



# Appendices 1 to 8

Knowledge Review of the Social and  
Distributional Impacts of DfT Climate Change  
Policy Options



**Final Report to Department for Transport**

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## Appendix 1: Methodology

This appendix describes the approach that was taken to conduct the knowledge review. The methodology was broken down into six tasks, as follows:

- **Task 1:** Inception meeting
- **Task 2:** Collate evidence, and initial literature review
- **Task 3:** Secondary data analysis
- **Task 4:** Detailed literature review
- **Task 5:** Workshop
- **Task 6:** Final report

The tasks were undertaken in a broadly linear fashion, i.e. Task 2 followed on from Task 1, etc. The main exception to this was Task 3, which was effectively kept aside as contingency in order to be used to analyse data as and when it proved to be necessary. Hence, in practice, Task 3 was undertaken after the workshop (Task 5) in order to provide background information.

### Task 1: Inception meeting

The inception meeting was held with the DfT's desk officer and the project's Steering Group. The main aim of the meeting was to clarify the research questions and reach agreement on the specific social groups and transport policy measures that need to be researched.

### Task 2: Collate evidence and initial literature review

Task 2 consisted of three subsequent sub-tasks, as follows.

#### Task 2a – Identify and agree relevant evidence

The aim of Task 2a was to identify and bring together all the literature that might be of potential relevance to the project, so that this could be subject to an initial assessment. The aim at this stage was to be as comprehensive as possible in order to reduce the risk of relevant evidence being missed. The search for relevant evidence was done in a number of ways, for example:

- Collation of literature held by project partners.
- Electronic search of appropriate databases.
- Web search of grey literature.

The web search included the Science Direct and Google Scholar websites. These databases were interrogated using combinations of key words. A matrix showing the key words is attached in Appendix 2. In addition, the DfT, TfL and Defra websites were also consulted for relevant literature.

#### Task 2b – Initial review of literature

An initial sift was conducted on the collated literature using a Rapid Evidence Assessment (REA), which is a systematic method of searching for and critically appraising existing research. At this stage, the literature was assessed using a number of questions based on the project research questions and the results recorded in a pro-forma for each piece of evidence (a copy of the REA pro-forma is attached as Appendix 3). A total of 53 pro-formas were completed as part of this subtask (see Appendix 4 for a list of these documents and Appendix 9 for the assessments).

#### Task 2c – Final literature decision

Following Task 2b an internal meeting was held to decide which literature should be assessed in more detail in Task 4. Someone from each organisation reviewed all of the completed pro-formas and made an initial decision as to whether the piece of evidence should be reviewed in more detail in the next stage of the project. The relevant decisions were discussed at the meeting and where opinions differed these were then discussed with the result that all of the evidence that was to be reviewed in more detail had been agreed by the team as a whole. These decisions were also made to ensure that the evidence to be reviewed in more detail covered a good spread of all the groups and policies

investigated. A total of 42 papers were passed on to Task 4 for the more detailed review (see Appendix 4 for a list of these documents and Appendix 10 for the detailed reviews).

### Task 3: Secondary statistical analysis

Having undertaken Tasks 2 and 4, it was realised that it was necessary to review existing data sources to identify existing inequalities in terms of transport access and use, i.e. to identify existing SDIs. The issues investigated and data sources reviewed were as follows:

- **Review of the current transport situation: travel behaviours of different social groups.** This was investigated by reviewing the latest *National Travel Survey bulletin* (DfT, 2009a) and the latest *Family Spending report* (ONS, 2007) in order to identify trends in travel behaviours of different social groups, e.g. by gender, age, income group and ethnic group.
- **Increased understanding of attitudes to transport and climate change.** The latest reports on the *National Statistics Omnibus Survey* (2006 and 2007) were reviewed to identify public attitudes towards climate change and the impact of transport. Chapter 7 of the latest report of the *British Social Attitudes Survey* (2007) was also reviewed, as this relates to attitudes to car use and climate change.
- **Increased understanding of vehicle ownership.** Review the latest 'Private Motorists Survey' (2006), produced by DVLA. The aim is to identify trends in vehicle ownership and views of the environment.

