36	35
Walk	19	42	31	28	43	31	38	31	31
Taxi	8	0	1	11	7	10	2	4	5
Cycle	7	0	2	0	0	3	3	3	3
Not travel	0	0	2	0	7	1	4	3	2
Total	100	100	100	100	100	100	100	100	100
Number	18	6	43	9	7	62	20	98	263

Table 51 shows the likely alternatives that would be selected by those who were travelling by car for various reasons. Those who felt least able to find an alternative were those who were simply being given a lift (presumably because there was no alternative) those who felt unwell, those who needed the car for work, those making a further trip and those taking the elderly and ill. Everyone travelling by car for the following reasons could identify at least one alternative: because it was dark out, because it was a social trip, and because it was an unpleasant area to walk through. Those travelling as car passengers because of the distance involved, because they had heavy goods to carry or were short of time would tend to switch to bus while those going by car out of convenience or simply because they were being given a lift would be more inclined to switch to walking.

Table 52 shows the same data tabulated in the alternative direction. This reinforces the points made above. It also shows that those most likely to switch to taxi are those travelling by car because it is a long way, those whose travel provided the whole rationale of the trip, and those being taken by car because of bad weather or because they felt unwell. Cycling would appeal most to those using the car because of the distance involved or because it was dark, while not making the trip at all would appeal most to those who had heavy goods to carry: presumably they would obtain the goods by some other means.

8.4 The alternatives to being a car passenger by sex and age

It is interesting that, in general, there are bigger differences between the sexes, as shown in Table 53, than occurred for car drivers (Table 42). Over a quarter of the women being taken by car said that there was no alternative while only 6% of men said this. Men were also more willing to walk and cycle.

Table 54 shows the differences by age group. As with car drivers, the group who are least able to identify alternatives is the elderly. It is much higher at 45% than the 30% for elderly drivers. It is likely that the elderly who drive are more agile than the equivalent people who cannot. Another major difference compared with car drivers is the high proportion of young passengers (29%) compared with car drivers (15%). Many of the passengers may have been being taken by car simply because there was no alternative. Bus is an alternative for many car passengers in all age groups, particularly the middle aged and elderly. Walking is not seen as an alternative for many in the oldest group (10%), which is low compared with the 29% for the car drivers in this age group. Taxi appeals most to those in the middle age group, which is the opposite of the position for drivers. Cycling does not really appeal to any of the age groups: only 2% of young car passengers mentioned it compared with 13% of drivers of the same age.

8.5 The alternatives to being a car passenger by trip length

The factors influencing the choices cause differences in the impacts on trips of varying lengths, as shown in Table 55. The trips for which there are fewest alternatives are the longer short trips (2 to 5 miles), in contrast to car driver trips, for whom it was more likely to be the shortest trips. This reflects the fact that some car passengers are being taken by car because there is no other way they could get to their destinations. The pattern of switching to bus and walking is as would be expected: the longer trips to bus, the shorter ones to walking. There is not an obvious pattern associated with the trip lengths for the other alternatives.

Table 51 Weighted likely alternatives by reason for being a car passenger (%)

Alternatives	Long way	Heavy goods	Conven -ience	Lift for family	Short of time	Bad weather	Dark out	Felt unwell	Social	Needed for work	Further trip	Taking old or ill	Unple- asant route	No reason	Total
No alternative	29	26	17	41	6	7	0	44	0	50	100	100	0	0	24
Bus+	40	41	32	14	48	11	40	39	43	25	0	0	50	100	35
Walk	18	22	45	36	42	64	40	0	38	25	0	0	50	0	31
Taxi	6	3	4	9	0	12	8	17	10	0	0	0	0	0	5
Cycle	6	1	2	0	4	2	12	0	0	0	0	0	0	0	2
Not travel	1	7	0	0	0	3	0	0	10	0	0	0	0	0	2
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number	59	58	54	22	17	15	10	9	7	4	2	2	2	2	263

Table 52 Main reasons for being a car passenger by weighted main alternatives (%)

Reason for using car	No alternative	Bus+	Walk	Taxi	Cycle	Would not travel	Total
Long way	27	25	13	24	49	12	22
Heavy goods	24	26	16	14	7	68	22
Convenience	15	19	30	14	14	0	21
Lift for family	15	3	10	14	0	0	8
Short of time	2	9	9	0	9	0	6
Bad weather	2	2	12	13	5	9	6
Dark out	0	4	5	6	16	0	4
Felt unwell	6	4	0	10	0	0	3
Social	0	3	3	5	0	12	3
Needed for work	3	1	1	0	0	0	2
Further trip	3	0	0	0	0	0	1
Taking old or ill	3	0	0	0	0	0	1
Unpleasant route	0	1	1	0	0	0	1
No reason	0	2	0	0	0	0	1
Total	100	100	100	100	100	100	100
Number	62	92	82	14	7	6	263

Table 53 Weighted likely alternatives to being a car passenger by sex (%)

Alternatives	**Male**	**Female**	**Total**
No alternative	6	27	24
Bus+	37	35	35
Walk	42	28	31
Taxi	6	5	5
Cycle	6	2	3
Not travel	3	2	2
Total	**100**	**100**	**100**
Number	**48**	**215**	**263**

Table 54 Weighted likely alternatives for car passengers by trip length (%)

Alternatives	**0-29**	**30-59**	**60+**	**Total**
No alternative	29	14	45	24
Bus+	28	43	40	35
Walk	38	35	10	31
Taxi	3	7	3	5
Cycle	2	4	0	3
Not travel	0	3	2	2
Total	**100**	**100**	**100**	**100**
Number	**62**	**150**	**51**	**263**

Table 55 Weighted likely alternatives for car passengers by trip length (%)

Alternatives	**<1 mile**	**1 to < 2 miles**	**2 to < 5 miles**	**Total**
No alternative	21	19	28	24
Bus+	18	29	44	35
Walk	53	45	15	31
Taxi	6	2	8	5
Cycle	0	4	2	3
Not travel	3	1	3	2
Total	**100**	**100**	**100**	**100**
Number	**39**	**91**	**133**	**263**

8.6 Conclusions about the behaviour of car passengers

The responses of car passengers are fairly similar to those for car drivers. The main reasons for being are a car passenger are the length of the trip, the need to carry heavy goods and convenience. Those travelling to work as car passengers generally do so because of the distance involved, implying a lack of suitable alternatives.

24% of car passengers were unable to identify any alternatives, which is slightly higher than the equivalent for car drivers. Of those who could switch, bus is the most popular, particularly for those going to work and the shops. This is followed by walking which appealed most to those on business and personal trips. Cycling was less popular than for drivers. Taxi appealed more to passengers than drivers as an alternative, particularly with those on social trips and those for whom a car trip was being especially made. Those in this last category were amongst the ones least able to identify possible alternatives, along with those being taken because they felt unwell, those travelling with the elderly or ill, or those who needed to make a further trip.

Male car passengers were more likely to be identify alternatives than females, and were more willing to walk and cycle. Elderly car passengers were much less able to identify possible alternatives than the equivalent drivers. This was also true of the younger passengers. Many of the young were prepared to consider walking, but very few identified cycling as an alternative. Bus is a popular alternative with all age groups.

In contrast to car drivers, it is the longest short trip for which there seem to be fewest alternatives, partly reflecting the fact that the only way some passengers could reach their desired destinations was to be taken by car.

9 WHAT WOULD MAKE PEOPLE REDUCE CAR USE FOR SHORT TRIPS?

9.1 Classification of the events that could make people reduce car use for short trips

Having considered the alternatives that car users perceive as available to them, the next stage is to consider what action or event might make them switch from driving their cars to the alternatives. Drivers will be considered first and in more detail because their actions largely dictate the number of cars on the road (and car trips being made especially for the benefit of passengers are included as escort trips).

Table 56 shows a list of 29 events that would have to happen to make drivers switch. These were identified in the coding exercise. As discussed previously, for 351 trips no alternative was identified. There were also a number of cases where, despite prompting by the interviewer, no specific event was identified. This is taken to mean that no outside action is required. For example somebody making a short journey by car simply because they could not be bothered to walk would fall in this category. The second and third columns show the events associated with the 2529 alternatives that were regarded as realistic. The last two columns show the values corresponding to the alternatives weighted to ensure that the results are not biased towards those identifying several alternatives. It can be seen from the last two columns that 21% of the alternatives required no specific event to make the driver choose the alternative. This means that no specific policy intervention by the government is likely to influence these trips. However, this does not mean that publicity about the benefits of the alternatives would not be useful. Of the 57% of trips for which there are events identified, the single largest one is improvement to bus routes, identified in 11% of cases. This is followed by the weather having to improve mentioned in 7% of cases. At 6% come `Bus frequency improved' and `Personal organisation improved'.
Examination of the events listed in Table 56 shows that there are a number of themes and some overlap between the events. A number relate to various aspects of improvement to public transport. Several relate to changes in individual behaviour. It is also clear that the number of car trips is pretty small in most cases. Hence there is a need to group the events. A scheme for this is shown in Table 57. This shows the 30 events (including `no alternative') grouped into 12 `actions'. `No alternative' and `No specific action' are kept separate. Of the other events, `Weather improved' and `Cost of travel reduced' do not fit into any convenient groupings, and so have been left on their own. The other events have been grouped into 8 actions: `Improve bus services', `Take personal action', `Make taking dependents easier', `Reduce the need to travel', `Improve walking facilities', `Improve cycle facilities', `Improve rail facilities' and `Cancel activity'. These have been classified as either collective or non-collective actions. The former are the actions that may be undertaken by the government or other organisations such as public transport operators which affect groups in society. The non-collective actions either require individual action, or, in the case of `improve the weather', nothing can be done.

In grouping the events, the most popular alternative identified for each action has been used to classify them where there was any ambiguity. For example, the three actions that mention `public transport' have been included under `Improvements to bus services' because many more of the trips where this type of action was mentioned were associated with a transfer to bus than to train.

Table 56 The events that have to happen to make car drivers switch from their cars

	Total events		Weighted events	
	No	%	No	%
No alternative	351	14	351	22
No specific action	560	22	336	21
Bus routes improved	267	11	170	11
Weather improved	195	8	113	7
Bus frequency improved	173	7	103	6
Personal organisation improved	151	6	89	6
Local travel has to be made safer for children	109	4	67	4
No lift offered	82	3	46	3
Cost of travel reduced	79	3	39	2
Facilities for cyclists improved	62	2	26	2
Bus information improved	58	2	31	2
Local travel made safer	58	2	29	2
Perception of public transport improved	57	2	33	2
Travel during daylight hours	56	2	41	3
Delivery service provided	55	2	28	2
Local shops improved	35	1	22	1
Local facilities improved	35	1	20	1
Public transport operated all night	24	1	18	1
Train frequency and service improved	16	1	10	1
Buy a bicycle	15	1	7	0
Street lighting improved	14	1	6	0
Cancel visit to relative or friend	13	1	10	1
Local train service introduced	12	0	5	0
Transport improved for the old and disabled	11	0	9	1
Public transport links improved	11	0	5	0
Facilities provided at work	9	0	3	0
Telecommuting becomes available	7	0	2	0
Cycle at lunchtime	6	0	2	0
Cancel business meeting	4	0	3	0
Cancel social activity	4	0	2	0
Total	**2529**	**100**	**1624**	**100**

Table 57 Allocation of the 30 events to categories of action

Event	Action	Collective?
No alternative	No alternative	-
No specific action	No specific action	No
Bus routes improved	Improve bus services	Yes
Bus frequency improved		
Bus information improved		
Perception of public transport improved		
Public transport operated all night		
Public transport links improved		
Train frequency and service improved	Improve rail	Yes
Local train service introduced		
Personal organisation improved	Take personal action	No
No lift offered		
Travel during daylight hour		
Buy a bicycle		
Cycle at lunchtime		
Weather improved	Improve the weather	No
Local travel made safer for children	Improve dependents' travel	Yes
Transport improved for the old and disabled		
Delivery service provided	Reduce the need to travel	Yes
Local shops improved		
Local facilities improved		
Telecommuting becomes available		
Local travel made safer	Improve walking facilities	Yes
Street lighting has to be improved		
Facilities for cyclists improved	Improve cycling facilities	Yes
Facilities provided at work		
Cost of travel reduced	Reduce the cost of travel	Yes
Cancel visit to relative or friend	Cancel activity	No
Cancel business meeting		
Cancel social activity		

Table 58 shows the number of car driver trips which each of these actions potentially would reduce. The table also shows who would be responsible for taking the action. As before, there are 22% of car driver trips for which there is no alternative. There are 21% for which no specific action is required: in many cases this just requires the person involved to make the effort of using an alternative. The largest category at 22% is `Improve bus services', which would require action from public transport operators. Since most of them are in the private sector their main motivation is to make a profit. Hence it would probably be necessary to have some form of subsidy to enable this to happen. This would require action by the government: this might mean legislation by central government with implementation by local government.

