Local Sustainable Transport Fund Evaluation: A Case Study Evaluation of Carbon Impacts and Congestion Relief

Appendices to the Executive Report

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Alan Wong, John Preston, Adrian Hickford and Karen Ghali
with contributions from
Paul Kevill, John Rider, Tim Ryley and Lynn Stinson

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Appendix 1: Study Design

The Local Sustainable Transport Fund (LSTF) Case Study on Carbon Impacts and Congestion Relief uses a mixed methods analysis approach that is predominantly quantitative but also contains some associated qualitative aspects. The main component is a large scale 'before' and 'after' self-completion postal cohort survey, which is supplemented by secondary data captured independently from other sources. This has been accompanied by more qualitative information gained through focus groups among those who had participated in the surveys.

The before and after surveys formed the primary data collection, which compared the travel behaviour and associated views of individuals drawn at random from the electoral register in the treatment areas against those from similar control areas. The survey tool and administrative procedure applied was based on the approach developed by the iConnect project (Ogilvie et al., 2011), which investigated the links between physical interventions (which also principally formed the primary LSTF-measures analysed in this Case Study), and behavioural change. An initial pilot was conducted in Woolston (Southampton) in early November 2013, to validate the choice of survey method and instrument design. The before surveys were then despatched in late 2013, with follow-up reminders sent to non-respondents in spring 2014. The after survey repeated these timings in late 2014 and spring 2015, to those who had responded to the before survey.

The primary data collection was supplemented by the collation of secondary travel data, particularly with respect to local traffic volumes and journey times, and further data relating to the impact of secondary interventions. These secondary interventions typically encompassed 'smarter choices' or softer measures, such as personalised journey planning, workplace travel planning and school travel plans (see Table A1.1), which had also been applied to the treatment areas. The primary data was also supplemented by qualitative analysis of feedback from focus groups conducted in the treatment areas over the summer of 2014, and repeated in summer 2015, to reflect the views of the before and after surveys respectively. The aim was to enrich and provide further context to the quantitative analysis, as it was recognised that primary data alone would not capture all the nuances of the impacts of LSTF interventions on individual travel decisions. It should also be noted that the survey tool used (see Annex A) included data on respondents' attitudes and perceptions towards sustainable travel, and their awareness of the LSTF-related interventions, as well as a recorded seven-day travel diary. Our overall study design was thus influenced by the multi-methods approach advocated by, for example, Hoggart et al. (2002).

In this Appendix, we give more details of the approach adopted, starting with details of the case study areas (A1.1), including the primary and secondary LSTF travel inventions which have been applied, as well as the control areas used for comparison. This is followed by further information on the evaluation methodology (A1.2), details of the initial primary data collected to support it (A1.3), the data cleansing process used (A1.4), the weightings applied to the before sample (A1.5) and the approach and details of the after survey (A1.6).

The rest of these Appendices then detail the travel behaviour results from the primary data analysis performed (Appendix 2), including changes in mode splits and the differences between treatment and control areas, as well as year-on-year difference-in-differences comparisons, and a further dosage analysis. This is followed by market segmentation of the survey participants (Appendix 3), including their

car ownership, income and occupation. Respondents were grouped into nine categories as identified by Thornton et al. (2011), to determine which segments were the most likely to change their sustainable travel behaviour. The next Appendix (4) then presents findings from the (primary) attitudinal and awareness data analysis, and assesses whether there were any (both perceived and actual reported) travel behaviour differences year-on-year between those who became aware of the local LSTF-schemes and those who did not.

Where travel changes were identified, the year-on-year impact on carbon emissions was estimated (Appendix 5). The collection and analysis of the secondary data and interventions is then described (Appendix 6), and finally, the qualitative focus group methodology and findings are detailed (Appendix 7).

A1.1 Details of Case Study Areas

Our work is based on three groups of case studies, based on LSTF initiatives in South Hampshire, Greater Manchester and Leicestershire. The temporal scope of the case studies is the duration of the LSTF programmes (2012/13 to 2014/15[1]). From these broad areas, we have developed a purposive sample of sub-areas, with high concentrations of LSTF interventions and hence potential for modal shift, congestion relief and carbon impacts. The sampling has been focused on areas/interventions where the appraisal has indicated that there will be particularly high benefits in relation to carbon and congestion. We have also identified three control areas with similar geo-demographics to the intervention sites.

The first case study is the South Hampshire Sub-Region, as shown in Figure A1.1, which is the locus for three LSTF projects (Transport for South Hampshire (TfSH)[2], Southampton City Council (SCC) and Portsmouth City Council (PCC)). The focus is on the Transport for South Hampshire large LSTF scheme.

[1] Subsequently extended to 2015/16 for Greater Manchester and Leicestershire.
[2] Now Solent Transport.

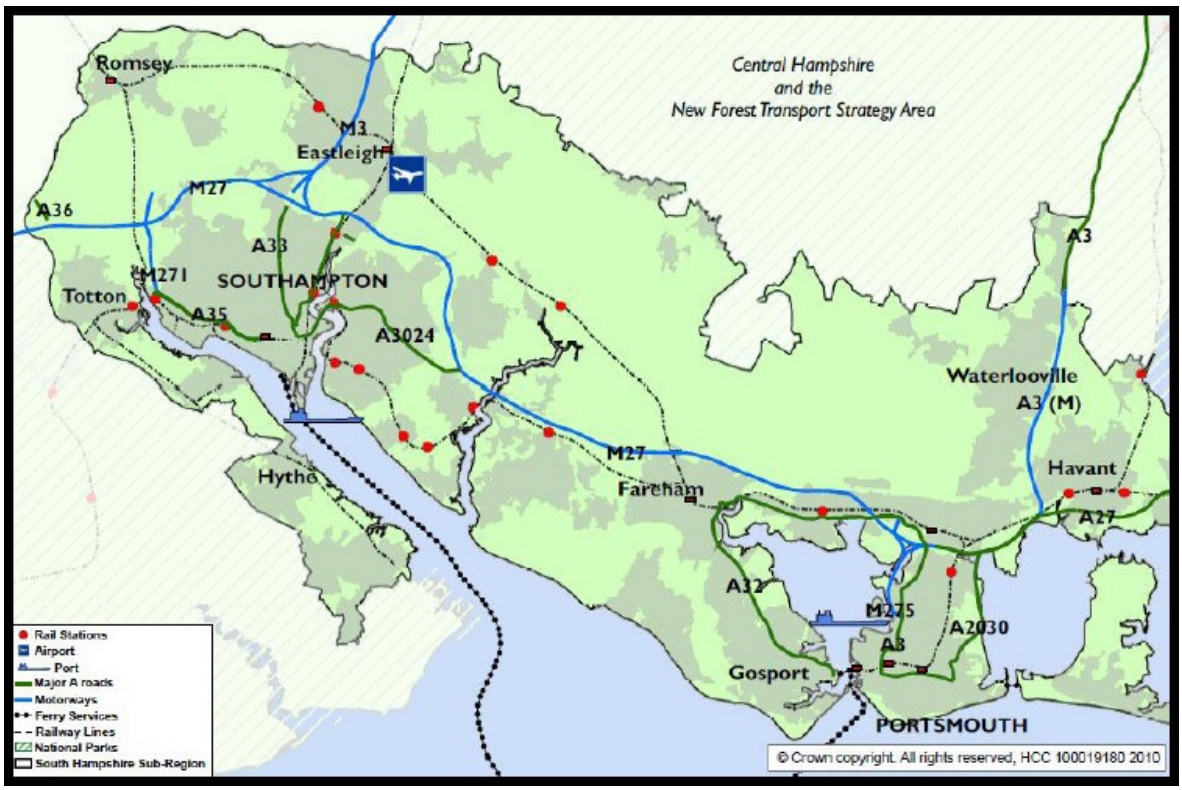


Figure A1.1: Main transport networks of the South Hampshire Sub-Region.
Source: Transport for South Hampshire (2011) DfT LSTF Bid – 'A Better Connected South Hampshire', p.8

The South Hampshire LSTF focuses on nine corridors, of which we have sampled Gosport to Fareham in the east of the sub-region, and Southampton to Eastleigh/Chandler's Ford in the west of the sub-region (see Figure A1.2). It is proposed that the Locks Heath area (west Fareham) is used as a control area, as it is located between the Southampton and Portsmouth based interventions.