### Task 4: Detailed analysis

The aim of this task was to provide a summary of each research paper, answering the project research questions. Broadly, the responsibilities for reviewing the respective evidence were split between the partners, as follows:

- **AEA** led on literature which considered impacts of and attitudes to technological measures.
- **TTR** led on literature which considered impacts of and attitudes to pricing measures.
- **Karen Lucas** led on literature which considered impacts of and attitudes to behavioural change measures.

A template was designed based on the project research questions. The idea was to provide a more in-depth summary of the research paper, which could be drawn upon for the final report. A copy of the detailed analysis template is attached in Appendix 5, while the individual summaries of the reports reviewed are located in Appendix 6.

### Task 5: Project team workshop

A one day project team workshop was held in November 2009 to review the extent to which the evidence answered the research questions, to identify any omissions from work that had been undertaken thus far, e.g. in terms of missed evidence, and to review the emerging research gaps. The workshop was attended by most of the project team, as well as two external peer reviewers<sup>2</sup>. The aim of having the peer reviewers at the workshop was to enable them to bring their respective relevant expertise to the project and to enable them to cast an independent eye on the research conducted so far.

### Task 6: Reporting and Final presentation

An early version of the draft final report was shared with the DfT's desk officer and the peer reviewers. This was revised on the basis of the comments received. An Executive Summary was then drafted and shared with the DfT's desk officer. This was subsequently revised in light of the comments received and circulated to the Steering Group prior to the final meeting in February 2010. The draft final report was then amended to take on board the comments received at the final meeting with the Steering Group. This version was then passed to the DfT's desk officer and Steering Group for comment. The General Election of May 2010 delayed the finalisation of the report. The report was

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<sup>2</sup> These were Graham Parkhurst of UWE and Noel Smith (Loughborough University).

amended towards the end of 2010 to reflect the changed policy framework (although no further evidence was reviewed) and was subject to a further round of comments from the DfT before being finalised in June 2011.

## Appendix 2: Key words used in the internet search

<b>Words used</b>	<b>Combined with</b>
Transport policy	Social Exclusion
Climate Change policies	Distributional impacts
Road user charging	Social impacts
Cycling	Equity
Walking	Vulnerable groups
Public Transport	Low income groups
Smarter choices	Disabled groups
Alternative fuels	Young people
Electric vehicles	Elderly people
Smart ticketing	Rural areas

### Appendix 3: Rapid Evidence Assessment Pro- Forma

PART A – BASIC INFORMATION		
<b>Author(s)</b>		<b>Year of publication</b>
<b>Title/publication</b>		
<b>Context</b>	<i>Type of publication e.g. journal article, other article, book, book chapter, working paper, report, conference paper, response to government consultation</i>	
	<i>Type of study e.g. literature review, survey</i>	
	<i>Geographic – country, region, city</i>	
	<i>Sample size (if relevant)</i>	
PART B – FOCUS		
<b>1. Different social groups</b>	<i>a. Does the document tell us anything about the reaction of different social groups to transport policy measures (which groups are covered)?</i>	
	<i>b. Does the document tell us anything about travel problems experienced by the different social groups? If so, does it also tell us how transport policy measures might impact on them?</i>	
<b>2. Different transport policy measures</b>	<i>a. Does the document tell us anything about different transport policy measures (which measures are covered)?</i>	
	<i>b. Does the document tell us about the impact of different transport policy measures on behaviour?</i>	
	<i>c. Does the document tell us about the impact of different transport policy measures on attitudes, including acceptability?</i>	
	<i>d. Does the document tell us about the distributional effects of different transport policy measures?</i>	
	<i>e. Does the document tell us about the impact of different transport policy measures on CO<sub>2</sub> emissions of different social groups?</i>	
PART C – ROBUSTNESS		
<b>To what extent is the document evidence based e.g. is it based on empirical research, best practice or informed opinion; comment on any limitations acknowledged by authors; if research based, how representative is sample, are results interim?</b>		
<b>Method of publication review (please specify if known)</b>		