Table 58 Responsibility for implementing the actions to reduce car driving

Action	**No**	**%**	**Responsibility**
No alternative	351	22	-
No specific action	336	21	Individuals
Improve bus services	360	22	Public transport operators Central government Local government
Take personal action	185	11	Individuals
Improve the weather	113	7	Nobody
Improve dependents' travel	76	5	Public transport operators Central government Local government
Reduce the need to travel	72	4	Local government Retailers
Reduce the cost of travel	39	2	Public transport operators Central government Local government
Improve walking facilities	35	2	Local government
Improve cycling facilities	29	2	Local government Employers
Improve rail services	15	1	Public transport operators Central government Local government
Cancel activity	15	1	Individuals
Total	**1624**	**100**	

The fourth category is `Take personal action' with 11%. This would require the individuals concerned to organize their patterns of activities differently or to buy a bicycle. Here the onus is on the individual to take action, but there may be a role for education. The fifth category at 7% is `Improve the weather'. Nothing can be done about this, except that it might be possible to ameliorate the extreme aspects in some cases such as building more bus shelters. The next category is `Improve travel for dependents' which applies to 5% of trips. Generally this means making it easier and safer to use public transport by children and the elderly. This is something which public transport operators and government can address. There are already many initiatives such as low-floor buses, but it may be necessary to make the general public more aware of them.

The seventh category is `Reduce the need to travel', with 4%. This involves providing delivery services for shopping, providing better local shops and facilities and introducing telecommuting. Many of the supermarket chains are introducing home delivery services. The same supermarket chains have been one of the causes of the loss of local shops, so it is interesting to note that they now regard it as necessary to meet local needs by delivery. Reducing the need to travel requires further action by retailers. It probably needs action by the government to prevent further decentralisation of retail activity and for local authorities to encourage the development of local facilities such as leisure centres. This would mean the reversal of a trend of recent years whereby facilities have tended to be concentrated in a smaller number of large centres to allow economies of scale. The economics of such developments have tended to ignore the costs of travel by members of the public.

Only 2% of car drivers suggested that reducing the cost of the alternatives would make them change from the car. Once again this would require action by public transport operators with financial support from the government. 2% say that they would drive less if walking facilities were improved. Another 2% say that they would drive less if cycling facilities were improved. This would probably involve local government in providing more infrastructure in the form of cycle lanes and street lighting. Employers could provide more in the way of changing and showering facilities at the workplace for cyclists. Finally, 1% of car drivers say that they would cancel their activity and not make a trip at all.

From this analysis it seems that central and local government action could reduce about 38% of car driver trips, with assistance from local transport operators and retailers. About 33% of car driver trips would require initiatives by the individuals concerned, and about 29% are not likely to be reduced either because the driver is unwilling to consider an alternative or because the weather in this country cannot be changed.

9.2 The effects of the actions on the alternatives for car drivers

It is possible to see the alternatives associated with the various actions, as shown in Table 59. For those trips for which walk was identified as an alternative, it would be action by those individuals which would bring this about in 65% of cases. The government could encourage such action by means of publicity campaigns. It can do nothing about the weather, so it seems unlikely that these 17% of potential new walking trips will be realised. However, about 16% of the walking trips could be encouraged by local government action by making it easier to walk, particularly with children and the elderly and by encouraging the development of local shops and services.

Table 59 Contribution of each action to producing a shift to each of the alternatives by car drivers

Action	**No alternative**	**Walk**	**Bus**	**Cycle**	**Taxi**	**Train or tube**	**Public transport (not specified)**	**Someone else make trip**	**Would not make trip**	**Total**
No alternative	100	0	0	0	0	0	0	0	0	22
No specific action	0	39	15	28	44	6	42	3	0	21
Improve bus services	0	0	69	1	0	9	49	0	0	22
Take personal action	0	26	3	16	4	17	0	25	27	11
Improve the weather	0	17	1	19	0	0	0	0	0	7
Improve dependents' travel	0	5	7	4	0	8	3	25	0	5
Reduce the need to travel	0	6	2	8	0	5	0	47	38	4
Reduce the cost of travel	0	0	2	0	52	3	0	0	8	2
Improve walking facilities	0	5	1	1	0	0	5	0	4	2
Improve cycling facilities	0	0	0	24	0	0	0	0	4	2
Improve rail services	0	0	0	1	0	53	0	0	0	1
Cancel activity	0	2	0	0	0	0	0	0	20	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number	**351**	**500**	**496**	**114**	**48**	**26**	**26**	**34**	**25**	**1624**

Use of the bus could be encouraged by improving services according to 69% of the potential users. Another 7% would like it to be made easier to use bus with children and the elderly. Reducing the cost of using it would only influence 2% of potential users. For 15% no specific action is required: this suggests that they are potential users who need to be made aware of the potential benefits of bus use.

Many fewer people would choose cycling rather than walking or using public transport, but the main specific factor that would encourage them to do so would be improving cycling facilities which was mentioned by 24% of potential cyclists. The weather is even more of a deterrent to potential cyclists than to potential walkers with 19% of the former saying that it would need to improve. 44% of potential cyclists recognise that they either need to take personal action or that there is nothing specific that needs to be done to make them cycle. In many cases they probably have to find their old bicycles in the garage and get them going again.

The majority of potential taxi users are deterred by the cost. Of course it could be argued that taxis are cars so there is no benefit to society of a transfer from car driving to using a taxi. However, some people could probably manage without owning a car if they felt able to use taxis occasionally.

Use of the train or tube has a similar pattern to potential bus use, but with more people needing to take action by improving their own organisation, presumably because it would take longer to travel by rail. Once again, cost is not a major factor with only 3% of potential rail users mentioning it as a factor.

Those who mentioned public transport without being more specific were also less specific about the action that would be required to encourage them to use it. This suggests that they were rather vague about the possible alternatives. Given that they were a small number this does not present too much of a problem. However, many of them wanted an improvement to public transport.

Reducing the need to travel would be the main factor that would allow someone else to make the trip: presumably if it were a shorter trip, then there would be less need to accompany children by car. Similarly, if it were easier for children and the elderly to use other modes, the car would not have to be used to take them in some cases.

Of those who would not make the trip at all, for some people, there would need to be a reduction in the need to travel such as the introduction of a delivery service, or the activity would have to be cancelled. Others would need to take personal action such as making a phone call.

Whilst this is very interesting, it should be borne in mind that some of the alternatives would attract small numbers of car drivers. It is useful to see what actions would actually make a difference to the number of car drivers. Table 60 shows the relative overall effects, by showing the percentage of car drivers that would switch to a particular alternative in response to a given action. This is similar to Table 59, but the whole table sums to 100%, not just the individual columns.

Table 60 Overall effects of actions on the transfer of car driver trips to the various alternatives (percentages of all car driver trips)

Action	**No alternative**	**Walk**	**Bus**	**Cycle**	**Taxi**	**Train or tube**	**Public transport (not specified)**	**Someone else make trip**	**Would not make trip**	**Total**
No alternative	22	0	0	0	0	0	0	0	0	22
No specific action	0	12	5	2	1	0	1	0	0	21
Improve bus services	0	0	21	0	0	0	1	0	0	22
Take personal action	0	8	1	1	0	0	0	1	0	11
Improve the weather	0	5	0	1	0	0	0	0	0	7
Improve dependents' travel	0	2	2	0	0	0	0	1	0	5
Reduce the need to travel	0	2	1	1	0	0	0	1	1	4
Reduce the cost of travel	0	0	1	0	2	0	0	0	0	2
Improve walking facilities	0	2	0	0	0	0	0	0	0	2
Improve cycling facilities	0	0	0	1	0	0	0	0	0	2
Improve rail services	0	0	0	0	0	1	0	0	0	1
Cancel activity	0	1	0	0	0	0	0	0	0	1
Total	**22**	**31**	**31**	**7**	**3**	**2**	**2**	**2**	**2**	**100**

It can be seen that improving bus services to encourage bus use is by far the specific action most likely to attract people from their cars with 21% of car drivers mentioning it. After that, it is personal action to make people walk, identified by 8%, which increases to 20% if those not able to identify a specific action are included. Next, at 5%, comes the effect that improving the weather would have on encouraging walking if it were possible, and no specific action to encourage bus use. The former is very unlikely while the latter probably depends on increasing awareness of public transport and making it easier to use. These actions, plus those who would not identify an alternative, cover 73% of car driver trips. The other 27% are scattered across the alternatives and actions, particularly walk, bus and cycle which account for a further 19% of the car driver trips. This suggests that most actions to encourage alternatives to the car for short trips are not going to have a large effect. This does not necessarily mean that they are not worth doing, but they are not going to have much effect overall and probably should be focused on niche markets or be implemented without using many resources.

9.3 Actions to encourage the transfer of drivers to walking, cycling and bus

The effects of the various collective actions on the main alternatives of walk, bus and cycle are shown in Table 61. This shows the number of trips from the survey disaggregated by the detailed events as shown in Table 56. Table 61 emphasises that it is actions to improve bus services which are most likely to be effective in reducing the number of short car trips. It can be seen that improving bus routes and bus frequencies are the only collective detailed events that the respondents said would reduce car use by more than 5%. They said that improving travel for dependents, both the young and the old, would cause a shift to walk and bus of about 2%. This mainly means improving safety for walking and security, both walking and on buses.

The respondents indicated that reducing the need to travel would cause a small shift to all three alternatives, particularly walking. This means providing shops and other facilities locally, thereby reversing the trend of recent years. Reducing the cost of travel would not cause much difference, and would only affect bus out of these three alternatives. According to the surveys, improving walking and cycling facilities would each cause a reduction of about 2% in car driver trips, and refer to making it safer to walk and improving lighting in the case of walking, and proving better on-street facilities for cycling and shower and changing facilities at work for cyclists. Overall, it can be seen that collective actions could lead to a transfer of up to 25% of these car trips to bus, 5% to walk and 2% to cycle.

The differences between the totals for collective actions in Table 61 and the totals for each mode shown in Table 60 are the effects of the non-collective actions. The biggest difference is for walk (31% total, 5% collective, making a difference of 26%), compared with a difference of about 5 or 6% for the other two cases. Tables 62 to 64 shows all the events, both collective and non-collective that would reduce the number of car driver trips by at least 1% for the three alternatives.

Table 61 Effects of collective actions on switching to walk, bus and cycle by car drivers (percentages of all car driver trips)

	Walk	Bus	Cycle	Total for walk, bus and cycle
Bus routes improved	0	10	0	10
Bus frequency improved	0	6	0	6
Perception of public transport improved	0	2	0	2
Bus information improved	0	2	0	2
Public transport operated all night	0	1	0	1
Public transport links improved	0	0	0	0
Improve bus services	**0**	**21**	**0**	**21**
Local travel made safer for children	2	2	0	3
Transport improved for the old and disabled	0	1	0	1
Improve dependents' travel	**2**	**2**	**0**	**4**
Delivery service provided	0	0	0	0
Local shops improved	1	0	0	1
Local facilities improved	0	0	0	1
Telecommuting becomes available	0	0	0	0
Reduce the need to travel	**2**	**1**	**1**	**3**
Reduce the cost of travel	**0**	**1**	**0**	**1**
Local travel made safer	1	0	0	2
Street lighting improved	0	0	0	0
Improve walking facilities	**2**	**0**	**0**	**2**
Facilities for cyclists improved	0	0	2	2
Facilities provided at work	0	0	0	0
Improve cycling facilities	**0**	**0**	**2**	**2**
Train frequency and service improved	0	0	0	0
Local train service introduced	0	0	0	0
Improve rail services	**0**	**0**	**0**	**0**
Total	**5**	**25**	**2**	**32**

Table 62 shows the effects of actions to stimulate a shift from car to bus at the more detailed level. As discussed above, the most popular action would be to improve the route pattern of buses which could reduce car use by 10%. This implies that buses do not go where people wish to go. Secondly, the frequency of buses could be improved, which the respondents say would encourage another 6% to shift. Several other improvements would also help the shift. Two of these are to do with knowledge and perception of bus services. Another one is to make travelling on buses safer for children. Since buses are not intrinsically dangerous for children, this may also be more about perception than reality. Two other suggestions are to operate buses all night and to make bus fares cheaper. Given that the latter would only encourage a shift of 1% out of the 24% in total for buses, this suggests that any subsidy should go into improving service quality and quantity not reducing fares. In 5% of cases no specific action is required to encourage a shift to bus: better publicity about bus services might well help in these cases.