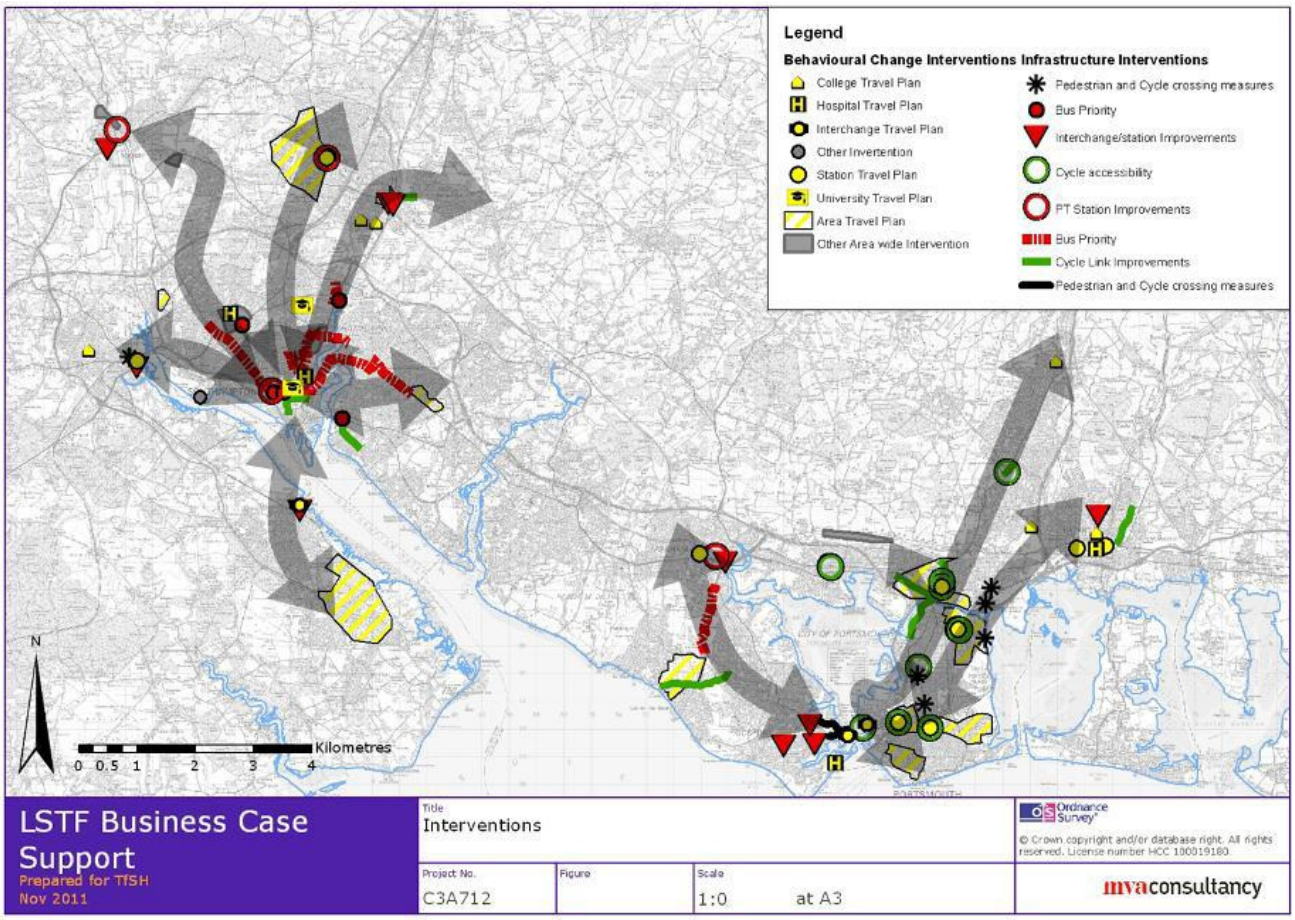


Figure A1.2: Targeted corridors in South Hampshire with proposed interventions superimposed

The second case study is focused on Greater Manchester. The Greater Manchester LSTF includes a key component project based on the development of a commuter cycle network (Tranche 1 Small Bid) plus four projects focused on sustainable access to key destinations and transport hubs, supporting sustainable travel choices, smarter travel and enabling community transport ('Let's Get to Work' Large Bid). Two intervention areas have been identified: Hyde/Hattersley (Tameside) and Rochdale/Kingsway Business Park, whilst Wigan has been chosen as a control area. The two intervention areas are illustrated by Figures A1.3 and A1.4 below.

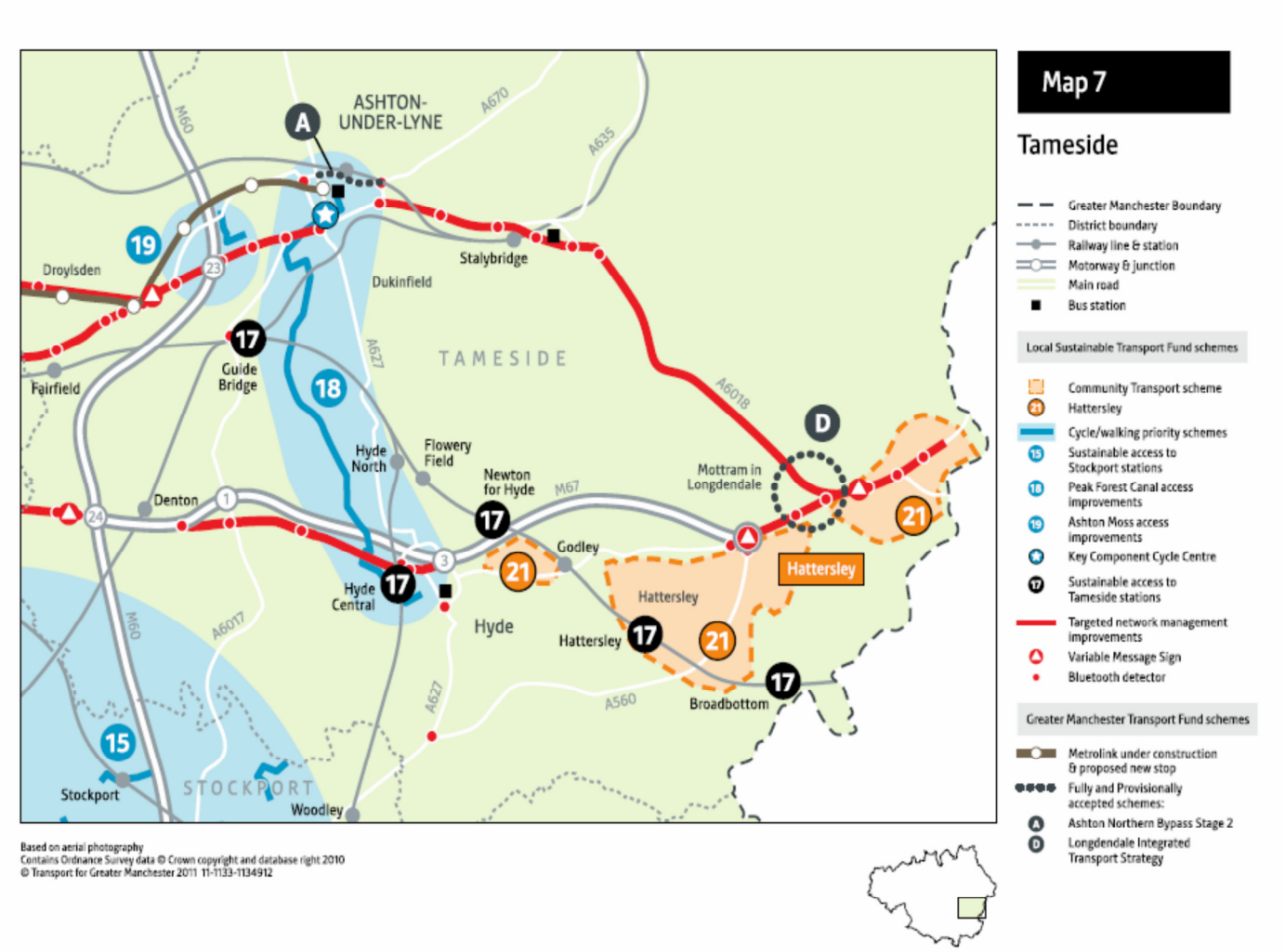


Figure A1.3: Hyde/Hattersley (Tameside) Intervention Area
Source: TfGM (2011) LSTF Large Bid Business Case.
http://www.tfgm.com/journey_planning/LTP3/Pages/LSTF.aspx

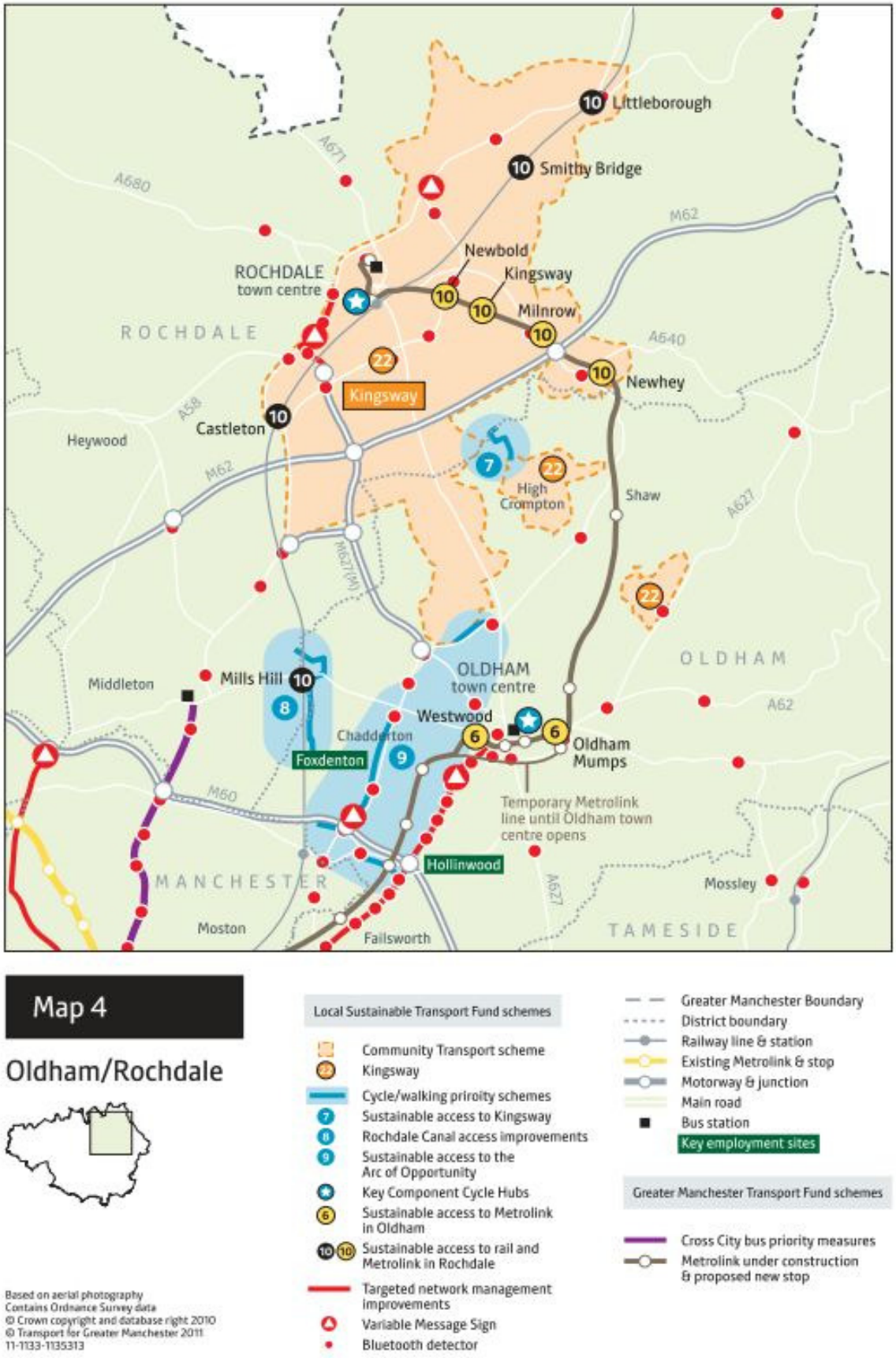


Figure A1.4: Rochdale Intervention Area

Source: TfGM (2011) LSTF Large Bid Business Case.
http://www.tfgm.com/journey_planning/LTP3/Pages/LSTF.aspx

The Leicestershire County Council LSTF project (Tranche 2 Small Bid) 'Smarter Travel for Business' focuses on the two market towns of Loughborough and Coalville. The LSTF project is split into a range of package elements grouped according to the three themes of 'Getting to Work and Training', 'Information and Behaviour Change' and 'Smarter Travel Infrastructure'.