## Appendix 4: List of papers and documents reviewed in the project

Report	Reviewed Stage 1	Reviewed Stage 2
Travel information as an instrument to change car drivers travel choices: a literature review - Chorus, CG, Molin, EJE and van Wee, B,	Yes	No
Comparisons of Cycle Use for the Journey to Work from the '81, '91 and 2001 Censuses - Parkin, J.	Yes	No
Distributional effects of alternative vehicle pollution control policies - Sarah E. West	Yes	Yes
Symbolism in California's Early Market for Hybrid Electric Vehicles - Heffner R.R., Kurani K.S. Turrentine T.S	Yes	Yes
The Treatment of Social and Distributional Impacts in Appraisal Evaluation – Final Report - Parkhurst, G., and Shergold, I	Yes	Yes
Analysing awareness and Acceptability of Hydrogen Vehicles: A London Case Study - O' Garra T. , Mourato S. Pearson P.	Yes	Yes
Equity analysis of personal tradable carbon permits for the road transport sector – Zia Wadud, Robert B. Noland and Daniel J. Graham	Yes	Yes
Evaluating Transportation Equity Guidance For Incorporating Distributional Impacts in Transportation Planning - T Litman	Yes	No
Evaluating Transportation Affordability – Litman, T	Yes	Yes
Cycling on the Journey to Work: Analysis of Socioeconomic Variables from the UK 1991 Population Census Samples of Anonymised Records - Gardiner C. & Hill R.	Yes	Yes
Tackling Social Inclusion through New Technologies – ODPM	Yes	Yes
How can we reduce carbon emissions from transport? Bristow, Pridmore, Tight, May, Berkhout and Harris	Yes	Yes
Critical Issues in Decarbonising Transport:- Skinner I, Fergusson, Kroeger K., Kelly C., Bristow A,	Yes	Yes
Mapping the life cycle, environment impacts, interventions and tradeoffs for cars - TRL	Yes	
Exploring potential inequities between the burdens and benefits of climate change abatement policies in the transportation sector - Aaron Golub and Jason Kelly	Yes	Yes
Transport Emissions Profiles - Anable J., Boardman B. And Root A.	Yes	Yes
Low Income Motoring in the UK - Bayliss D. For the RAC Foundation	Yes	Yes
Personal Carbon trading and Climate Change – Christian brand	Yes	Yes
Transport policy and health inequalities: a health impact assessment of Edinburgh's transport policy - D. Gorman et al.	Yes	Yes
Low-carbon communities as a context for individual behavioural change - Heiskanen E	Yes	Yes
Exploring public attitudes to climate change and travel choices: deliberative research- Suzanne King, Mark Dyball, Tara Webster, Angela Sharpe, Alan Worley, Jennifer DeWitt	Yes	Yes
Understanding the travel needs, behaviour and aspirations of people in later life- Tim Knight, Josie Dixon, Martha Warrener and Stephen Webster	Yes	No
Evaluating Mobility Management Strategies for Reducing Transportation Emissions in the Fraser River Basin - Litman T.	Yes	No
Evaluating Transportation Equity: Guidance For Incorporating Distributional Impacts in Transportation Planning- Litman T.	Yes	Yes
Transport, the environment and social exclusion- Lucas, K, Grosvenor, T, Simpson, R,	Yes	No