Table 62 Actions which could stimulate a shift from car to bus by car drivers

Collective actions	**% of short car trips that could shift**
Bus routes improved	10
Bus frequency improved	6
Bus information improved	2
Perception of public transport improved	2
Local transport made safer for children	2
Public transport operated all night	1
Cost of travel reduced	1
Non-collective actions	
No specific action	5

Note: Actions are only included in this table if at least 1% of car trips would shift as a result

Equivalent information for walking is shown in Table 63. This shows that there is not much that collective action can do to encourage a shift from car to walk. It appears that making walking safer and putting more facilities locally would help in 3% of cases. On the other hand, many car drivers (31%) indicated that they saw walking as a feasible alternative. This suggests that education and publicity, for example on the health benefits of walking, are required. Similarly, collective action is not going to do much to encourage cycling, as Table 64 shows. Improving facilities would encourage 2% of car drivers to cycle. However, as shown above, few people see cycling as an alternative, so publicity and education may not help much here.

Table 63 Actions which could stimulate a shift from car to walk by car drivers

Collective actions	**% of short car trips that could shift**
Local travel made safer	1
Local travel made safer for children	1
Local facilities and shops improved	1
Non-collective actions	
No specific action	12
Weather improved	5
Personal organisation improved	4
Travel during daylight hours	2
No lift offered	1

Note: Actions are only included in this table if at least 1% of car trips would shift as a result

Table 64 Actions which could stimulate a shift from car to cycle by car drivers

Collective actions	**% of short car trips that could shift**
Facilities for cyclists improved	2
Non-collective actions	
No specific action	2
Weather improved	1

Note: Actions are only included in this table if at least 1% of car trips would shift as a result

It is possible to use the categories in Table 58 to see to what extent action by government (central and local) might shift drivers from their cars. Table 65 shows this for the three main alternatives. It can be seen that actions by the government, in association with other bodies, could shift about 34% of short car trips. Of these, 25% would be to bus, 6% to walk and 3% to cycle. The other bodies that have the biggest role to play are public transport operators. Actions by individuals could have a significant effect, mainly causing a shift to walk. The key question is, how can they be stimulated to do so?

Table 65 Effects of the actions by various bodies on the shift from car to walk, bus and cycle (% of all short car driver trips being made)

	Walk	Bus	Cycle	Total (for walk, bus and cycle)
Central government, local government and public transport operators	2	24	0	26
Local government and retailers	2	1	1	4
Local government	2	0	0	2
Local government and employers	0	0	2	2
Individuals	21	6	3	30
Nobody (bad weather)	5	0	1	6
Total	31	31	7	69

9.4 The actions by trip length for car drivers

It is possible to see how the alternatives could affect car driver trips of various lengths, as shown in Table 66. The differences largely reflect the relationship between the actions and the alternatives, as discussed above. Thus, it seems that improving public transport would have more effect on the longer trips while taking personal action would affect the shorter trips more as would making it easier to take dependents, reducing the need to travel and improving walking and cycling facilities.

It is relevant to consider the distribution between the alternative modes for the trips of different lengths. It can be seen in Table 67 that very short trips (less than one mile) would shift mainly to walk (57%). Walk would also be the most popular choice for trips of between 1 and 2 miles. For longer trips bus is most popular. In all cases cycling has a share of about 9%, with little variation. This, together with Table 66, suggests that collective action would reduce the number of longer short trips by car rather more than the very short ones.

The impact of the actions on short car driver trips of various lengths is shown in Tables 68 and 69. The former shows the more aggregate level actions while the latter shows the more detailed events. It can be seen that the effect of collective actions on walking would be greatest for trips of under one mile, with 11% of these very short car trips amenable to collective action. Such actions have much less effect in transferring longer trips to walking. In the case of potential transfers to bus, most of the actions that would influence very short trips that could transfer to bus, are collective. The number of trips that would transfer to bus increases with trip length, but the proportion that would be influenced by collective actions decreases. In the case of transfers to cycling, collective actions would be most effective for very short trips.

Table 66 Impacts of actions on car driver trips of various lengths

Action	**<1 mile**	**1 to < 2 miles**	**2 to < 5 miles**	**Total**
No alternative	23	21	21	22
No specific action	18	22	21	21
Improve bus services	14	18	27	22
Take personal action	14	13	10	11
Improve the weather	7	10	6	7
Improve dependents' travel	7	4	4	5
Reduce the need to travel	6	4	4	4
Reduce the cost of travel	2	2	3	2
Improve walking facilities	5	2	1	2
Improve cycling facilities	2	2	2	2
Improve rail services	1	0	0	1
Cancel activity	1	1	1	1
Total	**100**	**100**	**100**	**100**
Number	**286**	**497**	**841**	**1624**

Table 67 Percentage of car driver trips shifting from car to walk, bus and cycle for different trip lengths

	< 1 mile	**1 to < 2 miles**	**2 to < 5 miles**	**Total**
Walk	57	47	29	39
Bus	23	34	48	39
Cycle	8	8	10	9

Table 68 Proportion of short car driver trips of various lengths that might change to modal alternatives as a result of various groups of collective actions

	< 1 mile			1 to < 2 miles			2 to < 5 miles			Total		
	Walk	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**
Improve bus services	0	13	0	0	17	0	0	26	0	0	21	0
Improve travel for dependents	4	2	1	1	2	0	1	2	0	2	2	0
Reduce the need to travel	3	0	1	1	0	1	1	1	0	2	1	1
Reduce the cost of travel	0	0	0	0	2	0	0	0	0	0	1	0
Improve walking facilities	4	1	0	2	0	0	1	0	0	2	0	0
Improve cycling facilities	0	0	2	0	0	0	0	0	1	0	0	1
Improve rail services	0	0	0	0	0	0	0	0	0	0	0	0
Total for collective actions	**11**	**15**	**4**	**5**	**21**	**1**	**3**	**30**	**2**	**5**	**25**	**2**
Total for all actions	**44**	**17**	**6**	**37**	**27**	**7**	**23**	**37**	**8**	**31**	**31**	**7**

Note: figures are percentages for that distance band

Table 69 Proportion of short car driver trips of various lengths that might change to modal alternatives as a result of various collective actions

	< 1 mile			1 to < 2 miles			2 to < 5 miles			Total		
	Walk	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**	**Walk**	**Bus**	**Cycle**
Bus routes improved	0	7	0	0	9	0	0	12	0	0	10	0
Bus frequency improved	0	4	0	0	3	0	0	9	0	0	6	0
Perception of public transport improved	0	1	0	0	1	0	0	2	0	0	2	0
Bus information improved	0	1	0	0	3	0	0	2	0	0	2	0
Public transport operated all night	0	1	0	0	1	0	0	1	0	0	1	0
Local travel made safer for children	4	1	0	1	2	0	1	2	0	2	2	0
Transport improved for the old and disabled	0	0	0	0	0	0	0	1	0	0	1	0
Delivery service provided	1	0	0	0	0	0	0	0	0	0	0	0
Local shops improved	1	0	0	1	0	0	1	1	0	1	1	0
Local facilities improved	1	0	1	0	0	1	0	0	0	0	0	0
Cost of travel reduced	0	0	0	0	2	0	0	0	0	0	1	0
Local travel made safer	3	0	0	2	0	0	0	0	0	1	0	0
Facilities for cyclists improved	0	0	2	0	0	0	0	0	1	0	0	1
Total for collective actions	**11**	**15**	**4**	**5**	**21**	**1**	**3**	**30**	**2**	**5**	**25**	**2**
Total for all actions	**44**	**17**	**6**	**37**	**27**	**7**	**23**	**37**	**8**	**31**	**31**	**7**

Note: figures are percentages for that distance band

In Table 68 the effects of policy interventions on the different trip lengths can be identified. For very short trips of less than one mile, improved bus services appear to be the most successful, potentially reducing car use by 13%. As Table 69 shows, it is improved bus routes and bus frequency that the respondents say would be most effective, even for such short trips. Walking needs to be made safer and more secure for both adults and children. These actions could reduce car use for these very short trips by 7%. No other initiatives would encourage more than 1% of these very short trips to transfer to walking. Similarly, whilst improving facilities for cyclists could reduce car use for these trips by 2%, nothing else would encourage more than 1% to shift to cycling. In fact, no action would shift more than 1% of car drivers for cycling for any of the three trip lengths shown in these tables. Making walking safer could reduce car use for the middle distance band by 2%, but none of the other actions would encourage more than 1% of the car driver trips in the distance bands to shift. Making travel easier for dependents would reduce car use for those driving short trips by about 7%, with transfer to all three alternatives, particularly walk. From the surveys, it can be seen that the various improvements to bus services would have larger effects on the longer trips. As implied above, none of the policies encourages much transfer from car to cycle, for any of the distance bands. Not surprisingly, improving rail services would do nothing to encourage transfer to these three modes.

Thus, it can be argued that the variation in the effectiveness of the policy instruments across trip lengths is not large and reflects the suitability of the three alternative modes to take people on trips of various lengths: walk the shortest and bus the longest. The main finding from this part of the analysis is that improving walking facilities by making the streets safer, and providing more local facilities, could reduce the number of very short car trips by about 11%. There are not all that many trips of this type.

9.5 The actions by type of trip for car drivers

As Table 70 shows, the various actions affect the trip purposes in different ways. Work and shopping trips would be shifted more than the overall average by improving public transport. Parents might switch away from the car to take their children to school if it were easier to accompany them when using alternative modes, and if certain personal changes occurred (such as getting up earlier). For other escort journeys, a switch away from the car could be achieved by improving the conditions for walking. Personal business trips could be undertaken by other modes if it were easier to take others and if the weather were better. Cheaper taxis could enable less use of the private car for social trips.

It is possible to carry out this analysis the other way round as shown in Table 71. This shows how each action would reduce the number of car driver trips for each trip purpose. Improving public transport seems to do the most to shift work and shopping trips. Taking personal action would have a significant effect on work trips. If it were possible to improve the weather this would have most effect on shopping and personal business trips. As would be expected making it easier to take dependents would have most effect on escort trips particularly to education. The trip purposes that would benefit most from reducing the need to travel are shopping, other escort, personal business and change mode. Improving walk and cycling facilities would do most for other escort trips while reducing the cost of travel would be most effective for reducing the number of car drivers making shopping, social and change mode trips. Cancelling the activity would have most effect on other escort, social and business trips.

Table 70 Effect of each action to reduce car driving on each trip purpose

Action	Work	Business	Shopping	Escort to education	Other escort	Personal business	Social	Change mode	Home and education	Total
No alternative	30	39	21	8	21	22	24	18	19	22
No specific action	16	20	22	23	16	20	23	31	24	21
Improve bus services	24	17	24	18	22	19	21	16	23	22
Take personal action	18	10	8	21	13	8	9	3	11	11
Improve the weather	4	3	9	6	6	11	5	10	8	7
Improve dependents' travel	1	0	3	18	6	10	3	4	5	5
Reduce the need to travel	1	1	6	3	5	5	3	8	5	4
Reduce the cost of travel	0	4	4	1	2	2	4	4	3	2
Improve walking facilities	1	2	1	1	4	2	2	3	3	2
Improve cycling facilities	2	0	1	2	2	0	3	1	2	2
Improve rail services	1	0	1	0	1	0	1	2	1	1
Cancel activity	0	2	1	0	2	1	2	0	0	1
Total	100	100	100	100	100	100	100	100	100	100
Number	203	23	197	74	207	82	205	67	566	1624

Table 71 How each action will reduce the number of car driver trips for each trip purpose.

Trip purpose	No alternative	No specific action	Improve bus services	Take personal action	Improve the weather	Improve dependents' travel	Reduce the need to travel	Reduce the cost of travel	Improve walking facilities	Improve cycling facilities	Improve train services	Cancel activity	Total
Work	18	10	14	20	7	2	4	2	5	14	9	0	12
Business	3	1	1	1	1	0	0	3	1	0	0	3	1
Shopping	12	13	13	8	16	8	17	18	4	10	9	7	12
Escort to education	2	5	4	8	4	17	3	3	1	5	2	0	5
Other escort	12	10	13	14	11	17	15	9	26	14	12	27	13
Personal business	5	5	4	4	8	11	6	4	4	1	0	7	5
Social	14	14	12	10	9	8	9	19	11	19	18	24	13
Change mode	3	6	3	1	6	7	7	6	6	3	9	0	4
Home and education	31	36	36	33	38	33	39	37	41	33	41	31	35
Total	100	100	100	100	100	100	100	100	100	100	100	100	100
Number	351	336	360	185	113	76	72	39	35	29	15	15	1624

9.6 The actions by area for car drivers

Another important dimension to the impacts of the potential actions of car drivers is to see how the five different areas would be affected as shown in Table 72. Improving public transport would have most effect in London which is interesting because already it has much better public transport than the other areas. The values are lowest in Hereford and Dorset which probably have the poorest public transport, particularly the latter. This suggests that action to improve public transport needs to be concentrated in areas where it is already relatively good, rather than where it is poor because in the latter case it is probably believed that it can never meet local needs.