Given that the project elements in Loughborough are scheme-based whereas those in Coalville are town-based, the focus on the evaluation being conducted by Loughborough University is on a comparison between the small town of Coalville (population of around 35,000) and a control town of Hinckley. Key features of the Coalville area are shown by Figure A1.5 and features of the interventions are shown in Figure A1.6.

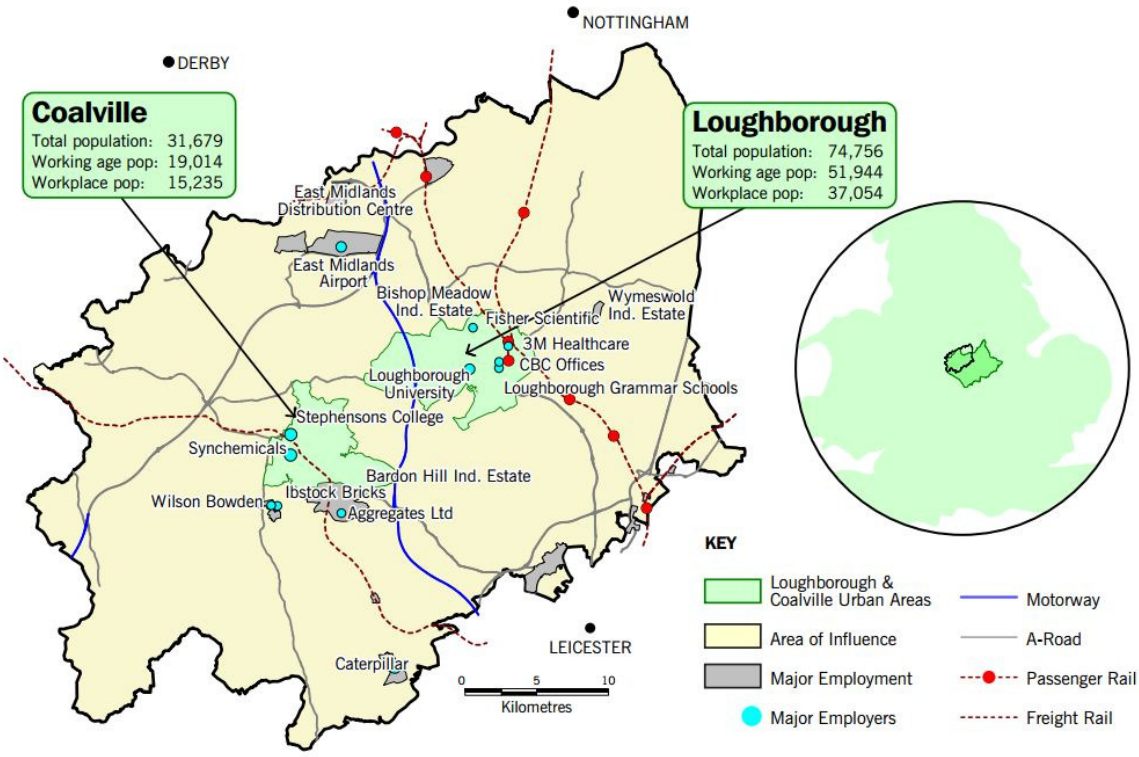


Figure A1.5: Loughborough and Coalville
Source: Leicestershire County Council (2012) DfT LSTF bid – 'Smarter Travel for Business', p.1

Despite its initial selection as a control area, it should however be noted that a series of LSTF measures began to be implemented in Hinckley in 2015/16.

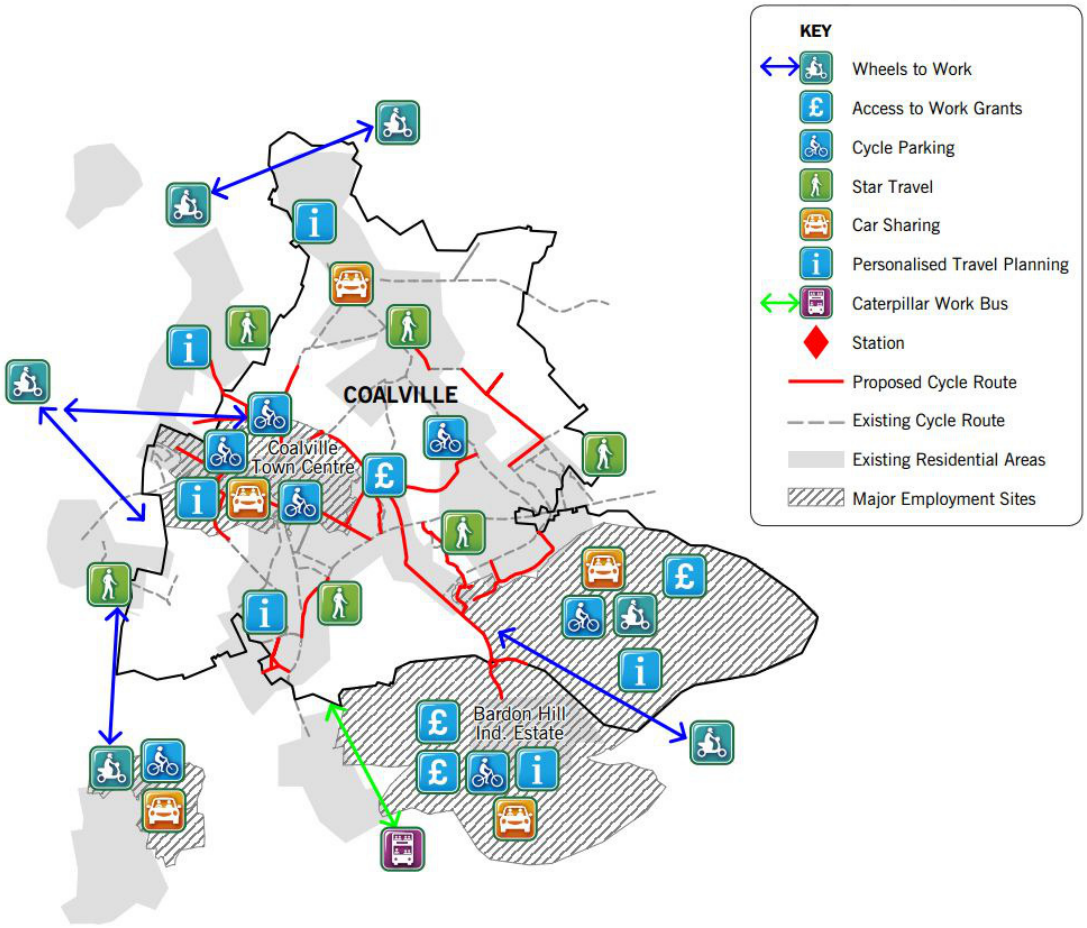


Figure A1.6: Coalville Interventions Schemes
Source: Leicestershire County Council (2012) DfT LSTF bid – 'Smarter Travel for Business', p.12

The three groups of case studies are a subset of the national population 39 Tranche 1 small schemes (announced 5 July 2011), the 43 Tranche 2 small schemes (announced 24 May and 27 June 2012) and the 13 large schemes (announced 27 June 2012).[3] In July 2014, some 44 schemes were extended to 2015/16, of which 8 were large schemes.

Our study therefore focuses on the case studies and interventions listed in Table A1.1. The primary interventions are purposely focused on physical measures. However, the impact of secondary interventions has also been assessed, with a focus on Personalised Journey Plans and Workplace Travel Plans. The sampling frame is provided by individuals drawn from the electoral register. Respondents who are affected by both physical infrastructure and smarter choice measures were identified in order to assess complementarities. For example, respondents were assessed as to whether their self-reported awareness of the primary and secondary interventions had increased year-on-year, and the proportions of those whose awareness had increased were compared against those whose awareness had not, to determine whether there were any corollaries for travel behaviour change.

[3] See: https://www.gov.uk/government/publications/local-sustainable-transport-fund

Table A1.1: List of Case Studies, Interventions and Controls

Case Study	Primary Intervention/ Treatments	Secondary Interventions/ Treatments	Control (or Comparison) Area
Eastleigh (Pop. 126,000)	Interchange	Area Travel Plan (Valley Park); College Travel Plans; Station Travel Plans; Bus Priority; Smart Cards.	West Fareham (Locks Heath) (Pop. 56,000)
Gosport (Pop. 83,000)	Bus Priority	Area Travel Plan (HMS Daedalus); Cycle Links; Interchange; Personalised Journey Planning; Smart Cards.	
Rochdale (Pop. 96,000)	Sustainable Access to Metrolink/Rail	Cycle Hub; Demand Responsive Transport; Personalised Travel Planning; Workplace Travel Plans; Smart Cards	Wigan (Pop. 82,000)
Tameside (Hyde/Hattersley) (Pop.46,000)[4]	Demand Responsive Transport/Station Access	Workplace Travel Plans; Smart Cards[5]	
Coalville (Pop. 35,000)[6]	Cycling Infrastructure	Car Sharing; Personalised Travel Planning; School Travel Plan; Wheels to Work, Business Surveys.	Hinckley (Pop. 43,000)

We also made use of secondary data from other sources, including survey work (and focus groups) that had already been undertaken, to enrich the primary data collected through our cohort surveys. For example, there was a baseline one day travel diary and attitudinal survey undertaken in Southampton by MRUK in April 2011, with 1,500 respondents. In December 2012, further similar surveys were undertaken by ICM in Portsmouth and the wider South Hampshire area, with around 1,150 responses in each area. Repeat surveys for Southampton were also undertaken by ICM in October 2013, with over 1,400 responses, and in October 2015, with 1,500 responses. The surveys were also repeated in Portsmouth and the rest of South Hampshire in December 2015, with around 750 responses in each area. Specialist supplementary on-line and postal surveys have been undertaken in South Hampshire to examine, for example, the impact of the local 'My Journey' Roadshows, Personalised Journey Plans and Workplace Travel Plans. In Leicestershire pre-bid surveys were carried out with businesses and Job Centre Plus in Coalville, which were repeated in 2014 and in 2015. Information from these surveys has been used to support the narrative in these Appendices, where relevant and available.

Our primary data baseline questionnaire was issued to a random sample of the local adult population, i.e. 16 years old or over, drawn from the edited electoral register for each case study (treatment) and control area. With the exception of Gosport (where all Wards were sampled), we focused our primary data collection on specific Wards in each Local Authority District that represented the treatment and control areas. In total 67 Wards were sampled (Eastleigh 9, Gosport 17, Lock's Heath 8, Coalville 8, Hinckley 6, Rochdale 9, Hyde 4 and Wigan 6). Ward-level maps showing primary intervention sites are given in Annex B.