The Car in British Society- Lucas and Jones	Yes	Yes
Travel Behaviour, Experiences and Aspirations of Disabled People - Penfold et al	Yes	Yes
Evidence Base Review on Mobility - Choices and Barriers for Different Social Groups – Smith et al.	Yes	Yes
The Travel Choices and Needs of Low Income Households: the Role of the Car – Taylor et al	Yes	Yes
Understanding the Travel Aspirations, Needs and Behaviour of Young Adults -Taylor et al	Yes	Yes
Concessionary Bus Fares for Older People in Scotland - Are They Achieving their Objectives? - Tom Rye, William Mykura	Yes	Yes
A Sourcebook in Good Practice in Freight Transport - EC	Yes	No
Assessing Social and Distributional Impacts in Transport Scheme Appraisal and Evaluation – Atkins for DfT	Yes	Yes
Cycling Personal Travel Factsheet - DfT	Yes	Yes
Delivering a Sustainable Transport System - DfT	Yes	No
Good Practice Guidelines – Delivering Travel Plans through the Planning Process - DfT	Yes	No
Smarter Choices – Changing the way we Travel - DfT (Sally Cairns, Lynn Sloman, Carey Newson, Jillian Anable, Alistair Kirkbride and Phil Goodwin)	Yes	No
Review of public attitudes to climate change and transport, DfT report – Jillian Anable	Yes	Yes
VELO.INFO: the European Network for Cycling Expertise - European (5 <sup>th</sup> RTD Framework Programme)	Yes	No
BYPAD (Bicycle Policy Audit) - European (5 <sup>th</sup> RTD Framework Programme)	Yes	No
The Role of national cycle network traffic-free paths in creating a cycling culture; The case of NCN route 5 Stafford- Dr Tim Jones	Yes	Yes
Developing guidance and advice to address the social and distributional impacts of road pricing - Parkhurst G	Yes	Yes
Transport Assessment Guidance (TAG) Unit (3.12.4), Measuring the Social and Distributional Impacts of Road Pricing Schemes – DfT	Yes	Yes
Central London Congestion Charging: Impacts Monitoring – TfL	Yes	Yes
CURACAO: State of the Art Review, Ch.10: Equity - Barham, P, and May, A (University of Leeds)	Yes	Yes
Equity Effects of Road Pricing: A Review - David Levinson	Yes	Yes
Road user charging and social exclusion: The impact of congestion charges on at-risk groups - Peter Bonsall and Charlotte Kelly	Yes	Yes
Forecasting environmental equity: Air quality responses to road user charging in Leeds, UK - Gordon Mitchell	Yes	Yes
The impact of transport on social exclusion processes with specific emphasis on road user charging - Fiona Raje´	Yes	Yes
Equity and Accessibility - Stantchev, D, Menaz, B	Yes	Yes
Better Access and Mobility- Beacon Council Research Report (ODPM)	Yes	No
Hypermobility: too much of a good thing (PIU Transport Seminar) - Professor John Adams	Yes	No

## Appendix 5: Template used in the detailed analysis

<b>Author(s)</b>		<b>Year of publication</b>	
<b>Title/publication</b>			
<b>Context</b>			
	<i>Type of study e.g. literature review, survey</i>		
	<i>Geographic – country, region, city</i>		
	<i>Sample size (if relevant)</i>		

1. What climate change policies are we concerned with?
  
2. What are the potential key social impacts of different climate change policy options?
  - a) For each key potential social impact (bearing in mind Atkins' definition), we need to identify the policies that potentially have the (positive or negative) impact. Where impact is dependent on other factors (e.g. scope or stringency of policy, way in which investment is undertaken), these need to be identified clearly.
  - b) Can any disproportionately negative affects be mitigated or positive ones be further maximized? If so, how?
  
3. How will these impacts (positive or negative) differ between different social groups (distributional impacts)?
  - c) Are there any disadvantaged groups or areas that may be particularly negatively or positively affected? If so, how?
  - d) Can any disproportionately negative affects be mitigated or positive ones be further maximized? If so, how?
  - e) To what extent is the impact dependent on the area in which the different social group live?
  
4. What key groups and /or geographical areas will be most affected (positively or negatively) by these different social impacts?
  - a) What is the likely impact of the policy measures that we have considered on people's travel behaviors?
  - b) Who and where will be most affected by these and how?
  
5. How are public attitudes (including acceptability) likely to differ between social groups for both mandatory and voluntary options? How will take-up (and the barriers to take-up) of voluntary measures differ between groups?
  
6. What will impact (in qualitative terms in absence of quantitative data) of policy options be on the i) transport behaviours, and ii) CO2 emissions, of different groups?
  