Table 72 Impacts of actions on car driver trips in the five areas

Action	London	Leeds	Ipswich	Hereford	Dorset	Total
No alternative	12	16	13	35	27	22
No specific action	17	26	15	19	21	21
Improve bus services	23	23	25	20	21	22
Take personal action	12	17	11	6	9	11
Improve the weather	4	6	15	5	2	7
Improve dependents' travel	14	3	6	2	5	5
Reduce the need to travel	7	5	5	3	3	4
Reduce the cost of travel	1	1	4	3	3	2
Improve walking facilities	1	1	2	2	4	2
Improve cycling facilities	1	1	3	3	1	2
Improve train services	8	0	0	1	0	1
Cancel activity	0	0	0	2	3	1
Total	**100**	**100**	**100**	**100**	**100**	**100**
Number	**147**	**491**	**333**	**372**	**281**	**1624**

The need for personal action is most significant in Leeds, reflecting the fact that walk was seen as an alternative more there than elsewhere. The weather seems to be a more significant factor in Ipswich than elsewhere. This is not because the weather is worse there but because it is flatter than the other areas and so cycling was seen as an alternative by more people, and this is more sensitive to the weather than the other alternatives. This is also why improving cycling and walking facilities is more significant here than elsewhere. The need to make it easier to take dependents is highest in London, because cars are used rather more for this purpose here than elsewhere according to the surveys. It is interesting that reducing the need to travel is higher in London than elsewhere because the alternatives, particularly public transport are better in London than elsewhere. The car drivers in Ipswich seem to be most sensitive to reducing the cost of travel, for reasons which are not obvious. Not surprisingly the places where the person would be most likely not to be able to take part in the activity are Dorset and Hereford because of their high levels of rurality.

9.7 The actions that could make passengers shift from their cars

The events that could bring about the shift to the alternatives for car passenger trips hare been analysed in the same way as for car drivers. Table 73 shows the distribution between the various events. No car passengers in the survey identified `Improve rail services' as a factor that would make them cease to use the car for short trips. The distribution is fairly similar to that for car drivers. There is no specific action that would make them transfer to the alternative in 22% of cases (21% for car drivers). The next three actions in the list: improving bus services, taking personal action and improving the weather are in the same order as for car drivers, with similar percentage values. The other seven groups of reasons come in a different order for car passengers compared with drivers, but none of them was identified in more than 3% of cases.

The impact of these actions on each alternative mode is shown in Table 74. For buses the results are similar to those for drivers except that there is greater recognition of the need for personal action (12% compared with 3%) and less emphasis on improving bus services (57% compared with 69%). Car passengers are more inclined than car drivers to require the weather to improve before they will walk (21% compared with 17%). Taxis need to be made cheaper before 36% of those who mentioned them would switch to them. 53% of those mentioning cycling would require improvement to the facilities before they would switch, which is considerably higher than the 25% of car drivers saying this.

The overall effects of these various actions on the numbers switching from being a car passenger to each alternative are shown in Table 75. It is similar to the results for car drivers shown in Table 60. The largest factor is the 20% of car trips that could be reduced if public transport were improved. For drivers the value was 21%. The second largest value is the 11% who would switch to walking, but require no specific action to make them do so (12% for drivers). The only other actions that could shift over 5% of car passenger trips are taking personal action and improving the weather to make more people walk, and no specific action which would make more people travel by bus. The same factors would be effective for car drivers.

Table 73 Responsibility for implementing the actions to reduce the number of car passengers

Action	**No**	**%**	**Responsibility**
No alternative	62	24	-
No specific action	57	22	Individuals
Improve bus services	52	20	Public transport operators Central government Local government
Take personal action	35	13	Individuals
Improve the weather	20	8	Nobody
Reduce the cost of travel	9	3	Public transport operators Central government Local government
Cancel activity	9	3	Individuals
Reduce the need to travel	6	2	Local government Retailers
Improve dependents' travel	5	2	Public transport operators Central government Local government
Improve cycling facilities	4	1	Local government Employers
Improve walking facilities	3	1	Local government
Total	**263**	**100**	

Table 74 Contribution of each action to producing a shift to each of the alternatives by car passengers

Action	**No alternative**	**Bus+**	**Walk**	**Taxi**	**Cycle**	**Would not travel**	**Total**
No alternative	100	0	0	0	0	0	24
No specific action	0	22	35	50	19	0	22
Improve bus services	0	57	0	0	0	0	20
Take personal action	0	12	26	14	16	0	13
Improve the weather	0	3	21	0	12	0	8
Reduce the cost of travel	0	3	1	36	0	0	3
Cancel activity	0	0	6	0	0	68	3
Reduce the need to travel	0	1	5	0	0	32	2
Improve dependents' travel	0	3	2	0	0	0	2
Improve cycling facilities	0	0	3	0	0	0	1
Improve walking facilities	0	0	0	0	53	0	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number	**62**	**92**	**82**	**14**	**7**	**6**	**263**

Table 75 Overall effects of actions on the transfer of car passenger trips to the various alternatives

Action	**No alternative**	**Bus+**	**Walk**	**Taxi**	**Cycle**	**Would not travel**	**Total**
No alternative	24	0	0	0	0	0	24
No specific action	0	8	11	3	1	0	22
Improve bus services	0	20	0	0	0	0	20
Take personal action	0	4	8	1	0	0	13
Improve the weather	0	1	7	0	0	0	8
Reduce the cost of travel	0	1	0	2	0	0	3
Cancel activity	0	0	2	0	0	1	3
Reduce the need to travel	0	0	2	0	0	1	2
Improve dependents' travel	0	1	1	0	1	0	2
Improve cycling facilities	0	0	0	0	1	0	1
Improve walking facilities	0	0	1	0	0	0	1
Total	**24**	**35**	**31**	**5**	**2**	**2**	**100**

If policy actions are to be introduced to encourage shifts from car to the alternatives it is sensible to look at the more disaggregate level. Table 76 shows the detailed events that would have to occur to encourage a shift by car passengers to the alternatives of bus, walk and cycle. About 26% of car passenger trips could be shifted to walk, bus or cycle as a result of these collective actions, which is rather less than the figure of 32% for drivers. The totals for the three alternative modes are all slightly lower than the equivalent values for drivers. As before, it can be seen that improving bus services is the policy that would cause the biggest shift. Unlike drivers, car passengers rate improving frequency about improving route coverage, but these two are the biggest in both cases. Generally, the figures are similar to, but slightly lower than, the equivalent ones for car drivers.

All the actions which would cause shifts to bus, walk and cycling by car passengers are shown in Tables 77, 78 and 79 respectively, with the actions that are collective separated from those that are not. As indicated above, improving the frequency of buses could shift 8% of car passenger trips, and improving the route pattern could cause a shift of 7%. After these come making better information available, operating buses all night, making buses safer for children and making bus fares cheaper. These last two would only reduce car passenger trips by 1%. No specific action is required to make 8% of car passengers shift to bus, while another 3% would do so if they were not offered a lift.

As Table 78 shows, and was found for car drivers, very little in the form of collective action will encourage walking by car passengers. Improving local shops and facilities could shift 2% by enabling them to make shorter journeys which could be walked. There are a number of actions which would require personal motivation to make people switch, plus improvements to the weather.

Improving facilities for cyclists could shift 1% of car passenger trips, as Table 79 shows, but no other action appears likely to have much effect.

9.8 Conclusions on the effects of actions to reduce the number of car users

In this section the actions required to encourage a shift from car have been examined. As discussed above, about 78% of short car driver trips could be shifted to various alternatives, and slightly fewer car passenger trips. For car drivers, it has been calculated that about 38% of short car trips could be shifted with action from central and local government, in association with other organizations. About 33% would require personal action, and about 29% could not be reduced. Of the 38% which can be reduced with government action, most (about 26%) would be to public transport and so would need the co-operation of public transport operators. The rest would need assistance from retailers to provide more local shops, while help from employers would be required to provide facilities at work for cyclists and walkers, such as showers and lockers. Local government would have a role to play by encouraging the development of more local shops and other facilities (and preventing the development of more decentralised facilities). The 29% which could not be reduced can be divided between the 22% for which there is no alternative and the 7% which would require an improvement in the weather to make them shift.

Table 76 Effects of collective actions on switching to walk, bus and cycle by car passengers

	Walk	Bus	Cycle	Total for walk, bus and cycle
Bus routes improved	0	7	0	7
Bus frequency improved	0	8	0	8
Perception of public transport improved	0	0	0	0
Bus information improved	0	2	0	2
Public transport operated all night	0	2	0	2
Public transport links improved	0	0	0	0
Improve bus services	**0**	**19**	**0**	**20**
Local travel made safer for children	1	1	0	2
Transport improved for the old and disabled	0	0	0	0
Improve dependents' travel	**1**	**1**	**0**	**2**
Delivery service provided	0	0	0	0
Local shops improved	1	0	0	1
Local facilities improved	0	0	0	1
Telecommuting becomes available	0	0	0	0
Reduce the need to travel	**2**	**0**	**0**	**2**
Reduce the cost of travel	**0**	**1**	**0**	**1**
Local travel made safer	1	0	0	1
Street lighting improved	0	0	0	0
Improve walking facilities	**1**	**0**	**0**	**1**
Facilities for cyclists improved	0	0	1	1
Facilities provided at work	0	0	0	0
Improve cycling facilities	**0**	**0**	**1**	**1**
Train frequency and service improved	0	0	0	0
Local train service introduced	0	0	0	0
Improve rail services	**0**	**0**	**0**	**0**
Total	**4**	**21**	**1**	**26**

Table 77 Actions which could stimulate a shift from being a car passenger to travelling by bus

Collective actions	**% of short car trips that could shift**
Bus frequency improved	8
Bus routes improved	7
Bus information improved	2
Buses operated all night	2
Local travel made safer for children	1
Cost of travel reduced	1
Non-collective actions	
No specific action	8
No lift offered	3

Note: Actions are only included in this table if at least 1% of car passenger trips would shift as a result

Table 78 Actions which could stimulate a shift from being a car passenger to walking

Collective actions	**% of short car trips that could shift**
Improve local facilities and shops	2
Non-collective actions	
No specific action	11
Weather improved	7
Personal organisation improved	3
No lift offered	3
Travel during daylight hours	2
Cancel business meeting	2

Note: Actions are only included in this table if at least 1% of car passenger trips would shift as a result

Table 79 Actions which could stimulate a shift from being a car passenger to cycling

Collective actions	% of short car trips that could shift
Facilities for cyclists improved	1

Note: Actions are only included in this table if at least 1% of car passenger trips would shift as a result

The figures are similar for car passengers, but only about 29% of short trips could be shifted with action from central and local government in association with other organizations. 38% would require personal action, and 32% could not be reduced.

The action that would do most to attract drivers away from their cars is to improve bus services. 21% of short car driver trips could be attracted to bus. The main actions that are required are improvements to the route pattern (10%) and improvements to frequency (6%). Another 1% would like them to operate all night. This demonstrates a key difference between the car and public transport: the car is available when the you want it and goes where you want it to. Hence there is a need to make public transport more like the car in terms of its spatial and temporal characteristics. It is likely that many car drivers never use public transport. It is important to improve their perception of public transport and to provide better information. Some car drivers want buses to be made safer for children to use: this is an area when perceptions need to be changed. Only a small number of car drivers (1%) wanted buses to be made cheaper. Another 5% identified buses as an option, but did not identify any specific action. These people could probably use the bus now but prefer to use their cars out of convenience and availability. Improving bus services would reduce the number of work and shopping trips more than other trip purposes.

The figures are similar for car passengers, with 20% of these car trips potentially transferring as a result of improvements to bus services, of which 8% would transfer if bus frequencies were improved and 7% if bus route coverage were better.

Improvements to the route pattern and frequency of buses can happen under present legislation. Local authorities can invite operators to tender for socially-necessary routes, that is, ones which the market does not provide. This may require extra funding from central government to help cover the extra costs. It is also important that the quality of bus journeys improves so that the difference from a car is less. Then the improved services need to be marketed to improve the perception of public transport and greatly improved information needs to be made available.