[4] Based on the population of the Tameside Longendale Ward and the Hyde Godley, Newton and Werneth Wards. The Hattersley Estate is covered by the first two of these wards. Tameside's 2011 population was 219,324.
[5] Personalised Travel Planning has been undertaken in Audenshaw (Tameside).
[6] The eight wards that we sampled in the Coalville area had a population of around 45,000 – see Annex B.

A1.2 Evaluation Approach, Methodologies and Data Collection

There are a number of features of the LSTF programme that make monitoring and evaluation particularly problematic. The programmes consist of a number of small scale, targeted interventions, introduced over a period of time and a range of places, rather than the more traditional single large intervention introduced at a single point of time and place. As a result, determining population scale behaviour change from the results of interventions targeted at sub-populations is difficult. Determination of causation is also made more difficult given the multiple treatments and the possibility of strong external effects (changes in income, employment, population, price of fuel, etc.), hence difficulties in determining the counterfactual (what would have happened without the intervention).

Our approach to monitoring and evaluation is informed by work the University of Southampton undertook as part of the iConnect project (Ogilvie et al., 2011). This took a broadly experimental approach using a socio-ecological model to determine the mediating and moderating factors that led to behaviour change as a result of physical interventions to improve walking and cycling facilities. The iConnect methodology was, in turn, informed by the realist evaluation approach associated with Ray Pawson (see, for example, Pawson and Tilley, 1997) which sets up a framework to determine what policy interventions work, where, for whom and why. Our work is also informed by monitoring and evaluation studies undertaken by others, in particular the Sustainable Travel Towns study (Sloman et al., 2010) and the guidance developed for the Passenger Transport Executive Group (AECOM, 2012), as well as that developed by the Department for Transport (DfT) itself (2012). We also performed dosage analyses based on the distances from physical interventions, drawing on the approaches of Goodman et al. (2014) for the iConnect study of active travel (walking and cycling) and of Heinen et al. (2015), who have studied the impact of the Guided Bus system in Cambridgeshire.

In drawing together our evaluation methodology, we were influenced by the What Works Centre for Local Economic Growth (2015) and their interpretation of the Maryland Scientific Methods Scale of evaluation robustness. Simplifying somewhat, this involves five levels of increasing robustness. Level 1 involves naive before and after comparisons, with no attempts to deal with the counterfactual. Level 2 involves before and after comparisons with control variables. For example, data on petrol price changes has been used in conjunction with price elasticities to determine the counterfactual for car traffic. Level 3 involves before and after comparisons for a treated group and a comparison group, using for example, a difference-in-differences approach. This is the approach we have largely used in this study. Level 4 involves quasi-random comparisons, based on exposure rates for treated and control groups. We have used a variant of this approach to assess different levels of exposure (at least in two of our treatment areas) and to assess the travel behaviour impact of different levels of awareness of the LSTF measures. Level 5, randomised control trials with no contamination of the treatment and the control groups, is the gold standard of evaluation methods, but was not possible in this context given the ubiquitous nature of some interventions, such as web-based marketing and travel information systems.

Our work is also influenced by review studies of interventions such as workplace travel plans, personalised travel plans and school travel plans (e.g. Möser and Bamberg, 2008, Chatterjee, 2009, and Bonsall, 2009). These studies have highlighted potential weaknesses in the evaluation methodologies, including a preponderance of one group studies, the risks of survey response bias, inadequate sample sizes and lack of independence. In designing our methodology, we have attempted to address these weaknesses.

Our methodology has been influenced by logic maps which we see as abstract representations of reality, designed to assist in designing an evaluation of an intervention. Their use is advocated by the

Treasury's Magenta Book (HMT, 2011) with an emphasis on the context of the intervention (why it is taking place), the inputs required for the intervention (how it will take place) and the outputs (what will be produced). Outcomes then focus on short and medium term results, whilst impacts are the longer term results, although Hills (2010) cautions that one should not be obsessed about the terminology - 'the map is not the territory'. The aim of a logic map in our context is to assist in the design of the evaluation of the Local Sustainable Transport Fund (LSTF) interventions in Greater Manchester, Leicestershire and South Hampshire. Our starting point is the logic map for the primary and secondary interventions in South Hampshire and Leicestershire that are being investigated by this case study. These are shown by Figure A1.7 for TfSH and Figure A1.8 for Leicestershire.

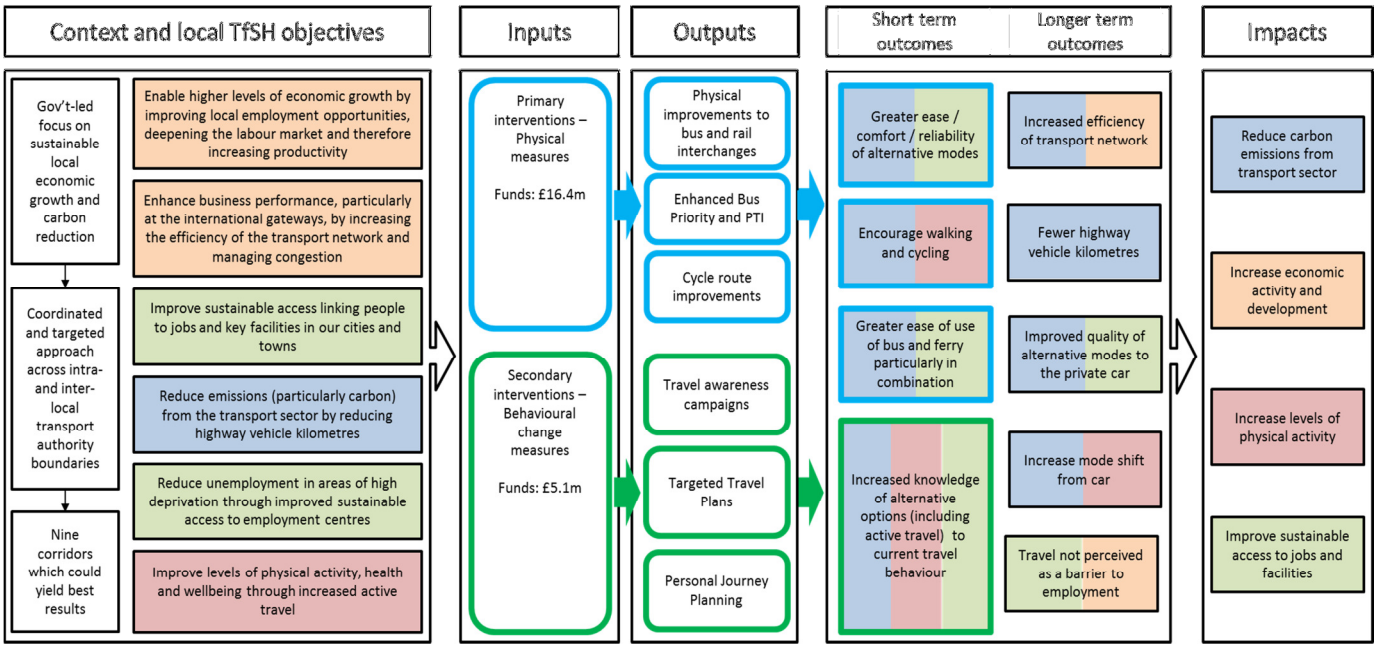


Figure A1.7: Logic Map for TfSH

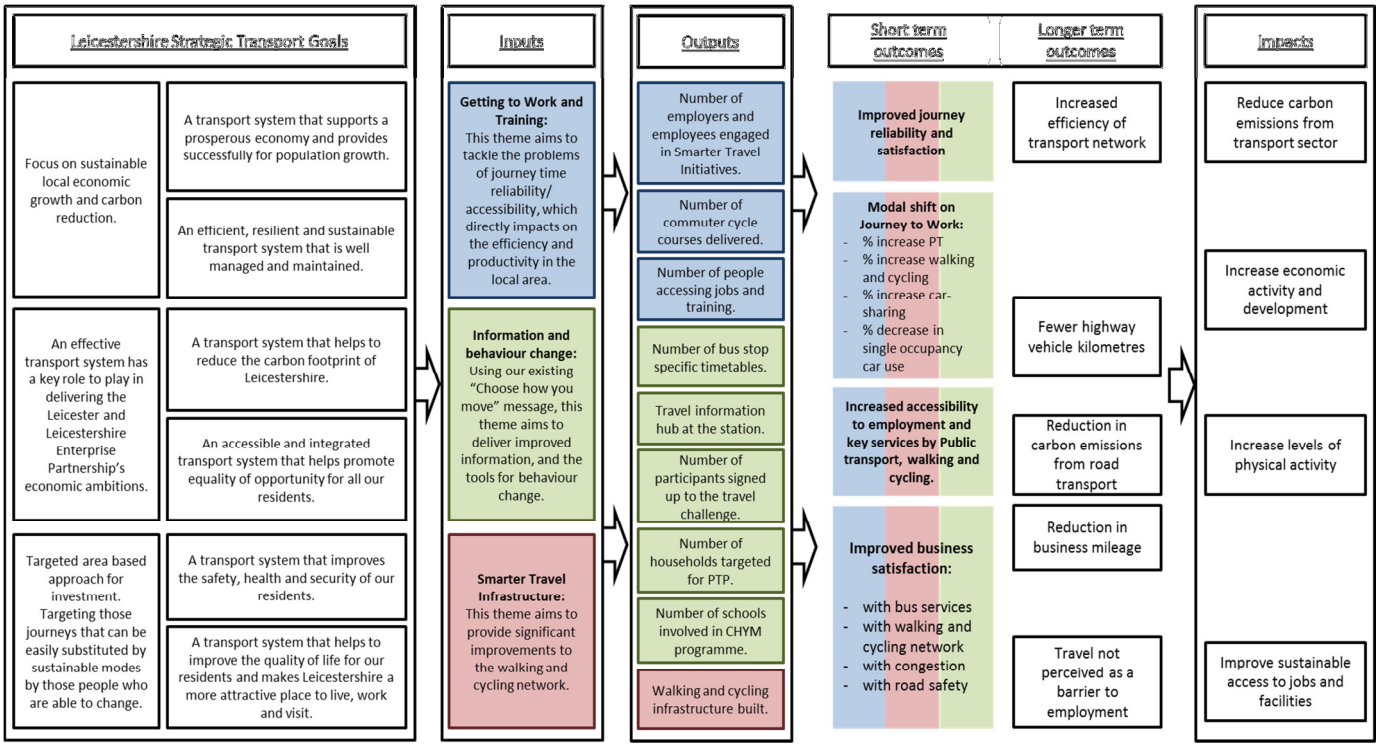


Figure A1.8: Logic map for Leicestershire

The logic maps use the terminology described further above, but relate context to the local objectives and are colour coded to highlight the key impacts, of which the most important, for the purposes of this case study, is to reduce carbon emissions from the transport sector, whilst also achieving local objectives with respect to economic development, public health and accessibility. However, this approach could be criticised as presenting a linear progression, when in reality delivering LSTF interventions, as with most interventions, are part of an iterative process.