7. What remaining gaps exist in the evidence base and how could these be filled?

## Appendix 6: Summary of the potential average social impacts of climate change policies by category of policy instrument

Key: Positive Negative

Potential Impact	Category of policy instrument	Alternative fuels		More fuel efficient vehicles		More fuel efficient driving behaviour		Improving vehicle utilisation		Changing modes		Reducing trips	
		User	Non-user	User	Non-user	User	Non-user	User	Non-user	User	Non-user	'User'	Non-user
Climate Change	Direct												
	Indirect	0	0	0	0	0	0	0	0	0	0	0	0
Risk of accidents	Direct					1	1			3		4	
	Indirect				5				2		2		2
Security	Direct									3		4	
	Indirect											6*	
Physical fitness	Direct									3		3	
	Indirect												
Local air quality	Direct												
	Indirect	7	8	9	9	9	9	9	9	9	9	9	9
Terrorism	Direct												
	Indirect	10		11		11		11		11		11	
Noise	Direct					12	12	13	13	13	13	13	13
	Indirect			5	5								
Biodiversity	Direct												
	Indirect		14										
Water environment	Direct												
	Indirect		14		14								
Landscape	Direct							13		13		13	
	Indirect		14		14								
Heritage	Direct							13		13		13	
	Indirect												
Journey ambience	Direct									3		4	
	Indirect												
Option values	Direct												
	Indirect												
Transport	Direct												

Potential Impact	Category of policy instrument	Alternative fuels		More fuel efficient vehicles		More fuel efficient driving behaviour		Improving vehicle utilisation		Changing modes		Reducing trips	
		User	Non-user	User	Non-user	User	Non-user	User	Non-user	User	Non-user	'User'	Non-user
<b>interchange</b>	Indirect												
<b>Townscape</b>	Direct								13		13		13
	Indirect												
<b>Severance</b>	Direct				17		17		13		13		13
	Indirect		16		16								
<b>Reduced journey times</b>	Direct												
	Indirect							13*		13*		13*	
<b>Access to transport system</b>	Direct			18		18		18		18			
	Indirect	15		15									
<b>Regeneration</b>	Direct												
	Indirect												
<b>Regional imbalance</b>	Direct												
	Indirect												
<b>Affordability</b>	Direct			11		11		11		3		11	
	Indirect	15		15									
<b>Reliability</b>	Direct												
	Indirect							13		13		13	
<b>Connectivity</b>	Direct											4	
	Indirect												
<b>Housing - Land use policy</b>	Direct												
	Indirect												
<b>Resilience</b>	Direct												
	Indirect												
<b>Wider economic impacts</b>	Direct												
	Indirect												

Notes referred to in the table:

\* indicates impacts on remaining transport users, i.e. those who do not change their behaviour as a result of the implementation of the policy

0 – As aim of policy is to reduce CO<sub>2</sub> emissions

1 – Assuming that the risk associated with more fuel efficient driving is less than average

2 – Assuming that fewer trips increase traffic speeds

3 – Depends on whether the mode that is now being used is on average better or worse with respect to the relevant attribute than the mode that was previously being used

4 – As fewer trips undertaken

5 – As some alternatively fuelled vehicles are quieter than conventional vehicles

6 – If a mode is less well used, it could be less secure for those who continue to use it

7 – Depends on whether alternative fuel is cleaner when used in engines or not

8 – Depends on impacts of production and transport, etc

9 – As less fuel used, so fewer emissions of local air pollutants

10 – As increases the diversity of supply

11 – As less fuel used

12 – Assuming that the driving patterns associated with more fuel efficient driving is quieter

13 – As fewer vehicles in use

14 – Depending on relative impacts of growing biofuels/using alternative energy carriers compared to extracting/refining other fuels/manufacturing conventional vehicles