It is much more difficult to provide investment to encourage walking and cycling. Only 5% of car driver trips would be influenced to change to walking as a result of collective actions. These are mainly to do with making walking safer and the creation of more local centres so that trips could be walked rather than be by car. Most of those who said that they could walk did not identify any specific action that would cause them to shift. This implies that they could walk, but use the car because it is available and convenient. This suggests that there is a need to encourage people to walk by making them aware of the benefits, for example, through education and publicity. Some people recognised that they needed to improve their own (or their children's) organisation. Some others could walk, but would have to do so during daylight hours. It may be that some of them would walk if the streets were made safer, perhaps by means of better lighting and encouraging more activity on the streets of a non-threatening form. Government and other bodies can help by increasing awareness of the benefits of walking.

Similarly, there is little public action that will attract people out of their cars on to bicycles: 2% of drivers said that improvements to cycling facilities would be required to make them transfer. About 2% could transfer, but did not identify any specific action that would make them do so.

Cost seems to be the main factor deterring people from using taxis. Perhaps there needs to be more opportunity to share taxis, thereby producing a service that is somewhere between the bus and the taxi: responsive to demand, but not as dear as a taxi.

Action by the government and other organisations could do most to reduce the number of longer short car trips because these are the ones that are more likely to transfer to bus. The shortest trips are more likely to transfer to walk and so the motivation for transfer will need to come from the individual.

Improving public transport would do more to encourage drivers out of their cars in urban areas than rural areas. This suggests that if reducing car use is the objective it is better to concentrate resources in areas where the service is already quite good than in areas where it is poor.

Topography does play some part. Walking and cycling are seen as more attractive alternatives in flat areas than hilly ones.

10 THE TRAFFIC IMPLICATIONS OF THESE EFFECTS

10.1 Calculation of the impacts at a national scale

All the analysis so far has been in terms of the trips in the survey. It is possible to estimate the effects on all car trips in Great Britain. It must be recognised that interpreting the results from 377 interviews at a national scale implies some rather large assumptions. The respondents were selected at random from stratified samples in the five areas to represent different types of areas ranging from dense urban to rural, and so the results are representative. It should also be borne in mind that the focus of this work is short trips (less than 5 miles), and so some of the policies and other actions would also reduce rather longer trips, so some of the estimates may be on the low side for this reason. Against this must be balanced the fact that the actions mentioned here are very unlikely, on their own, to reduce car use. They need to be associated with policies to discourage car use, such as congestion charging and workplace parking levies. These figures may represent the maximum impact of various initiatives. What these results show is the relative impacts of the various actions and where the emphasis in funding and education should be placed in trying to provide attractive alternatives to the car.

Table 80 shows the total number of trips and the total distance driven by car per head from the National Travel Survey. The total distance driven by all car drivers has been calculated by multiplying these figures by the population of Great Britain, 57.3 million. These figures are all approximations, but are sufficiently precise for the purpose of demonstrating at a national scale, the possible scale of the impacts identified in the survey. It should be noted that only car driver trips are being considered here as the purpose of these calculations is to estimate the possible reduction in car traffic. Including car passenger trips would introduce an element of double counting. Car trips being made especially for car passengers are taken into account because they are `escort' trips.

Table 80 Travel by car drivers from the National Travel Survey, per head and scaled up for Great Britain

	Average annual travel driven by car per head		**Total annual travel driven by car in Great Britain**	
	Short trips	All trips	Short trips	All trips
Number	231	409	13236.3 million	23435.7 million
Distance (miles)	494.5	3488	28334.85 million	199862.4 million

Note: The population of Great Britain has been taken as 57.3m.
The annual distance for short trips has been calculated using the mean distance travelled in the three distance bands (0-1 mile, 1-2 miles and 2-5 miles), using figures supplied as special tabulations from NTS.

Source: Trips per head - NTS, 1996-98.
Population of GB - Transport Statistics Great Britain, 1999

10.2 The impacts on short car trips at a national scale

Tables 81 and 82 show the effects at a national scale of the various actions identified previously in Section 9.

Table 81 shows not only the reduction in the number of trips but also the reduction in distance by car that could occur. The millions of short trips and millions of miles on short trips that could potentially be reduced have been calculated by applying the equivalent percentage reductions found in the survey to the national figures for short trips shown in Table 80. (The reductions in the distances were calculated by using the reductions in each of the three distance bands from the survey and applying this to the total distance travelled per head annually in those distance bands). These total reductions were then divided by the total number of trips and the total distance on all car trips to calculate the percentage reductions. The percentage figures are shown to one decimal place to show the relative impacts of all the actions, some of which would otherwise appear as zero. It should be borne in mind that a reduction of 0.1% would mean over 13 million fewer car trips or 23 million fewer car miles, neither of which are trivial. Few of the actions would be introduced in isolation, so the figures permit the calculation of the possible cumulative effects.

The detailed impacts of the actions will be considered in terms of the effects on all travel rather than just the effects on short trips since it makes little sense to consider only the latter. It is worth noting that the percentage reductions in the number of trips and the distance travelled are similar, but that actions that encourage a switch of longer trips will have a greater reduction in the distance travelled than one that encourages a switch of shorter trips. Policies which encourage more walking will have relatively less impact on the distance travelled than policies that encourage switching to bus. If it is desired to reduce the amount of traffic on the road then policies to encourage switching to bus are more likely to be successful than ones to encourage walking or cycling. On the other hand if the concern is about the number of trips, for example the number of cold starts of car engines, then it may be more sensible to focus on policies that cause reductions in the number of trips.

The non-collective actions in Table 82 have been included for comparison so that the level of possible control that the government and other agencies have can be seen. It can be seen that the overall totals in Tables 81 and 82 are similar, suggesting that if the 21% or so of car trips for which it is claimed there is no alternative are discounted, collective action could remove about half the remaining trips. It may be possible to do something about the trips classified as non-collective actions. For example, while it is not possible to improve the weather in this country, it may be possible to mitigate the worst effects, for example by providing more bus shelters.

Table 81 Effects of collective actions on reductions in total short trips by car annually in Great Britain

	Reduction in trips		Reduction in distance	
	Million trips	**%**	**Million miles**	**%**
Bus routes improved	1390	10.5	3196	11.3
Bus frequency improved	847	6.4	2186	7.7
Perception of public transport improved	265	2.0	668	2.4
Bus information improved	251	1.9	576	2.0
Public transport operated all night	146	1.1	412	1.5
Public transport links improved	40	0.3	88	0.3
Improve bus services	**2939**	**22.2**	**7126**	**25.1**
Local travel made safer for children	556	4.2	793	2.8
Transport improved for the old and disabled	79	0.6	220	0.8
Improve dependents' travel	**635**	**4.8**	**1013**	**3.6**
Delivery service provided	225	1.7	424	1.5
Local shops improved	185	1.4	376	1.3
Local facilities improved	159	1.2	268	0.9
Telecommuting becomes available	13	0.1	28	0.1
Reduce the need to travel	**582**	**4.4**	**1096**	**3.9**
Reduce the cost of travel	**318**	**2.4**	**690**	**2.4**
Local travel made safer	238	1.8	248	0.9
Street lighting improved	53	0.4	56	0.2
Improve walking facilities	**291**	**2.2**	**304**	**1.1**
Facilities for cyclists improved	212	1.6	358	1.3
Facilities provided at work	26	0.2	82	0.3
Improvements cycling facilities	**238**	**1.8**	**440**	**1.6**
Train frequency and service improved	79	0.6	248	0.9
Local train service introduced	40	0.3	96	0.3
Improve rail services	**119**	**0.9**	**344**	**1.2**
Total	**5122**	**38.7**	**10913**	**38.5**

Table 82 Effects of non-collective actions on reductions in total short trips by car annually in Great Britain

	Reduction in trips		Reduction in distance	
	Million trips	**%**	**Million miles**	**%**
No specific event	2740	20.7	5920	20.9
Weather improved	913	6.9	1693	6.0
Personal organisation improved	728	5.5	1325	4.7
No lift offered	371	2.8	718	2.3
Travel during daylight hours	331	2.5	690	1.7
Cancel visit to relative or friend	79	0.6	224	0.8
Buy a bicycle	53	0.4	120	0.4
Cancel business meeting	26	0.2	104	0.0
Cancel social activity	13	0.1	46	0.2
Cycle at lunchtime	13	0.1	22	0.1
Total	**5267**	**39.8**	**10862**	**38.3**

10.3 The effects on all car trips nationally

Table 83 shows the effects of the reductions in the numbers of trips and the distance travelled for all car trips (not just short ones). These have been calculated by dividing the reductions in the numbers of trips and distance travelled as a result of each action in Table 81 by the totals for all trips in Table 80.

It can be seen that overall, these actions could lead to a reduction of about 22% in the number of trips, and a reduction of about 5 or 6% in the distance travelled. The reason why there is a bigger differential in the two reductions than in Table 82 is that only short trips are being considered here, and it is being assumed that longer trips stay the same, hence the smaller reduction in the distance travelled.

As discussed previously, the largest reduction in the number of car trips would come from improvements to bus services, where about 12 or 13% of car trips could be reduced, and about 4% of the total distance travelled by car. According to NTS about 25% of bus trips are over 5 miles long, so there could be a greater reduction in the distance travelled than implied here.

Table 83 Effects of collective actions on reductions in total annual car use in Great Britain

	% reduction in car trips	% reduction in car distance
Bus routes improved	5.9	1.6
Bus frequency improved	3.6	1.1
Perception of public transport improved	1.1	0.3
Bus information improved	1.1	0.3
Public transport operated all night	0.6	0.2
Public transport links improved	0.2	0.0
Improve bus services	**12.5**	**3.6**
Local travel made safer for children	2.4	0.4
Transport improved for the old and disabled	0.3	0.1
Improve dependents' travel	**2.7**	**0.5**
Delivery service provided	1.0	0.2
Local shops improved	0.8	0.2
Local facilities improved	0.7	0.1
Telecommuting becomes available	0.1	0.0
Reduce the need to travel	**2.5**	**0.5**
Reduce the cost of travel	**1.4**	**0.3**
Local travel made safer	1.0	0.1
Street lighting improved	0.2	0.0
Improve walking facilities	**1.2**	**0.2**
Facilities for cyclists improved	0.9	0.2
Facilities provided at work	0.1	0.0
Improve cycling facilities	**1.0**	**0.2**
Train frequency and service improved	0.3	0.1
Local train service introduced	0.2	0.0
Improve rail services	**0.5**	**0.2**
Total	**21.9**	**5.5**

Of the ways of improving bus services, improving the coverage of bus routes and the frequency of buses would do most, and are the only detailed events of those discussed here that would reduce car use nationally by over 1%. Improving the perception of public transport and providing more information about bus services would have effects on car use greater than most of the other specific actions listed.

The second largest group of actions would be to make travelling with dependents, particularly children, safer and easier. The first of these, making local travel safer for children applies almost equally to walking and bus as alternatives. It reflects a combination of concern about road safety and danger from strangers. It could reduce the number of car trips by over 2%, and the distance by about 0.4%. The latter value is low because many of these trips are short, often taking children to school.

The next category is important because it could mean fewer trips, not just fewer car trips. Reducing the need to travel by car on short trips could reduce the total number of car trips by between 2 and 3% and reduce the distance travelled by about 0.5%. The main contributor would be providing a delivery service, but improving local shops and other facilities would also help. Telecommuting is not seen as a major contributor to reducing car use, but probably would have a larger effect on longer trips.

Reducing the cost of travel on short trips could reduce the number of car trips by 1.4% and the distance travelled by 0.3%. Most of these would use a taxi as an alternative. This is an example where the action would also reduce the number of longer trips. Short trips are likely to be fairly cheap, so it is unlikely that cost is a major factor in deterring people from using the alternatives, except, as already mentioned, taxi, which may be the only viable alternative for some trips, particularly for those with mobility difficulties, such as some elderly people.

Improvements to the facilities for walking and cycling could each reduce the number of trips by about 1% and the distance travelled by about 0.2%. By definition these would tend to be short trips, particularly the ones that could be walked.

Finally, improvements to rail services could reduce the number of short car trips by about 0.5%, and the distance travelled by about 0.2%. This would involve both improving existing services and introducing new local services. One would expect this to have a greater effect on longer trips.

10.4 Effects of actions to increase use of particular modes nationally

It is possible to calculate the effects on car use of actions aimed at increasing the use of specific modes. Table 84 shows the effects of policies to increase bus use, Table 85 shows the equivalent for walking, and Table 86 the values for cycling policies. Finally, for comparison, the effects of non-collective actions on car use nationally, are shown in Table 87. It should be noted that in Tables 84 to 86 the effects of the actions on car use have been allocated to the three modes in proportion to the number of trips that would be attracted to each alternative according to the survey. For example, those saying that making local travel safer for children would lead to a shift from the car, would choose bus, walking and cycling as alternatives in the ratio of 0.9 on bus, 0.9 walking and 0.1 cycling, and this is how they have been allocated in the tables.