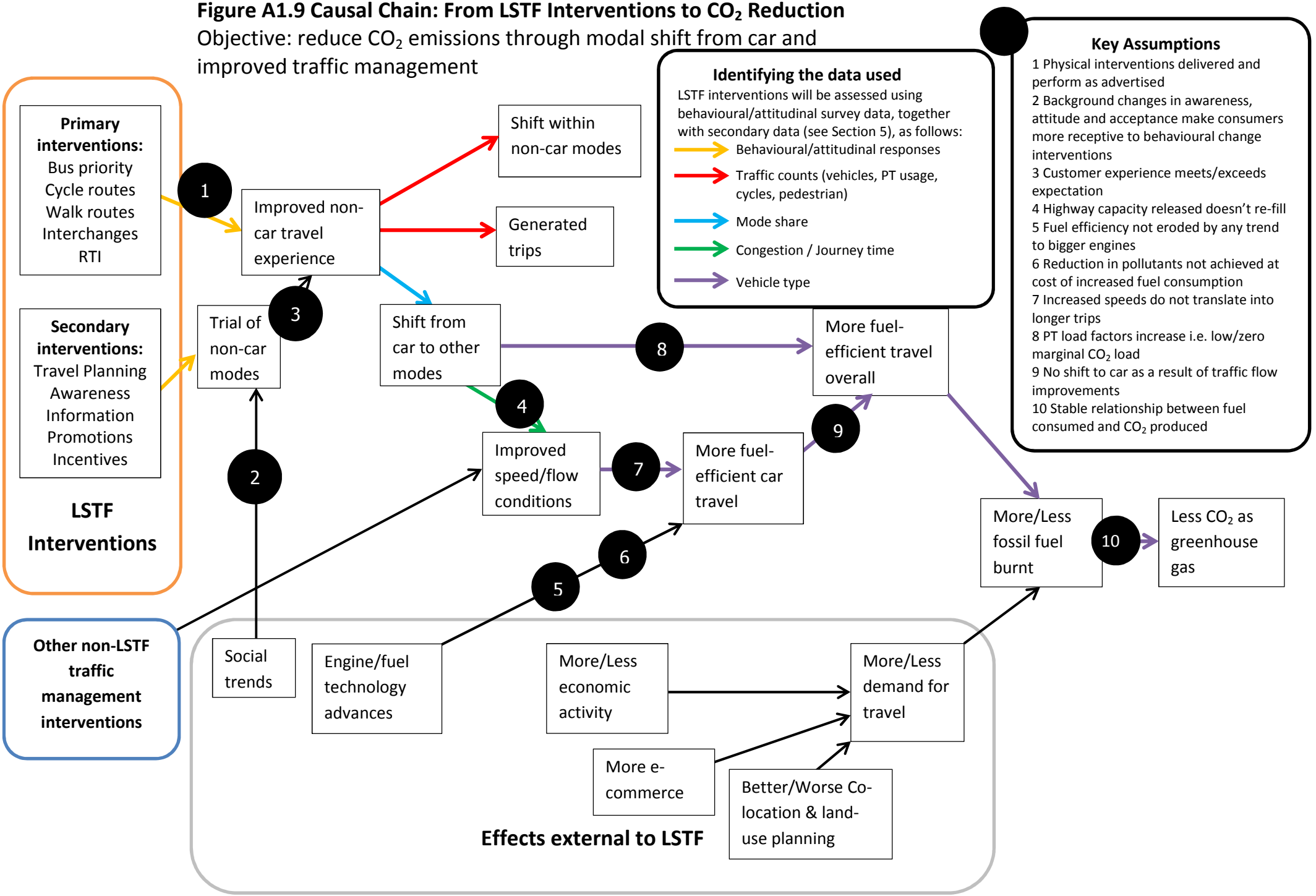
Partly as a result of the above, Transport for Greater Manchester (TfGM) has preferred to use causal chains rather than logic maps to sketch out the impacts of policy interventions. Influenced by this, we have developed a causal chain which focuses on the outputs of the LSTF interventions and relates that to data, outcomes and the key impact in terms of reduced CO_2 emissions. This is illustrated by Figure A1.9, which also highlights some of the key external effects (confounding/moderating factors) and key assumptions. It represents a simplification of the approach to evaluation developed by the iConnect project (Ogilvie et al., 2011) by focusing on the direct links between physical interventions and behavioural change. The arrows in Figure A1.9 are colour coded in order to represent the main sources of data used to determine the outcomes. The black lines refer to external effects which would require customised modelling (e.g. non LSTF Traffic Management interventions), comparison of the treatment and control areas (e.g. social trends or more/less economic activity, assuming uniform socio-economics processes) or external data on fuel/engine technology advances, which will be limited in the one year period under consideration here.

It should be noted that neither the logic maps nor the causal chain identified trip suppression as an intended outcome of the LSTF programmes, although the causal chain highlights that such an effect could be achieved as a result of external factors. However, it is possible that trip suppression is an unintended effect of LSTF programmes where negative messages about car use are not complemented by positive messages concerning active travel and public transport use.

Our methodology was presented to an Expert Workshop held in London on 13th May 2014, which included recognised experts from University College London/TRL, the Universities of the West of England and of Hertfordshire, members of the Department for Transport who were involved in the project and representatives from the Case Study team, including those from Transport for Greater Manchester, Leicestershire County Council, Transport for South Hampshire, and the University of Southampton. A description of the Case Study and its objectives was presented at the workshop, along with the approach to monitoring and evaluation, some preliminary results from the before survey, and the issues for consideration which were subsequently discussed. The expert group gave broad approval for the methodology adopted, but advised that the method should be kept under continuous review and that caution should be exercised when inferring individual level behaviour from aggregate data.

Figure A1.9 Causal Chain: From LSTF Interventions to CO_2 Reduction

Objective: reduce CO_2 emissions through modal shift from car and improved traffic management



A1.3 Primary Data Collection

It was proposed that the primary medium for data collection would be an adaptation of the iConnect self-completion survey tool. This involves using a paper survey (see Annex A) that the randomly-selected participants in the previously identified wards were asked to complete. In this case, the data collected include respondents' attitudes to sustainable travel, their awareness of LSTF-related transport schemes, a seven-day travel diary, as well as demographic information such as the age and gender of the person completing the survey. The survey was sent to participants in two stages, in an initial (or before) survey, and a follow-up (or after) survey over the same period a year later to those who had responded to the initial survey. Experience from the iConnect project suggested a high level of non-response to both surveys. Hence, the project team had planned to send out reminders to those who did not respond to the before survey, and similarly for the after survey, if required.
To test the proposed survey instrument and administrative procedure, a pilot survey was conducted in Woolston, Southampton in November 2013. Some 131 surveys were returned: 98 completed surveys, 8 blank surveys and 25 returned to sender. The response rate, in terms of completed responses, was 9.8%, close to the expected 10% response rate in the main survey. Most of the complete surveys (90 out of 98) arrived within a month after posting the initial packs. The pilot confirmed the choice of survey method and the survey instrument design.

Using the approach suggested by AECOM (2012, Box 3.3), we estimated that for each site, around 384 usable responses would be sufficient for statistical tests, assuming heterogeneous populations and applying 95% confidence level and a 5% error margin (see also Bartlett et al., 2001). Therefore we had aimed to collect 400 usable responses at the stage of the follow-up, i.e. 3,200 observations (or 400 x 8 sites), which meant that, given the 50% attrition rate found in the iConnect study, we needed 800 responses per site for the before survey. We anticipated a 10% response rate, hence 8,000 initial contacts were made at each site initially.

Therefore in total, 64,000 postal self-completion surveys were distributed in the before stage (to cover the 8 case study areas), with 8,461 returned overall (13.2%). However, a significant percentage of the returns (19.7%) were either incomplete or void, and hence a total of 6,797 questionnaires were available for the before survey analysis (10.6% of initial contacts) - see Table A1.2. The initial before survey response rates across all the sites were variable, with generally low response rates in the Greater Manchester areas, high response rates in South Hampshire and Leicestershire in the middle. This is despite the same research approach being applied consistently across the three different case study areas, for example, with the surveys being despatched by the same team at the same time for each area. As a remedy, a reminder survey was issued to all three Manchester sites and one of the two Leicestershire sites. Reminder survey recipients were randomly selected from non-responsive initial survey recipients and the number of reminders in each site was determined based on the number of complete survey responses and available survey budget. Despite the targeted use of these reminders, the response rates were still highest in Fareham (15.2%) and lowest in Wigan (7.3%) - see Table A1.2.

Recipients were incentivised to complete the paper surveys through a prize draw for vouchers of £25, with 20 awards given randomly to each area. Each returned survey was logged and divided into three groups - those that were 'Completed', those that were returned 'Not completed', and cases of 'Return to Sender', i.e. where the respondent was no longer known at the address being targeted.

The breakdown of Completed, Incomplete and Return-to-Sender responses for those who had been sent the before postal surveys is shown in Table A1.2.

Table A1.2: Cohort Survey Response Rates (as at End April 2014)

	Distributed	Return to Sender	Completed	Not Completed	Total	Response rate: Completed
Rochdale	8,000	196	755	38	989	9.4%
Tameside	8,000	135	824	56	1,015	10.3%
Wigan	8,000	203	587	20	810	7.3%
Greater Manchester	**24,000**	**534**	**2,166**	**114**	**2,814**	**9.0%**
Coalville	8,000	183	794	31	1,008	9.9%
Hinckley	8,000	90	834	11	935	10.4%
Leicestershire	**16,000**	**273**	**1,628**	**42**	**1,943**	**10.2%**
Eastleigh	8,000	150	900	166	1,216	11.3%
Fareham	8,000	115	1,219	52	1,386	15.2%
Gosport	8,000	154	884	64	1,102	11.1%
South Hants	**24,000**	**419**	**3,003**	**282**	**3,704**	**12.5%**
Total	64,000	1,226	6,797	438	8,461	10.6%
% of surveys sent out		1.9%	10.6%	0.7%	13.2%	

The completed survey responses were then transcribed into electronic (csv) files by a third party agent, Wyman-Dillon. Guidance was provided to the clerks at Wyman-Dillon for the transcription of cases where data entry issues existed, for example:

- where multiple selections had been selected instead of one (e.g. respondent ticked both 'strongly agree' and 'agree');
- the answer was stated in the wrong units (e.g. 'Km' instead of miles);
- a textual response was given instead of a tick or a code (e.g. specified 'worked 30 hours' rather than ticked 'worked full time' or 'part time');
- a range or sequence of values had been specified when a fixed one was expected (e.g. '10-15 miles walked per week'); and
- where the answer did not fit the instruction given (e.g. stated 'Shopping' for the 'Other' mode of travel).