15 – If cost of travel, either fuel, tickets or vehicle purchase, increases

16 – If cost of travel increases, thus potentially reducing traffic levels

17 – If cost of travel decreases, thus potentially increasing traffic levels

18 – If cost of travel decreases

### Appendix 7: Potential social impacts by most affected social groups and areas

Social impacts	Most affected social groups and areas											
	Children 0-16 yrs	Young people (16-25 yrs)	Older people (65+)	Low income households	No car households	Parents	Women	Black & Minority Ethnic Groups	Disabled people	Long distance commuters	Rural areas	Deprived peripheral estates
Noise	More likely to be susceptible		More likely to be susceptible	More likely to live near busy roads	More likely to be exposed due to more walking trips			More likely to live near busy roads	People with mental ill-health are more likely to be susceptible		Least likely to be exposed to traffic related pollution	More likely to be located near busy roads
Air quality	More susceptible to traffic related asthma		More susceptible to traffic related chronic lung diseases	More likely to live near busy roads	More likely to be exposed due to more walking trips	Most worried about local air quality		More likely to live near busy roads	People with mental ill-health are more likely to be susceptible	Highest levels of exposure to traffic pollution is in-car	Least likely to be exposed to traffic related pollution	More likely to be located near busy roads
Mitigation of climate change		Least likely to be included o behaviour change programmes	Older people are driving into older age but older women are least likely to drive and so not impacted by car reduction measures	Increasing number of low income households now own cars and use them for most trips	Are not directly impacted by car reduction measures but can reduce lift shares	Car escort trips likely to be adversely affected by car reduction measures	More likely to be negatively impacted by car reduction measures	Some BME groups more likely to be negatively impacted by car reduction measures	Are least likely to drive and so not impacted by car reduction measures	More likely to be negatively impacted by car reduction measures	More likely to be negatively impacted by car reduction measures	Least likely to be included o behaviour change programmes
Access to key services	Adult dependent	Particularly 16-18 yrs NEETs experience access problems	Access to healthcare is often a problem for this group	53% do not own cars and most likely to experience difficulties	Non-car ownership largely based on income... Most likely to experience difficulties		More demand on women (especially lone parents) to access multiple destinations	Some groups find it difficult to access religious and cultural centres	Some groups find it difficult to access specialist services e.g. deaf centres		Often need to travel further to access services	Local services (especially GPs and shops) often in decline in these areas which reduces access for residents

Social impacts	Most affected social groups and areas											
	Children 0-16 yrs	Young people (16-25 yrs)	Older people (65+)	Low income households	No car households	Parents	Women	Black & Minority Ethnic Groups	Disabled people	Long distance commuters	Rural areas	Deprived peripheral estates
Severance	More likely to be affected in terms of play facilities		More likely to be afraid to cross a busy road	More likely to live near busy roads	More likely to be exposed due to more walking trips			More likely to live near busy roads	People with mobility problems and mental ill-health are more likely to find it difficult to cross a busy road	Often benefit from improved journey times	Rural roads can often be a barrier to walking and cycling in rural areas	More likely to be located near busy roads
Affordability	Children often travel free on buses.	One of the key concerns of young people as identified by Youth Parliament	Concessionary fares scheme means free travel after 9.00am	Cost of car ownership and use and of public transport fares is of great concern	Cost of public transport fares is of great concern	Often cited as a reason why parents drive children to destinations  Cost of full public transport fares for morning school trip is a concern for low income lone parents	Cost of full public transport fares for morning school trip is a concern for low income lone parents	Can be an issue for low income BMEs	Concessionary fares scheme means free travel after 9.00am	Cost of petrol is an important issue	Cost of petrol is an important issue	Higher car insurance can be an issue
Journey times savings	Not relevant to this group	Not relevant to this group	Not relevant to this group	Can be relevant for low paid workers	Relevant in terms of reduced bus journey times	Often cited as a reason why parents drive children to destinations	Time poverty often makes this important for women with multiple household responsibilities		Long journeys can be difficult for people with mental ill-health	Very important to this group	Often important to this group	

Social impacts	Most affected social groups and areas											
	Children 0-16 yrs	Young people (16-25 yrs)	Older people (65+)	Low income households	No car households	Parents	Women	Black & Minority Ethnic Groups	Disabled people	Long distance commuters	Rural areas	Deprived peripheral estates
Personal safety (crime and fear of crime)							Often cited as a reason why parents drive children to destinations					
Safety (pedestrian accidents)	More likely to be susceptible	14-16 year olds in SEG V are most likely to be involved in pedestrian accidents	Often cite fear of busy roads as a reason for not leaving the house	More likely to be located near busy roads and so be exposed to accidents	More likely to be exposed due to more walking trips	Is often cited as the reason for not allowing children to walk or cycle		Some evidence to suggest that children in BME families are more likely to be involved in pedestrian accidents		Least likely to be exposed to pedestrian accidents	Pedestrian accidents highest on busy rural main trunk and A roads	More likely to be located near busy roads and so be exposed to accidents
Health	Reduced active travel and obesity rates increasing most rapidly in this group	Obesity rates increasing rapidly in this group		Obesity rates higher within lowest income groups	More likely to walk and cycle but this can cause stress (see Bostock, 1999)			Some BME groups more susceptible to obesity and more resistant to active travel				