Table 84 Effects of actions to increase bus use on the reduction in total annual car use in Great Britain

	% reduction in car trips	% reduction in car distance
Bus routes improved	5.9	1.6
Bus frequency improved	3.6	1.1
Perception of public transport improved	1.1	0.3
Bus information improved	1.1	0.3
Local travel made safer for children	0.9	0.2
Public transport operated all night	0.6	0.2
Cost of travel reduced	0.4	0.1
Transport improved for the old and disabled	0.3	0.1
Local shops improved	0.2	0.0
Local facilities improved	0.1	0.0
Local travel made safer	0.1	0.0
Street lighting improved	0.1	0.0
Public transport links improved	0.0	0.0
Total	**14.4**	**4.0**

Table 84 shows that policies to increase the use of bus to replace car for short trips could reduce the number of car trips by about 14%. This is slightly higher than the figure for improvements to bus services in Table 83 because here actions not specifically aimed at increasing bus use, such as improving local shops and facilities, are included because they could contribute in a minor way. The reduction in car distance would be about 4%. The main factors are as before, namely improving the spatial and temporal coverage of bus services.

As shown in Table 85, the number of short trips by car could be reduced by about 3% when policies which encourage walking, including ones not directly aimed at walking. Safety is the main concern here, followed by improving local facilities and shops. Policies aimed at increasing cycling, shown in Table 86, could reduce the number of car trips by between 1 and 2%, and the total distance travelled by car by about 0.3%. Improving the facilities for cyclists, such as cycle lanes, would be the main factor here.

Table 85 Effects of actions to increase walking on the reduction in total annual car use in Great Britain

	% reduction in car trips	% reduction in car distance
Local travel made safer for children	0.9	0.2
Local travel made safer	0.8	0.1
Local shops improved	0.6	0.1
Local facilities improved	0.2	0.0
Delivery service provided	0.2	0.0
Street lighting improved	0.1	0.0
Bus frequency improved	0.0	0.0
Facilities provided at work	0.0	0.0
Total	**2.9**	**0.4**

Table 86 Effects of actions to increase cycling on the reduction in total annual car use in Great Britain

	% reduction in car trips	% reduction in car distance
Facilities for cyclists improved	0.9	0.2
Local facilities improved	0.3	0.1
Local travel made safer for children	0.1	0.0
Facilities provided at work	0.1	0.0
Train frequency and service improved	0.0	0.0
Local shops improved	0.0	0.0
Local travel made safer	0.0	0.0
Total	**1.5**	**0.3**

In all three cases, several of the actions relate to making the local environment safer and improving local shops and facilities. This suggests the need for better neighbourhood planning, so that people are able to meet their needs locally and to walk, cycle or travel by bus.

As discussed above, non-collective actions could reduce total car use by about the same amount as the collective actions. This is shown by comparing the totals in Tables 83 and 87. Table 87, showing the non-collective actions, indicates that over 10% of car trips do not require specific action to reduce them. As discussed previously, this is mainly related to those who could walk but simply cannot be bothered. Hence they need to be educated into the benefits of walking. Also as mentioned above, the weather cannot be changed, but action can be taken to make travelling by other means easier in bad weather. It is not obvious that very much could be done to improve people's own organisation. Many of these trips involve taking children to school, where the problem is getting the children into action in the morning, so perhaps part of the answer here is to educate children into not being taken by car and to take appropriate action like getting up earlier. (Many parents may regard any such policies as rather optimistic). This relates to the next factor of not offering a lift. This would require others to use an alternative to the car, and so might follow from policies to encourage them to consider alternatives. Having to travel during daylight hours is another example where collective action might help: for example better street lighting might reduce the perceived risk of walking, and providing more local facilities might mean that some people would be prepared to travel after dark if it is only a short journey. The other factors are all small and relate to either not making the trip or taking action to make cycling possible.

Table 87 Effects of non-collective actions on reductions in total annual car use in Great Britain

	% reduction in car trips	**% reduction in car distance**
No specific action	11.7	3.0
Weather improved	3.9	0.8
Personal organisation improved	3.1	0.7
No lift offered	1.6	0.4
Travel during daylight hours	1.4	0.3
Cancel visit to relative or friend	0.3	0.1
Buy a bicycle	0.2	0.1
Cancel business meeting	0.1	0.1
Cancel social activity	0.1	0.0
Cycle at lunchtime	0.1	0.0
Total	**22.5**	**5.4**

10.5 Effects on the alternative modes nationally

Table 88 shows the total number of car trips under 5 miles, walk, bus and cycle trips. These have been estimated by multiplying the number of trips per head from NTS by the population. It is then possible to calculate the effects of various reductions in car use on the transfers to the other modes. Table 89 shows the effects of 1%, 5% and 10% reductions in car use. The shifts to the other modes have been calculated by applying the proportions of car trips which might shift to walk, bus or cycle (excluding those who could not identify any alternatives). It has been assumed that the relationships are linear (that is, that the proportions shifting to the alternatives are independent of the size of the shift). It can be seen that a 1% shift from the car would cause a 0.3% increase in the number of walk trips, a 1.5% increase in the number of bus trips and a 1.3% increase in the number of cycle trips. (In fact there are currently more walk trips than indicated here because NTS ignores ones under 50 yards, so the percentage growth in walk trips would be smaller). These differences reflect the much larger number of walking trips than bus or cycle trips. A key issue, outside the scope of this work, is what scale of car trip reduction can be produced. For any overall potential reduction in car use the research here can help to calculate the potential shifts to the alternatives, as well as indicating which types of trip are most likely to be reduced.

Table 88 Estimates of total numbers of trips in Great Britain by various modes

	Car driver < 5 miles	**Walk**	**Bus**	**Cycle**
Trips per head	231	288	62	16
Total number of trips in GB	13236.3m	16502.4m	3552.6m	916.8m

Note: The population of Great Britain has been taken as 57.3m
Source: Trips per head - NTS, 1996-98
Population of GB - Transport Statistics Great Britain, 1999

Table 89 Increases in overall numbers of walk, bus and cycle trips for various levels of reduction in car trips

Reduction in car trips		**Increase in walk trips**		**Increase in bus trips**		**Increase in cycle trips**	
%	No	%	No	%	No	%	No
1	132.4m	0.3	52.0m	1.5	51.6m	1.3	11.9m
5	661.8m	1.6	260.0m	7.3	257.8m	6.5	59.3m
10	1323.6m	3.1	519.9m	14.5	515.7m	12.9	118.6m

Overall, a reduction in car trips would have most effect on the number of bus trips, followed by the number of cycle trips. The number of walk trips is so large already that the growth would be relatively small for a particular level of shift.

10.6 Conclusions about the national implications of these findings

It has required some substantial assumptions to interpret the results from the surveys at a national scale. Nonetheless, it is useful to estimate the overall impact of the types of actions and policies being considered here. In order to do this, the survey results have been scaled up using factors from the NTS. The impact on all travel, not just short trips, has been considered.

The various actions identified in the surveys could reduce the total number of car trips by about 22% and the total distance travelled by about 5 or 6%. Actions which increase bus use could reduce the number of car trips by about 14% and the distance travelled by about 4%. Actions which increase walking and cycling could reduce the number of car trips by about 3% and 1.5% respectively, and the distance travelled by car by about 0.3 to 0.4% each. The policies that would do most to reduce car use are improving bus route coverage and bus frequency. Neighbourhood planning to make the local environment safer and improve local facilities would also help reduce car use for short trips. Many car trips could be transferred to the alternatives if drivers and their passengers could be made more aware of the benefits of walking and the environmental damage caused by the car, and if this awareness could be translated into action.

Overall, the actions and policies discussed here could make a significant difference to the number of car trips, and a smaller, but non-trivial difference to the total distance travelled by car. The key question is whether the actions that the respondents mentioned actually would make people transfer from their cars. The answer is, probably not without strong policies to reduce car use. What the results here show is that if such policies were introduced, there would be alternatives for the majority of short car trips, and that there would be a noticeable difference in the levels of traffic on the road.

11 MAKING BETTER TRIPS

11.1 How trips could be made better

The surveys focused on a number of real trips, in terms of why the car was used, what the alternatives were and what would make the respondent switch to them. Questions were also asked about ways in which the respondents thought that the trips could be made better. These included making the trip in a way that is more friendly to the environment, to make it more enjoyable for themselves or their passengers, and alternative ways of making the same trip if it were being made the next week.

The questions were asked about groups of consecutive short trips. There are a total of 807: 670 by drivers and 137 by passengers. The analysis examines the results by sex and age to see if there are any systematic patterns.

11.2 Making the trips in ways that are more friendly to the environment

As Table 90 shows, about 54% of the respondents could see ways of making the trip in ways that were more friendly to the environment. Whilst that might be regarded as quite high, it means that 46% could not. This is rather surprising since the same respondents were able to identify alternatives to the car for over 75% of the trips made.

Many of them did suggest ways that reflected the alternatives previously identified: walking, cycling and public transport. Other suggestions included combining trips, delivery and greener petrol. Three examples illustrate some of the thinking:

Perhaps I could have saved the trip until further items were needed.

I could have got the video on my way home from work and my son could have walked.

We could go to a more local pub.

Some other people did not really seem to understand the issue:

I am concerned about the environment, but not on this occasion as the car is useful for a short trip

I could have used a bus but they pollute the environment even more than a car

Table 90 suggests that women are more willing to consider ways of making journeys that are more friendly to the environment. This difference may reflect the different types of trips made by males and females, with men making more trips for which they believed there was no alternative.

Table 90 Differences by sex in whether the respondents could see ways of making the trip in a way that is more friendly to the environment

	Male	Female	Total
Yes	52	56	54
No	48	44	46
Total	**100**	**100**	**100**
Number	**364**	**443**	**807**

There is a large difference between the age groups, as Table 91 shows, with the young much more willing to consider the environment than the old: 69% compared with 45%. This reflects the much greater willingness of young drivers to identify alternatives to the car and to consider cycling and using public transport that was found earlier.

Table 91 Differences by age in whether the respondents could see ways of making the trip in a way that is more friendly to the environment

	0-29	30-59	60+	Total
Yes	69	54	45	54
No	31	46	55	46
Total	**100**	**100**	**100**	**100**
Number	**96**	**527**	**182**	**807**

Note: The total includes two respondents with unknown ages

11.3 Making the trip better for the travellers

A different approach to make people think of alternatives to the car is to ask them if they can see ways of making the trip more enjoyable for themselves or for their passengers. As Table 92 shows, 25% of the respondents could think of ways to make the trip more enjoyable for themselves. Women were more able to think of ways of doing so than men. As Table 93 shows, the elderly were least able to think of ways of making the trip more enjoyable. This may partly reflect they difficulty many of them had in finding alternatives to the car.

Table 92 Differences by sex in whether the respondents could see ways of making the trip more enjoyable for themselves

	Male	Female	Total
Yes	23	26	25
No	77	74	75
Total	**100**	**100**	**100**
Number	**364**	**443**	**807**

Table 93 Differences by age in whether the respondents could see ways of making the trip more enjoyable for themselves

	0-29	30-59	60+	Total
Yes	26	27	18	25
No	74	73	82	75
Total	**100**	**100**	**100**	**100**
Number	**96**	**527**	**182**	**807**

Note: The total includes two respondents with unknown ages

The sorts of answers given included walking and cycling. Often this was seen as a way to keep fit. Two good examples of the benefits of using the bus are:

Going by bus to have time to read the newspaper.

By using the bus: you meet people in this situation.

An interesting example is the man who said:

If my wife travelled in a different way, I could have a lie in.

Some people did not quite enter the spirit of the question. For example, one person said that the way to make the journey better would be to:

Remove the bus lanes.

Presumably he could then drive his car faster. Another respondent's way of making the trip better was to:

Stay in the pub longer

As Tables 94 and 95 show, far fewer people could think of ways of making the journey more pleasant for the passengers. 8% of both males and females gave a positive answer here. The age group most able to think of suitable ways were the middle-aged. Most of the suggestions were based on walking:

Walking would be good for them.

It would be better for the children to walk, but they would have to get up earlier.

Walking is more interesting for the children. They see more and talk more.

An example of a way public transport could be better for a car passenger was:

It's possible to read on the train.

Table 94 Differences by sex in whether the respondents could see ways of making the trip more enjoyable for the car passengers

	Male	**Female**	**Total**
Yes	8	8	8
No	92	92	92
Total	**100**	**100**	**100**
Number	**364**	**443**	**807**

Table 95 Differences by age in whether the respondents could see ways of making the trip more enjoyable for the car passengers

	0-29	**30-59**	**60+**	**Total**
Yes	5	9	6	8
No	95	91	94	92
Total	**100**	**100**	**100**	**100**
Number	**96**	**527**	**182**	**807**

Note: The total includes two respondents with unknown ages

11.4 Alternatives next week?

A more explicit way to see if people might do things a different way is to ask them if they were to make the same trip the next week would they consider an alternative. As Tables 96 and 97 show, 17% said that they were prepared to do so. Slightly more females than males thought that they might consider an alternative. Once again, there are large differences between the age groups with 27% of the young who said that they would consider an alternative compared with only 9% for the elderly.