Annex C provides details of the guidance given. This was supplemented by a summary of the rules for data exception and error handling (see A1.4 below).

For privacy reasons, the surveys (and therefore the electronic file records) excluded respondents' names and addresses to protect their identities, but included their Unique IDs as assigned and

printed on the survey forms. It was therefore possible to reconcile each survey entry subsequently with the individual where required e.g. for the purpose of despatching vouchers to those who had won the prize draw, although the two datasets were kept separate at all times. In a few cases, it was not possible to determine the respondent, as they had torn off the front and/or back sheet of the survey which contained the survey instructions and their Unique IDs. These responses were however included in the overall electronic dataset, and were separately classified as 'No IDs'. Where possible, these respondents were later traced through other information provided on the survey forms, including age, gender and home postcode (where supplied), and these records were manually updated with their Unique IDs. This Unique ID includes a code identifying each treatment area (e.g. 'R' for Rochdale), as well as a serial number. After transcription, the paper surveys were scanned onto electronic media (PDFs) for reference purposes by another third party, Castle Documents, and kept in locked storage until their secure disposal. (Castle Documents are accredited for the disposal of confidential NHS records.) However, it was found subsequently that the final collected electronic dataset delivered by Wyman-Dillon only comprised a total of 6,780 Completed records, as a batch of records did not get transcribed. A further 20 records were then manually entered into the dataset, where the paper surveys still existed, creating an initial before survey dataset of 6,800 Completed records. However, this included two surveys which were subsequently found to be under-aged, and therefore ignored, and a further one with no gender (or ID) which could not be traced, thereby providing a total of 6,797 Completed records following data cleansing and processing.

A1.4 Data Cleansing

The electronic records were cleaned and 'post-processed' by the University of Southampton, with further consistency checks performed on the cleaned and post-processed data. The data was initially cleaned 'by eye' to resolve issues which had previously been identified through data entry, for example in those records with multiple selections, a range, or where the answer had been given in the wrong units. Post-processing then involved:

- consolidating and coding up categorical data, e.g. for 'Other' modes of travel (for example, to assign a value of '8' for cases where the respondent had specified 'plane', 'flying', 'by air', 'air travel' or 'flight'; and '10' for 'ferry', 'ship', 'boat', 'Gosport ferry' or 'Isle of Wight ferry');
- converting individual data items into the appropriate base units for subsequent analysis, e.g. by combining 'hours' and 'minutes' into a 'total travel time' in minutes;
- calculating additional field values which are required for further analysis, e.g. the walking rate ('speed'), cycling speed, bus speed and so on; and
- adding calculated 'flags' for where there appeared to be data inconsistencies, e.g. where the walking speed is calculated at more than 10 miles per hour.

The rules for data cleansing, post-processing, and exception and error handling were also discussed and documented. Further consistency checks were then performed on the data, where exceptions and inconsistencies could be identified, and 'reasonableness' tests of data quality conducted using other information supplied, e.g. comparing work travel distance and speed against the given home and work postcodes on Google maps. In the end, a significant proportion of respondent marking and transcription errors were found in the completed dataset, with over 20% of the records

requiring at least one data item to be corrected. Examples of user marking and data entry errors that required resolution include:

- where people did not follow instructions, e.g. they entered 'None' or 'N/A' for 'Other (please specify)' mode of transport instead of ticking the 'Zero journeys' box;
- alternatively, they ticked the 'Number of times' instead of 'Zero journeys' box;
- inconsistent time and distance entries, e.g. 10 minutes' walking and 3 miles for distance (i.e. implies running quicker than a 4 minute mile), or they have added up the journey times over 7 days but not distance, or vice-versa;
- they did not put the right entries into the right boxes, e.g. travel 'hours' were put into 'minutes' or vice-versa, e.g. 40 into 'hours' instead of 'minutes';
- they put the same entry into *both* the hour and minute boxes, e.g. 1 hour and 60 minutes (which gives rise to an incorrect overall time calculation);
- they entered a breakdown of the number of journeys into the 'hours' box, and the journey time in the 'minute' box, e.g. 2 journeys of 30 minutes instead of '1 hour' and no minutes;
- they put time and distance into different mode boxes, e.g. 20 hours by car (and no distance), and 300 miles by train (with no time);
- students can interpret their journeys as being into 'work' instead of 'study', although this could be because they work part-time (when no 'work situation' is given); and
- people confuse different journeys for different purposes, e.g. the journey time and distance for shopping has been entered into 'work'.

It should also be noted that the data collected can be textual in many cases, even where numeric values had been expected, e.g. just a tick or 'yes' for 'number or times' (travel frequency). The validity of some data was also difficult to determine, e.g. '120' journeys in the course of business over 7 days for a care worker, and these were left 'as is' unless there was reasonable doubt to contradict this through other information supplied. Some imputation was also required, e.g. to calculate the work distance, as it was not possible to discern this where no work address or postcode had been given.

As a consequence of these issues and errors, a large proportion of the cleaning, consistency checking and data correction had to be performed manually, as well as the coding component in post-processing. This was therefore a labour-intensive process, and the scale of the manual effort involved should not be underestimated for future surveys. However, the knowledge gained through this process did help the design and processing of the subsequent after surveys for 2014-15, although the questions asked and the 'look and feel' of the latter survey was kept consistent with the before survey.

A1.5 Weighting the Before Sample

The final 'Completed' before surveys dataset comprised 6,797 respondents (=N). This includes 14 cases of records of No-IDs (reduced from an original 18), but excludes two surveys where the

respondents were minors, as it was not possible to obtain legal consent for their inclusion in the analysis, and one No ID respondent which was missing gender.

An analysis of the age and gender distribution of the survey respondents was conducted, and compared to local population estimates from mid-2012. This breakdown is shown in Table A1.3.

Table A1.3: Age and Gender Distribution of Survey Respondents versus Local Population Estimates

		Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport	No ID	All
Gender distribution											
Frequency	Male	375	422	291	395	398	437	625	441	6	3,390
	Female	379	402	296	394	433	462	593	441	7	3,407
	missing	0	0	0	0	0	0	0	0	1	1
	valid sum	754	824	587	789	831	899	1,218	882	13	6,797
Percentage	Male	49.73	51.21	49.57	50.06	47.89	48.61	51.31	50.00	46.15	49.87
	Female	50.27	48.79	50.43	49.94	52.11	51.39	48.69	50.00	53.85	50.13
Age distribution											
Frequency	17-29	69	68	74	57	52	73	76	62	0	531
	30-44	113	126	113	131	160	162	182	139	2	1,128
	45-59	206	206	136	242	237	253	395	252	6	1,933
	60-74	225	277	180	243	266	278	390	284	2	2,145
	75 and over	87	94	34	70	68	88	123	94	2	660
	missing	54	53	50	46	48	45	52	51	2	401
	valid sum	700	771	537	743	783	854	1,166	831	12	6,397
Percentage	17-29	9.86	8.82	13.78	7.67	6.64	8.55	6.52	7.46	0.00	8.30
	30-44	16.14	16.34	21.04	17.63	20.43	18.97	15.61	16.73	16.67	17.63
	45-59	29.43	26.72	25.33	32.57	30.27	29.63	33.88	30.32	50.00	30.22
	60-74	32.14	35.93	33.52	32.71	33.97	32.55	33.45	34.18	16.67	33.53
	75 and over	12.43	12.19	6.33	9.42	8.68	10.30	10.55	11.31	16.67	10.32
Local population	Male	49.01	49.09	49.65	49.57	49.2	49.01	49.02	49.4		
estimates	Female	50.99	50.91	50.35	50.43	50.8	50.99	50.98	50.6		
(mid 2012)	17-29	22.21	20.79	20.06	17.37	17.09	18.89	16.83	20.12		
	30-44	25.59	25.16	25.29	24.87	24	25.46	22.4	24.51		
Percentage	45-59	25.4	25.96	25.6	26.74	26.55	26.45	26.64	25.42		
	60-74	17.99	19.1	20.42	21.28	22.03	19.14	21.96	19.21		
	75 and over	8.81	8.98	8.62	9.84	10.32	10.07	12.18	10.74		

From Table A1.3, it can be seen that the completed gender survey sample (n=6,797) is broadly balanced between males and females, although slightly skewed towards male respondents as compared to local population estimates, apart from in the case of Wigan, Hinckley and Eastleigh, where it is skewed towards female respondents. However, these effects are relatively small for each area and overall. This is illustrated further in Table A1.4, which shows the potential gender weightings which could be applied, if the relative percentages of males and females were calculated for each area.

Table A1.4: Potential Gender Weightings by Area

		Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
Gender	Male	0.99	0.96	1.00	0.99	1.03	1.01	0.96	0.99
Weightings	Female	1.01	1.04	1.00	1.01	0.97	0.99	1.05	1.01

As these gender differences were very small (with weighting factors in the range 0.96 to 1.05), no gender weighting was applied to the before survey analysis.

Table A1.3 above does however show that the age group between 17 and 29 are severely under-represented in the before survey, across all the areas and overall. This is not unusual, based on

previous experience of the propensity of different age groups in responding to surveys. However, the survey sample is also under-represented for those aged between 30 and 44, whereas those between 45 and 59 and from 60-74 are over-represented. These differences are illustrated in Table A1.5, which shows the weightings which could be applied if the relative percentages of each age group were calculated against the population. The range of these weighting factors is from 0.53 to 2.70.