### Appendix 8: Summary of the key impacts of climate change policies on different social groups

Climate change policy impacts	Most affected social groups and areas											
	<i>Children 0-16 yrs</i>	<i>Young people (16-25 yrs)</i>	<i>Older people (65+)</i>	<i>Low income households</i>	<i>No car households</i>	<i>Parents</i>	<i>Women</i>	<i>Black &amp; Minority Ethnic Groups</i>	<i>Disabled people</i>	<i>Long distance commuters</i>	<i>Rural areas</i>	<i>Deprived peripheral estates</i>
Alternative fuels (bio-fuel)											There may be some negative impacts on rural economies from bio-fuel production	
More fuel efficient vehicles				Could potentially benefit low income motorists in terms of financial savings								
Hybrid and new electric vehicles			Older people are less likely to adopt new technologies	Low income groups least likely to take up new technologies			Women less likely to adopt new technologies			May be unable to charge vehicles	May lack infrastructure for vehicle charging	May lack infrastructure for vehicle charging
More fuel efficient driving				Could potentially benefit low income motorists in terms of financial savings						Could potentially benefit the most in terms of financial savings		
Increasing vehicle utilisation		Young drivers often excluded from car clubs and sharing		People in low income areas often reluctant to car share due to trust & personal safety			Women often reluctant to car share due to personal safety				More difficult to establish car clubs and car-sharing networks in rural areas	More difficult to establish car clubs on deprived estates – insurance issues

		schemes		concerns		concerns						
<b>Climate change policy impacts</b>	<b>Most affected social groups and areas</b>											
	<i>Children 0-16 yrs</i>	<i>Young people (16-25 yrs)</i>	<i>Older people (65+)</i>	<i>Low income households</i>	<i>No car households</i>	<i>Parents</i>	<i>Women</i>	<i>Black &amp; Minority Ethnic Groups</i>	<i>Disabled people</i>	<i>Long distance commuters</i>	<i>Rural areas</i>	<i>Deprived peripheral estates</i>
Changing mode (public transport)		Younger people are a captive market for public transport but often do not benefit from improvements due to commuter routing	Older people are a captive market for public transport but often do not benefit from public transport improvements due to commuter routing	Can benefit from public transport improvements only if targeted at the areas where they live	Often do not benefit from public transport improvements due to centre periphery routing and scheduling	Least likely to change mode to public transport due to the need for multi-destination trips	Women drivers area least likely to change mode due to the need for multi-destination trips. More women use public transport than men	Some groups may not use public transport for cultural reasons e.g. Muslim women	Often do not benefit from public transport improvements due to overcrowding on existing routes e.g. London Congestion Charge	Could potential benefit from major new routes	Rarely benefit from public transport improvements due to routing	Often do not benefit from public transport improvements due to routing
Changing mode (cycling and walking)	Some health benefits noted from walking and cycling to school projects	Cycling is popular with this age group	Older people tend not to cycle	Less likely to be targeted by smarter choices initiatives. Issues with bike storage and theft	Cycle less than the average population and can be resistant to this as a transport option	Often do not use these modes due to escort nature of trip	Women less open to cycling options than men	BME groups are less likely to cycle	People with physical disabilities tend not to cycle	Will not to benefit from cycle and walking projects due to journey distances	Tend not to benefit from cycle and walking projects due to journey distances	Few smarter choices treatments target these areas due to low levels of car ownership
Reducing trips (road pricing)	Often it is after school and leisure activities with the family that parents say they will forgo	Often it is after school and leisure activities with the family that parents say they will forgo	Often rely on lifts which can be withdrawn in increased price scenarios	Already have low number of trips and journey distances. Further reductions can cause social exclusion	Often rely on lifts which can be withdrawn in increased price scenarios	Parents have reported a sense of relief that they have an excuse not to 'taxi' children around			Often rely on lifts which can be withdrawn in increased price scenarios	Low income motorists with long distance journeys are likely to be hardest hit by increased costs	Low income rural motorists noted as among most vulnerable to pricing initiatives	



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