Table 96 Differences by sex in whether the respondents would consider making the trip in an alternative way if they were to make it again next week

	Male	**Female**	**Total**
Yes	16	18	17
No	84	82	83
Total	**100**	**100**	**100**
Number	**364**	**443**	**807**

Table 97 Differences by age in whether the respondents would consider making the trip in an alternative way if they were to make it again next week

	0-29	**30-59**	**60+**	**Total**
Yes	27	17	9	17
No	73	83	91	83
Total	**100**	**100**	**100**	**100**
Number	**96**	**527**	**182**	**807**

The total includes two respondents with unknown ages

Some simply said that they would consider using another mode:

I might consider using the bus;

I might walk if I have time;

I might get the bike serviced and start cycling to and from work.

Others were thinking in terms of linking trips together:

I would probably link it up with other things I had to do;

I could time the visit to my daughter with another trip and make my son walk home;

I would get the video on my way home from work.

An example that was given for a shopping trip was:

By using the internet or a catalogue.

11.5 Conclusions on ways of making better trips

This section has illustrated the views of the respondents about ways in which their short trips by car could be changed. Over half the respondents could see ways in which their trips could be made in ways that are more friendly to the environment, but only 17% said that they would consider making the same trip in a different way if they made it again next week. About a quarter of the respondents could identify ways of making the trip more enjoyable for themselves, but few could think of ways of improving it for passengers. The main finding that comes out of this analysis is that the young are much more able to see ways of making the trip in a way that is environmentally friendly, and are more willing to consider alternative ways of making the trip.

12 CONCLUSIONS

12.1 Conclusions on the approach

This report has presented the findings from in-depth interviews with 377 people who have made short trips by car. The analysis has focused on why they used their cars for the trips, whether there are any alternatives to the use of the car, what they are, and what actions would be required to make them choose the alternative. The study has focused on the positive factors which would attract car users to the alternatives. It was not part of the brief to estimate what scale of action would be required to make them reduce their car use. However, a number of initiatives that will make car use less attractive may be introduced, including congestion charging and workplace parking levies. It will be important to offer alternatives to the car as part of a package of measures. The research being reported here helps to identify which of the alternatives are likely to be attractive and what is needed to increase their use by car users. This work also helps to identify the policy areas where action should be targeted in order to help maximize the potential reductions in car use.

A key element of this work is that it has involved the examination of real car trips and the alternatives perceived by those undertaking them. There have been other studies which simply asked people's views on the alternatives, for example asking respondents what would make them cycle more. Carrying out household interviews meant that it was possible to obtain the information within the context of the respondents' lifestyles, constraints, perceptions and environment.

It should be borne in mind that this research has concentrated on the alternatives to the car that car users perceive and what would make them choose them, rather than on the policies that might make them give up their cars, for example congestion charging. It should recognised that the actions identified in these surveys are unlikely, on their own, to reduce car use significantly, and that policies that increase the cost of using the car or restrict its use in some other way, would be necessary.

12.2 Conclusions on why cars are used

The first issue that has been considered is the reasons why people use their cars for short trips. The main specific reasons identified by drivers were the carrying of heavy goods, usually, but not always, shopping, giving lifts particularly taking children to school, shortage of time, and because the car is needed for another trip. A lot of people used their cars for convenience and because of the distance involved. Sometimes the car would not have been used if the circumstances had been different, such as when it was used because of illness and bad weather. Relatively few examples of trivial reasons for using the car were found. The main reasons given by passengers were the length of the trip, the need to carry heavy goods, and convenience.

The main factor that seems to influence the use of the car for a short trip is the purpose of the trip. It largely explains the differences between males and females, differences between the young and the old and differences over the day. Those living in households with more than one car are more likely to use the car for reasons of convenience, whereas those with only one car are more likely to use it out of necessity. In urban areas the car tends to be used more because of time constraints and in order to give lifts to children, while in rural areas it is more for social activities and because of the distance to activities.

12.3 Conclusions on alternatives to the car

Alternatives to the car were identified for 78% of the car driver trips, leaving 22% for which no alternative could be identified despite extensive prompting by the interviewers. The main reasons for not identifying alternatives were an unwillingness or inability to do so, the need to take the elderly and ill and the need for a car at work. The types of trips which it seems would be most difficult to transfer away from the car are business and work trips, whilst the easiest would be taking children to school. It seems that it would be easier to transfer longer short trips away from the car then very short ones because in many cases the car is being used for the latter because it is essential whereas it is more likely to be used out of convenience for the longer trips.

Women appear to be more likely than men to reduce their use of the car, but this largely reflects the relative mixes of trip purposes. The young are more likely to reduce their use of the car than the elderly . This is partly because they are more willing to cycle and use the bus than their elders. It would be most difficult to reduce the number of short trips early in the morning, partly because of the nature of the trips, but also because of the lack of alternatives. It would be easier to reduce the number of short car trips in urban areas than in rural areas also because of the greater range of alternatives available.

According to the surveys, of all the short trips by car drivers, about 31% would transfer to walk, 31% would go by bus and 7% would cycle. About 4% might not travel at all if it was not possible to go by car. In about half of these cases the need that was met by the trip would be met by others. Quite a lot of the latter are escort trips, so the person being taken by car would travel by themselves using another means of travel or be taken by car someone already making the trip, such as a neighbour taking his or her own child to the same school.

The results are similar for car passengers. About 24% of car passengers were unable to identify any alternatives, which is slightly higher than the equivalent for car drivers. Of those who could switch, bus is the most popular, particularly for those going to work and the shops. This is followed by walking which appealed most to those on business and personal trips. Cycling was less popular as an alternative for passengers than for drivers. Taxis appealed more to passengers than drivers as an alternative, particularly with those on social trips and those for whom a car trip was being especially made. Those in this last category were amongst the ones least able to identify possible alternatives, along with those being taken because they felt unwell, those travelling with the elderly or ill, or those who needed to make a further trip.

Male car passengers were more likely to identify alternatives than females, and were more willing to walk and cycle. Elderly car passengers were much less able to identify possible alternatives than the equivalent drivers. This was also true of the younger passengers. Many of the young were prepared to consider walking, but very few identified cycling as an alternative. Bus is a popular alternative with all age groups.

In contrast to car drivers, for passengers it is the longest short trips (two to five miles long) for which there seem to be fewest alternatives, partly reflecting the fact that the only way some passengers could reach their desired destinations was to be taken by car.

12.4 Conclusions on policies and other actions to reduce car use

The single policy intervention that the respondents say would do most to attract them out of their cars is to improve bus services which could attract up to 21% of car drivers. In particular, increasing the route coverage and frequency of buses would make them much more attractive. More all-night buses would be very helpful. It is also important to improve the perception and knowledge of bus services by car drivers. The perception of the safety and security of children when travelling needs to be increased. This last factor might be assisted by the re-introduction of conductors on buses.

The respondents identified little in the way of specific policy intervention that could encourage more walking. However, improving safety, especially for children would help, as would introducing more local shops and other facilities. Better street lighting would also be useful. Many car drivers recognise that they need to take personal action to encourage themselves to walk, including improving their own organisation (and encouraging their children to get up earlier on school days). There is a case for more education and publicity on the benefits of walking to raise people's awareness of it as an alternative.

There is not very much evidence from the surveys of measures that would encourage more cycling, although improving facilities for cyclists would have some effect.

The variation in the effectiveness of the policy instruments across trip lengths is not large and reflects the suitability of the three alternative modes to take people on short trips of various lengths: walk the shortest and bus the longest. Improving walking facilities by making the streets safer, and providing more local facilities, could reduce the number of very short car trips (less than one mile long) by about 11%. There are not all that many of this type of trip.

A significant factor that deters many people from walking and cycling is bad weather. Whilst nothing can be done about improving it, it would be possible to make travelling by bus in bad weather more attractive by providing more bus shelters and a more reliable service.

Government, both central and local, has a role to play in the policy actions which could shift about 35% of the short car trips. As indicated above, the organizations that have most potential to encourage drivers out of their cars are bus companies. The legislation already exists to provide socially-necessary routes, but there will need to be funding to provide more routes and greater frequency. In the long run, with sufficient transfer of car trips to bus, such enhancements may become self-financing, but in the short run there needs to be an injection of cash. Reducing fares would do little to attract car users to buses.

Taxis could be used for some shopping and social trips but are perceived as expensive. There is no great advantage in encouraging taxi use if it simply means that a self-driven car trip is replaced by a taxi trip. But if some people gave up their cars because they felt able to use a taxi when none of the other alternatives was suitable, this could lead to a significant decrease in the number of short trips. Also, a taxi trip instead of a car trip may be potentially beneficial because car trips may involve searching for a parking space which may add to congestion. Substituting taxi trips for private car trips should reduce the demand for parking spaces. (Taxis driving around empty, looking for passengers, of course, add to unnecessary trips by car on the road).

There may well be a case for encouraging taxi-sharing as a way of reducing costs. Given the need to increase the route pattern and frequency of buses and the perceived high cost of taxis there seems to be scope for the introduction of demand-responsive services, based on large cars or minibuses

particularly for shopping and social trips. These could involve such vehicles operating between a fixed pair of points but with flexible routes so that passengers can be delivered to their doors to overcome the problems of carrying heavy goods and fears about personal safety, and helping to reduce the impact of bad weather.

Other bodies who have a role to play are retailers and employers. The former need to provide more local shops so that customers can walk or cycle more easily. The problem of carrying heavy goods can also be alleviated by the expansion of delivery services. These need to be organised rationally, so that several car trips are replaced by one van trip. Employers can help by providing showering and changing facilities for those who cycle or walk. They can also help by negotiating more convenient bus services with operators as part of their company travel plans.

Local government has a role to play by improving the facilities for cycling and walking, including better street lighting, and by increasing the provision of bus services by inviting operators to tender to provide significantly enhanced services. Central government's role is to provide leadership through funding, publicity and, where necessary, legislation.

12.5 Conclusions on the effects on traffic at a national scale

The survey results have been scaled up using factors from the NTS so that the effects on traffic at a national level could be estimated. The various actions identified in the surveys could reduce the total number of car trips by about 22% and the total distance travelled by about 5 or 6%. Actions which increase bus use could reduce the total number of car trips by about 14% and the distance travelled by about 4%. Actions which increase walking and cycling could reduce the number of car trips by about 3% and 1.5% respectively, and the distance travelled by car by about 0.3 to 0.4% each.

Overall, the actions and policies discussed here could make a significant difference to the number of car trips, and a smaller, but non-trivial difference to the total distance travelled by car. The key question is whether the actions that the respondents mentioned actually would make people transfer from their cars. The answer is, probably not without strong policies to reduce car use. What the results here show is that if such policies were introduced, there would be alternatives for the majority of short car trips, and that there would be a noticeable difference in the levels of traffic on the road.

12.6 Conclusions on the future behaviour of the respondents

Over half the respondents could see ways in which their trips could be made in ways that are more friendly to the environment, but only 17% said that they would consider making the same trip in a different way if they made it again next week. About a quarter of the respondents could identify ways of making the trip more enjoyable for themselves, but few could think of ways of improving it for passengers. The main finding that comes out of this analysis is that the young are much more able to see ways of making the trip in a way that is environmentally friendly, and are more willing to consider alternative ways of making the trip.

12.7 Recommendations

The following recommendations are made:

- Bus services should be improved in terms of route coverage, frequency and hours of service;

- Car drivers should be made more aware of bus services, both specific services and generally;
- The perception of the safety and security of children travelling unaccompanied should be increased, for example, by re-introducing bus conductors;
- Taxi-sharing should be encouraged;
- Demand-responsive public transport services should be introduced especially for shopping and social trips;
- Car drivers should be made more aware of the benefits of walking and cycling;
- Walking and cycle facilities should be improved, including better street lighting;
- Employers should be encouraged to provide showering and changing facilities for their employees who cycle and walk;
- The effects of bad weather should be ameliorated by installing more bus shelters and improving the reliability of bus services;
- Neighbourhood planning should be used to help develop more local shops and facilities;
- Delivery services from shops should be expanded in a way that ensures that one van trip replaces several car trips.
- Actions should be targeted where they are most likely to be effective:

  at those using cars to take children to school rather than those on work and business trips;

  at the young rather than the old;

  in urban areas rather than rural;

  at those with multiple car ownership (and therefore those with higher incomes);

  at those making rather longer short trips rather than those making very short trips;

  at young males for cycling initiatives.