Table A1.5: Proposed Age Weightings and their Variance by Area

		Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
Age	17-29	2.25	2.36	1.46	2.26	2.57	2.21	2.58	2.70
Weightings	30-44	1.59	1.54	1.20	1.41	1.17	1.34	1.44	1.47
	45-59	0.86	0.97	1.01	0.82	0.88	0.89	0.79	0.84
	60-74	0.56	0.53	0.61	0.65	0.65	0.59	0.66	0.56
	75 and over	0.71	0.74	1.36	1.04	1.19	0.98	1.15	0.95
		Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
Variance of	17-29	1.25	1.36	0.46	1.26	1.57	1.21	1.58	1.70
Weightings	30-44	0.59	0.54	0.20	0.41	0.17	0.34	0.44	0.47
(Expected value of 1)	45-59	-0.14	-0.03	0.01	-0.18	-0.12	-0.11	-0.21	-0.16
	60-74	-0.44	-0.47	-0.39	-0.35	-0.35	-0.41	-0.34	-0.44
	75 and over	-0.29	-0.26	0.36	0.04	0.19	-0.02	0.15	-0.05

The age bias in the sample may help to explain in part some initial findings based on the unweighted before sample that the mean number of journeys for study/education is relatively low, as well as the low proportions of cycling distances generally, as younger people would be expected to conduct more study trips, and they would typically cycle for longer distances. However, these weights would not necessarily address all the differences between the unweighted survey data and those reported by the National Travel Survey and the 2011 Census, due to other factors such as definitional differences and survey fatigue. In addition, applying weights resulted in the number of travel journeys deviating from whole numbers, although it was not proposed that these were rounded to the nearest integer for aggregation purposes. Applying these weightings also removed some records from the dataset, where the age of the respondent is unknown and could not be determined retrospectively through the electoral register (n=401), although 17 of these did not complete the Travel Diary section in any case, i.e. the maximum before (weighted) sample size became 6,396 for a time and distance travelled analysis.

It is recognised that a less desirable by-product of weighting is that it can, when the variance of the weights is large, result in standard errors that are larger than they would be for un-weighted estimates, although we do not believe the variance of the weights, as shown in Table A1.5, is large. The difference in the precision of the estimates produced by a complex design (in this case a weighted sample) relative to a simple random sample is known as the design effect (deff). The design effect is the ratio of the actual variance, under the sampling method used, to the variance calculated under the assumption of simple random sampling. This can then be used to obtain the effective sample size, neff, which gives, for a complex survey design, the sample size that would have been required to obtain the same level of precision in a simple random sample. If the effective sample size is close to the actual sample size, then we have an efficient design with a good level of precision. In order to correctly estimate variance when analysing survey data with a complex design,

three main statistical approaches are available: Taylor Series approximation, Balanced Repeated Replication (BRR) and extensions of the jack-knife - see Groves et al (2004) and Skinner et al. (1989), and advanced statistical packages such as Stata now have these approaches available (Sturgis, 2004). Compensation for these design effects was discussed with the Department for Transport, and consideration was given as to how these would be incorporated into the analysis of the after surveys, including an evaluation of different weighting methods which could be applied.

A1.6 After Study

The results of the before survey were compared to an after survey that commenced in November 2014, i.e. conducted at the same time of year as the previous survey. A follow-up questionnaire was sent to those individuals who had replied to the previous 2013 survey (N=6,797). A filter was applied to exclude from this process any previous respondents who had indicated that they did not wish to participate in any further surveys (although there are only 42 of these) and/or (where identifiable) had moved out of either the treatment or control areas. The after survey tool followed the same format as the previous questionnaire, with identical travel and household-related questions being asked in the same order, to maintain consistency and enable year-on-year comparison with the previous survey. However, from the experience of the data cleansing exercise conducted previously, where some people had failed to read the instructions carefully, some minor font and lay out changes were made to clarify the completion instructions for respondents, for example by explicitly emboldening the purpose associated with each travel diary section (e.g. relating to 'work', as opposed to later sections that are for 'shopping and personal business' and 'to visit friends and relatives and for other social activities'). Following the advice of the Experts Workshop conducted in May 2014, further questions were inserted to determine whether and the extent to which locally-funded travel schemes and transport infrastructure improvements had affected people's travel behaviours, and following feedback from a teleconference with the Department on 17th October 2014, the options offered were 'No change', 'A little change' and 'A lot of change', and these three categories were scored on a corresponding scale from 1 to 3, to enable a quantitative assessment to be made, and provide comparisons with existing questions that assess the extent to which people were aware of the transport schemes and infrastructure improvements.

Given the experience from the iConnect project (particularly for their after survey conducted in 2012), the prize draw was changed from 20 awards of £25 vouchers as used in the before survey to 100 prizes of £5 gift vouchers in the follow-up. It was argued at the time that the higher number of potential winners provided a greater incentive for people to participate in the follow-up survey, as it increases people's chances of winning a prize (albeit for less money). However the exact percentage responses could not be guaranteed, as it depended on other factors, for example the degree of 'natural churn', e.g. in older people who have died and those moving homes, which also reduced response rates and varied between survey areas. Nonetheless, if the replies for the survey areas overall were typical of similar longitudinal cohort surveys conducted previously, it was expected that a target response of 1,920 and 1,152 respectively for the five treatment and three control areas (= 384 x 5 and 384 x 3 respectively) could be achieved from a follow-up poll of the 6,745 before survey participants (who have not opted out), as this requires a response rate of around 46%, i.e. less than the 50% found in the iConnect study. In any case, a review was conducted in January 2015 to assess the status of the after survey responses and, where necessary, reminders were sent to those respondents who had yet to reply. This review led to reminders being sent to all

non-respondents, except those from Fareham where the minimum number of completed responses (384) was exceeded in the first round.

In summary, from the original 6,797 people who responded to the before survey between December 2013 and March 2014, a follow-up survey of 6,745 questionnaires was despatched in November 2014. This after survey excluded those who had indicated that they did not wish to be contacted for further surveys, had moved out of the area, or did not have a recognisable ID, and the responses to this survey are given by Table A1.6.

Table A1.6: After Survey Response Rates

	Follow-up Surveys Sent[4]	Return-to-Sender	Incomplete	Completed	Total Returned	Returned Response Rate (%)
Rochdale	750	10	6	343	359	47.9%
Tameside	817	8	6	422	436	53.4%
Wigan	586	6	1	233	240	41.0%
Greater Manchester	**2,153**	**24**	**13**	998	**1,035**	48.1%
Coalville	779	15	12	386	413	53.0%
Hinckley	825	11	9	486	506	61.3%
Leicestershire	**1,604**	**26**	**21**	872	**919**	57.3%
Eastleigh	895	17	2	524	543	60.7%
Fareham	1,216	8	2	640	650	53.5%
Gosport	877	10	3	528	541	61.7%
South Hants	**2,988**	**35**	**7**	1,692	**1,734**	58.0%
Total	6,745	85	41	3,562	3,688	54.7%
% of Total surveys		1.3%	0.6%	52.8%	54.7%	

From Table A1.6, it can be seen that in the after survey 3,688 questionnaires were returned, representing a response rate of 54.7%. However, 1.9% of these were returned-to-sender or incomplete, giving 3,562 completed questionnaires and a response rate of 52.8% which was above our target of 50%.

Our aim was to have 400 observations for each of the eight areas in the after survey and hence at least 3,200 questionnaires overall. In the event, we received over 3,500 completed questionnaires in total but failed to achieve 400 completed questionnaires in three of the eight survey areas,

namely Coalville, Rochdale and, particularly, Wigan. There was again a large variation in response rates between the survey areas, with the highest response rate in Gosport (61.7%) and the lowest in Wigan (41.0%).

Both the before and after datasets were extensively cleaned, using the processes as previously described in Appendix A1.4 above. In addition, the before and after records were matched and reviewed, based on ID, age, gender and home postcode, to remove data inconsistencies and entries where: (i) different members of the same household had completed the before and after surveys, (ii) respondents had subsequently moved out of the treatment or control area (but not where they moved within the same area), and (iii) where respondents had completed both the original survey and the reminder ones (either for the before or the after survey). The matched records were assessed again for representativeness, and it was found that, although the matched sample was broadly representative in terms of gender, it was again not representative in terms of age, with a similar skew towards male respondents as compared to local population estimates. In particular, those aged 19 to 44 were under-represented and those aged 60 to 74 over-represented. This phenomenon was evident in the before survey and reinforced in the after survey. A number of variables to re-weight the sample were considered, including income and economic activity status, but age was found to be the most appropriate. The weights used are given by Table A1.7, and it can be seen that the weights varied from 0.43 (for 60 to 74 year olds in Tameside) to 4.99 (for 17 to 29 year olds in Coalville, Hinckley and Fareham). It should be noted that the weights in Hinckley and Fareham were trimmed using the methodology proposed by Liu et al. (2004), which had been discussed and agreed with the DfT. It should also be noted that, based on age, gender and postcode matching, the before and after sample size reduced slightly to 3,445. If the approximation developed by Kish (1965) is used, the effective sample size as a result of these weights is computed as 1,997, implying a design effect of 1.725.

Table A1.7: Implemented Age Weightings by Area

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
17-29	4.49	4.42	2.30	4.99	4.99	4.77	4.99	4.67
30-44	2.13	2.18	1.93	2.37	1.73	2.01	2.44	2.54
45-59	0.99	1.08	1.28	0.97	1.00	0.96	0.98	0.95
60-74	0.46	0.43	0.44	0.52	0.56	0.46	0.58	0.44
75 and over	0.52	0.65	0.78	0.60	0.92	0.76	0.82	0.73

The 3,445 matched dataset represents a 51.1% return on those who had responded to the before survey and were invited to complete the after one, after stripping out all nil-responses, incorrectly completed surveys, and those where the respondent had changed or moved out of the area. This matched dataset is used for the travel behaviour analysis given in the next section (Appendix 2), which also applies the weightings as shown in Table A1.7 above. In addition, there is one respondent who did not supply their age in either the before or after survey, who for completeness has been included in the market segmentation analysis that is given in the subsequent section (Appendix 3).

Appendix 2: Travel Behaviour

In order to determine whether the LSTF interventions lead to significant mode shift to sustainable travel modes and/or a reduction in the number of car trips/journey distance, we need to examine changes in patterns of travel behaviour. In this Appendix, we detail the travel behaviour from our primary data collection, comparing the difference between the before and after surveys ('year-on-year'), and across the treatment and control areas, i.e. using a difference-in-differences approach. Changes in the volume of travel can be measured in three ways: number of round trips per week, number of miles travelled per week, and time spent travelling per week. Firstly (section A2.1), we examine total travel, in terms of trips by journey purpose and time/distance by mode, and assess whether there has been any change year-on-year. We then provide these results in detail (sections A2.2 to A2.6) across the five specific journey purposes (work, business, education, shopping/ personal business and social/leisure/visiting). A geocoded 'dosage' analysis was also conducted (section A2.7), for the Eastleigh and Rochdale treatment areas, both within-subjects and between-subjects (as compared to Fareham and Wigan respectively), to determine whether any difference-in-differences in travel behaviour change was as a consequence of respondents living closer to the LSTF-funded interventions.