Implementation of these recommendations will not, on their own, cause significant numbers of drivers to reduce their use of the car, but, linked with policies aimed at reducing car use, they do offer considerable scope for reducing car use for short trips. In particular, they indicate where action should be concentrated in order to maximize the impact of policies to reduce car use.

REFERENCES

Department of the Environment, Transport and the Regions (1999) National Travel Survey: 1996-98 Update, Transport Statistics Bulletin.

Mackett, R L and Robertson, S A (2000) Potential for mode transfer of short trips: review of existing data and literature sources, Report to the Department of the Environment, Transport and the Regions; obtainable via the world wide web at www.ucl.ac.uk/transport-studies/shtrp.htm.

Steer Davies Gleave (1999) Potential for the Mode Transfer of Short Trips: Survey Methodology: Final Report to the Department of the Environment, Transport and the Regions

APPENDIX A - THE DATA COLLECTED IN THE SURVEYS

A1 The travel survey

The following information was collected in the travel survey:

- Type of dwelling
- Type of household
- For each person in the household:
  - Name
  - Relationship to the person providing the general information
  - Sex
  - Date of birth
  - Economic status
  - Vehicle driving licence held for car, motor-cycle or heavy goods vehicle
  - Income
- For employed members of the household:
  - Number of jobs
  - Occupation in main job
  - Address of workplace for main job
- For those in education: address of school or educational institution
- For each registered motor vehicle in the household and each vehicle recorded in the travel diary:
  - Make of vehicle
  - Model of vehicle
  - Year of manufacture
  - Tax class of vehicle
  - Size of engine in cc
  - Ownership of the vehicle
- Number of bicycles in working order
- For each travel day:
  - Address of first trip departure
- For each stage of each trip made on a travel day:
  - Time of departure
  - Destination address
  - Time of arrival
  - Purpose of going there
  - Mode of transport used to go there
  - Distance travelled to go there
  - For car drivers:
    - Number of people in the vehicle
    - Type of parking at destination

A2 The in-depth interviews

At the in-depth interview the following information was collected for each short car trip:

- Whether there was anyone else in the car
- Whether the trip was for benefit of the respondent or for someone else
- For those who were making trips for other people:
  - Whether the other person was a member of the household;
  - Whether the person could have made the trip by themselves

For those who could not make it for themselves:
Why they could not
Whether there was an alternative to using the car for any parts of the trip:
After the initial answer the interviewer prompted for:
Walk or another mode
A different place
A different time or day, combined with another trip
Somebody else do it on behalf of the respondent
Some other way, such as delivery, phone call or staying at home
Whether the respondent could make the trip more environmentally friendly
Whether the respondent could see ways to make the trip more enjoyable or better in other ways for himself or herself
Whether the respondent could see ways to make the trip more enjoyable or better in other ways for his or her passengers
If the person was to make the same trip the following week, would they consider an alternative way of making it.

The interviewers carrying out the in-depth interviews were provided with coding sheets which they completed for each short car trip:
Whether there was a possible mode change mentioned
The alternative modes specified
Whether there could be a change of time and, if so, whether this could be linked with another trip
Whether there could be a change of day and, if so, whether this could be linked with another trip
Whether someone else could make the trip instead and, if so:
If this would avoid escorting a passenger
If this would be done as part of someone else's trip
Whether there would be a place change
Whether the trip could be made in some other way:
Delivery
Phone call
Working at home
Something else
Whether the respondent was a car passenger with no control over the trip
Whether the respondent was already car sharing
Whether the trip was for a car-related activity
Whether the trip was already linked as much as possible
Any other comments
If a significant external influence had to happen before a change could occur this was recorded and the nature of the consequential change recorded using the typology just described.

The data in the travel survey may be regarded as fairly standard travel diary information. Its main purpose was to identify the short car trips. It can also be linked with the in-depth data for the trips included there to provide information on factors such as trip purpose, age, sex and car ownership level. This means that the data on the alternatives can be cross-tabulated against such factors.

A3 Coding the data

The data from the travel survey and the in-depth survey were all coded by SDG. In the latter case this included the information on the coding sheet. It was found that this was of limited value because when a respondent had indicated more than one alternative it was not clear whether these were in combination or two separate alternatives. For example, if a respondent had said that they could switch to walk and could make a place change for a shopping trip it was ambiguous as to whether this meant they could walk to a nearer shop or whether they had the choice of two alternatives: walking to the same shops that they currently drove to, or driving to nearer shops. There were many examples like this. This made it impossible to calculate the number of alternatives to the car. That was essential to making a quantified estimate of the potential shift from cars to the alternatives. In addition there were further ambiguities in the coding because there were three alternatives adopted by the coders: Y for `yes', N for `no' and a blank. Whilst it was clear that a Y meant that the person would use the alternative and a blank meant that he or she would not, it was not always clear what N meant. There were comments added in many cases. Sometimes these implied that they would use the alternative under certain circumstances. However, it seemed rather illogical to count all the `no' answers as positive. An alternative approach was to regard the `yes' answers as definite possible alternatives and the `no' answers as less positive, and a`blank' as a definite `no'. However there were cases where a respondent gave a `yes' to one alternative and a `no' to another, but exactly the same comment was recorded.

Because of this ambiguity it was decided to recode the text that the interviewers had written down which formed the basis of the information put on the coding sheet. The information was coded under the following headings:

Why did they use their cars for the trip?
What were the alternatives to using the car?
What was the probability of adopting that alternative (high or low)?
What would have to happen to make the person adopt the alternative?

The information from the coding sheets was also drawn upon in producing answers to these questions.

People often gave several reasons why they used their car. For example, a person might say that they used their car because they needed to use it at work and because it was convenient. That is perfectly reasonable, but the reasons may not have the same weight. Of these two reasons, the first seems to be more important because it meant that the car had to be used for the trip under the present circumstances, whereas the use of the car because it is convenient is a much more general statement. Similarly, respondents often identified several alternatives. The actions required to make them transfer to the alternatives were also identified. Again there could be more than one of these associated with a particular alternative. This all makes the analysis complex, so much effort has gone into structuring the data in a way that makes it easy to interrogate but which retains the subtleties embedded within it.

The ways these issues have been addressed in this study are discussed in Appendix B.

APPENDIX B - THE ANALYSIS METHODOLOGY

B1 Introduction

In this appendix the methodology used to analyse the data will be described. The focus will be on the 1624 car driver and 263 car passenger trips covered in the in-depth interviews. The key point is that the data collected are essentially qualitative, describing how a number of households could reduce their numbers of short car trips. It would be possible to present the results in anecdotal form by identifying good examples of the various answers and citing them. However, that would give no indication of the magnitude of the responses, which is essential if useful policy advice is to be presented. It was not possible to collect quantitative answers because that would have required prior knowledge of the range of responses, such as the reasons why people used their cars, and that information was not available in a suitable form. Hence the analysis has required the development of a methodology that permitted the conversion of the text from 377 interviews into numbers.

B2 Classification of the data

The data on each trip were coded to four categories:
- The reasons why cars were used for the trip;
- The alternatives to using the car;
- The probability of adopting that alternative (high or low);
- The event that would have to happen to make the person adopt the alternative.

These data could all be associated with information from the travel survey. The following have been used:
- The purpose of the trip (work, business, shopping, escort to education, other escort, personal business, change mode, and home and education);
- The length of the trip (< 1 mile, 1-2 miles, 2-5 miles);
- The sex of the traveller;
- The age group of the traveller (17-29, 30-59, 60+);
- The number of cars owned by the household (0 or 1, 2, 3+);
- The time of day of travel (before 0700, 0700-0959, 1000-1559, 1600-1859, after 1859);
- The area of residence (London, Leeds, Ipswich, Hereford and Dorset).

The categories were defined in order to show interesting variations in the data, while including reasonable numbers in each category. For example, `education' has been included with `home' because only those aged 16 or over were being interviewed so there were very few education trips. `Home' has been included as a category rather than coding the trip purpose on such trips to the one on the previous trip as happens in NTS because this could lead to over-representation of trips which tend to be done later in multi-stage trips. `Change mode' covers examples such as driving to the railway station in order to catch a train.

B3 Classification of the reasons for using the car

The first stage was to code the data to the reasons. It was found that many respondents gave more than one reason. This is perfectly valid, but it was important not to give extra weighting to trips made by those able to give multiple responses. In order to avoid this the reasons were weighted by the inverse of the number of reasons given. For example if a person gave two answers each has been weighted by 0.5; if they gave three answers the weighting used was one-third, and so on.

Whilst this methods reduces bias towards trips by travellers giving multiple reasons, it does not overcome the problem that some reasons are more critical to car use than others. In order to address this issue, the reasons have been ranked according to how easy it is for a person using a car for this reason to find an alternative. This is based on the assumption that the fewer people who are able to identify an alternative, the more the use of the car is critical for those trips.

Some people were able to identify more than one alternative so, again it is important to avoid bias towards these trips, so they were weighted by the inverse of the number of alternatives in the same way as the reasons. The proportion of trips in each reason category for which there was no alternative was calculated. The reasons were ranked in descending order of the proportion not being able to identify alternatives (that is, the reason with the largest proportion of trips for which no alternative could be identified was at the top). Then if a respondent gave more than one reason, the reason with the highest ranking (that is the fewest alternatives associated with it) was classified as the main reason.

B4 Calculating the likelihoods of switching from the car

This information was used to calculate the likelihood of switching from cars. This can only be done in relative terms, because there is no compatible information available on how likely people are to give up their cars. However, if information about the number of car users willing to give up their cars is available from some other source, it will be possible to estimate which types of trip are more likely to switch. This has only been done for drivers because they are they are the key to reducing the number of cars on the road.

In order to form a basis for these calculations, the various reasons that the drivers are using their cars have been allocated a likelihood of switching from the car. The likelihoods range from `very low' for trips for which the respondent could not identify any alternatives, to `high' for trips for which all car drivers could identify one or more alternatives. The reasons have been allocated to the likelihood bands by grouping them according to the proportions of car drivers who stated that they had no alternative. The values obtained allowed this to be done in a reasonably unambiguous way. In order to combine the various likelihoods it was necessary to put weightings on them. In the absence of other information the simplest possible method has been used. This involves the allocation of a value of 1 to trips for which no alternatives were identified to 6 for those for which everyone could identify an alternative. It should be recognised that these values are arbitrary, but they do enable comparisons to be made. Different values which have the same sequence would make marginal differences, but would have to be very different to produce significant variations from the findings shown by these tables.

Weighted averages have been calculated and are labelled as the `score' for each category. In order to show the relative impacts the ratios of these to the overall average value have been calculated as the `score ratio'. The higher the value of the score and the score ratio the more likely that type of trip is to switch away from car use.

B5 Calculating the alternatives used

Then the alternatives were considered. It was indicated above that probabilities were coded with each alternative. In fact detailed examination revealed that the low probabilities were allocated to alternatives that were mentioned in order to be dismissed (for example `There aren't any buses and I wouldn't use them anyway'). It made little sense to include these, so only the alternatives which were identified positively were used. (These were used in the analysis above to establish the main reasons).

As indicated above, multiple alternatives were combined by weighting them by the reciprocal of the number given by the respondent.

The next stage in the analysis was to consider what actions would make users reduce their car use. The events that were coded were grouped into a smaller number of actions. The bodies responsible for implementing them have been identified. The impacts on the various actions on the various types of trip have been calculated.

B6 Calculating the impacts on national traffic levels

All the analysis so far has been in terms of the trips in the survey. It is possible to estimate the effects on all car trips in Great Britain. It must be recognised that interpreting the results from 377 interviews at a national scale implies some rather large assumptions. The respondents were selected at random from stratified samples in the five areas to represent different types of areas ranging from London to rurality, and so the results are representative.

The total number of trips and the total distance travelled per head by car drivers were obtained from the National Travel Survey. The total travel by all car drivers has been calculated by multiplying these figures by the population of Great Britain, 57.3 million. These figures are all approximations, but are sufficiently precise for the purpose of demonstrating at a national scale, the possible scale of the impacts identified in the survey. It should be noted that only car driver trips are considered here as the purpose of these calculations is to estimate the possible reduction in car traffic. Including car passenger trips would introduce an element of double counting. Car trips being made especially for car passengers are taken into account because they are `escort' trips.

The millions of short trips and millions of miles on short trips that could potentially be reduced have been calculated by applying the equivalent percentage reductions found in the survey to the national figures for short trips. The reductions in the distances were calculated by using the reductions in each of the three distance bands from the survey and applying this to the total distance travelled per head annually in those distance bands. These total reductions were then divided by the total number of trips and the total distance on all car trips to calculate the percentage reductions.