A2.1 Total Travel: Trips and Distance/Time Travelled

Table A2.1a and A2.1b shows the weighted number of journeys undertaken by purpose and their means across the eight different treatment and control areas in the before and the after surveys respectively. It should be noted that observations are only included where the number of trips (including zero) has been clearly stated for each specific journey purpose.

Table A2.1a: Journeys by Purpose across the Treatment/Control Areas (Weighted) - Before Survey

Frequency of Journeys*	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All Areas	
(Excludes Unknown/Not stated)		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		
To/from Work																		
Number of journeys=	617	30%	1,016	33%	566	35%	1,079	41%	1,170	30%	1,645	38%	1,523	30%	1,356	35%	8,970	34%
Mean	2.4		3.0		3.5		3.7		3.1		3.9		2.9		3.2		3.2	
Standard deviation	4.1		6.5		5.5		9.7		4.6		6.3		4.8		5.5		6.0	
N*=	258		334		163		295		378		422		518		421		2,789	
In the Course of Business																		
Number of journeys=	147	7%	223	7%	203	12%	239	9%	472	12%	349	8%	455	9%	509	13%	2,596	10%
Mean	0.5		0.7		1.1		0.8		1.3		0.8		0.9		1.2		0.9	
Standard deviation	2.2		2.7		4.2		3.7		6.1		3.2		3.4		7.3		4.5	
N*=	269		335		179		298		376		423		534		411		2,825	
For Education/Study																		
Number of journeys=	248	12%	286	9%	89	5%	175	7%	255	7%	332	8%	415	8%	260	7%	2,060	8%
Mean	0.9		0.8		0.5		0.6		0.7		0.8		0.7		0.6		0.7	
Standard deviation	4.2		5.4		2.4		3.0		2.7		3.1		3.3		2.8		3.5	
N*=	269		344		178		301		391		436		554		423		2,896	
For Personal Business and Shopping																		
Number of journeys=	601	29%	964	31%	501	31%	777	29%	1,297	34%	1,228	28%	1,764	35%	1,133	29%	8,265	31%
Mean	3.2		3.6		3.8		3.1		4.3		3.5		4.1		3.3		3.7	
Standard deviation	3.4		4.6		3.8		3.3		5.7		4.0		5.2		3.8		4.4	
N*=	189		265		132		250		303		354		430		340		2,263	
For Social/Visiting																		
Number of journeys=	436	21%	614	20%	265	16%	388	15%	666	17%	777	18%	861	17%	620	16%	4,627	17%
Mean	2.2		2.5		1.9		1.6		2.3		2.2		2.0		1.8		2.1	
Standard deviation	4.0		9.6		3.0		2.4		3.9		4.3		3.4		3.8		4.7	
N*=	194		241		137		239		293		351		424		336		2,215	
Across All Purposes**																		
Total number of journeys=	2,048	100%	3,102	100%	1,624	100%	2,657	100%	3,860	100%	4,331	100%	5,018	100%	3,878	100%	26,519	100%
Mean	9.6		10.3		11.3		9.4		11.1		10.6		10.2		10.0		10.3	
Standard deviation	10.3		20.9		10.8		12.7		13.8		12.8		12.7		15.8		14.3	
N** (Sample Size)=	213		300		144		283		349		407		491		387		2,574	

* Age weighting applied, with travel frequencies rounded to nearest integer. Includes cases where the journey frequency is zero, but not where the travel diary section has been left blank or the respondent's age is unknown.

** Journeys where at least one trip is made, i.e. excludes cases where the frequency of journeys for ALL purposes are either zero, unknown or not stated.

Table A2.1b: Journeys by Purpose across the Treatment/Control Areas (Weighted) - After Survey

Frequency of Journeys*	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All Areas	
(Excludes Unknown/Not stated)		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		% by purpose		
To/from Work																		
Number of journeys=	694	35%	932	37%	472	39%	968	39%	1,162	36%	1,430	36%	1,577	37%	1,265	38%	8,501	37%
Mean	2.5		2.7		2.5		3.0		2.8		3.2		2.8		2.9		2.8	
Standard deviation	4.8		5.4		4.2		5.6		4.9		5.6		5.1		5.9		5.3	
N*=	282		347		187		327		410		450		560		439		3,002	
In the Course of Business																		
Number of journeys=	190	10%	240	10%	139	11%	288	12%	357	11%	318	8%	349	8%	302	9%	2,182	10%
Mean	0.7		0.7		0.8		0.9		0.9		0.7		0.6		0.7		0.8	
Standard deviation	6.7		2.8		4.1		5.3		4.3		3.0		2.1		2.8		3.9	
N*=	266		345		183		304		387		446		542		426		2,899	
For Education/Study																		
Number of journeys=	151	8%	167	7%	25	2%	129	5%	201	6%	301	8%	340	8%	292	9%	1,606	7%
Mean	0.6		0.5		0.1		0.4		0.5		0.7		0.6		0.6		0.5	
Standard deviation	3.0		2.7		1.0		2.3		2.2		3.3		3.8		3.6		3.0	
N*=	274		356		186		311		407		463		562		449		3,008	
For Personal Business and Shopping																		
Number of journeys=	568	29%	815	32%	388	32%	695	28%	1,022	32%	1,141	29%	1,296	30%	945	29%	6,870	30%
Mean	3.4		3.3		3.4		3.2		3.8		3.6		3.4		3.3		3.4	
Standard deviation	4.9		4.0		3.6		4.3		4.1		3.8		3.6		4.6		4.1	
N*=	168		245		115		215		272		319		381		288		2,003	
For Social/Visiting																		
Number of journeys=	353	18%	360	14%	197	16%	378	15%	493	15%	733	19%	700	16%	504	15%	3,718	16%
Mean	2.1		1.5		1.8		1.7		1.8		2.2		1.8		1.6		1.8	
Standard deviation	3.9		2.8		2.5		3.5		2.7		4.2		3.1		3.7		3.4	
N*=	170		240		111		228		270		326		380		320		2,045	
Across All Purposes**																		
Total number of journeys=	1,957	100%	2,513	100%	1,222	100%	2,458	100%	3,234	100%	3,924	100%	4,263	100%	3,307	100%	22,877	100%
Mean	10.6		9.6		10.3		9.8		10.2		10.8		9.9		9.7		10.1	
Standard deviation	14.8		11.5		10.2		14.8		11.9		13.8		10.7		13.2		12.7	
N** (Sample Size)=	184		263		119		250		316		363		429		342		2,266	

* Age weighting applied, with travel frequencies rounded to nearest integer. Includes cases where the journey frequency is zero, but not where the travel diary section has been left blank or the respondent's age is unknown.

** Journeys where at least one trip is made, i.e. excludes cases where the frequency of journeys for ALL purposes are either zero, unknown or not stated.
Note: the number of observations varies by journey purpose, and across all purposes. Where a respondent has stated the frequency for one purpose but not another (where a trip is also made for that purpose), the aggregate is treated as unknown, and the record excluded from the mean calculation across all purposes.

Note that the size of the before and after surveys matched samples, i.e. the number of unique individuals who completed both the before and after surveys, is 3,445. However, the total size of the dataset where respondents specified the number of journeys undertaken across *all* purposes (including true zeros) is less than this, at 2,574 for the before dataset, and 2,266 for the after dataset. It is possible for the sample size for the number of journeys by individual purpose to be greater than these because, where a respondent has stated the frequency for one purpose but not for another (although time and distance is stated for that purpose), the aggregate number of journeys is treated as unknown, and these respondents are ignored in the calculation of means across all journeys purposes to reduce the estimation error. We recognised this causes a higher level of attrition than is reflected in the other sections of these Appendices, and hence, have not relied on the number of return journeys made by respondents as a key metric in our analysis (see further below also).

Overall, we find an average of just over 10 round trips are made per week per respondent in both the before and after surveys. Of these 34% are journeys to/from work, 31% are for personal business and shopping, 17% are social, 10% are in the course of business and 8% are for education in the before survey. This compares to 37% for work, 30% personal business/shopping, 16% social, 10% business and 7% education in the after survey, i.e. there is a minor increase in the proportions for work, and a slight decrease in the percentages for personal business, social and education between the two surveys.

We find that a total of 26,519 round trips were made in the before survey, and 22,877 in the after survey, when the treatment and control areas are aggregated individually (Tables A2.1a and A2.1b).

However, in order to provide like-for-like comparisons between the (five) treatment and (three) control areas year-on-year, we have adjusted the round trip calculations for the aggregated control group so that each set of matched areas has equal weight, i.e. the trips and sample sizes for Wigan and Fareham have been double counted so that Rochdale vs Wigan and Tameside vs Wigan (for example) have the same comparable weight as Coalville vs Hinckley. Applying this method, which did not produce significantly different mean trips to averaging across the three control areas individually, shows that there are over 16,000 trips for our treatment areas and over 17,100 (adjusted) trips for the control areas in the before survey, and over 14,150 and 14,200 trips respectively in the after survey - see Table A2.1c.

Table A2.1c: Comparison of Trips in Treatment/Control Areas by Purpose - Before/After Surveys

	BEFORE SURVEY						AFTER SURVEY					
Frequency of Journeys* (Excludes Unknown/Not stated)	**Treatment Areas**		**Control Areas****		**Difference**		**Treatment Areas**		**Control Areas****		**Difference**	
To/from Work												
Number of journeys=	5,711	36%	5,348	31%		4.5%	5,290	37%	5,260	37%		0.3%
Mean	3.3		3.1		0.2		2.9		2.8		0.1	
N*=	1,730		1,740				1,845		1,904			
In the Course of Business												
Number of journeys=	1,466	9%	1,788	10%		-1.3%	1,338	9%	1,333	9%		0.1%
Mean	0.8		1.0		-0.1		0.7		0.7		0.0	
N*=	1,736		1,802				1,787		1,837			
For Education/Study												
Number of journeys=	1,301	8%	1,263	7%		0.8%	1,040	7%	931	7%		0.8%
Mean	0.7		0.7		0.1		0.6		0.5		0.1	
N*=	1,773		1,855				1,853		1,903			
For Personal Business and Shopping												
Number of journeys=	4,703	29%	5,827	34%		-4.6%	4,164	29%	4,391	31%		-1.5%
Mean	3.4		4.1		-0.7		3.4		3.5		-0.1	
N*=	1,398		1,427				1,235		1,264			
For Social/Visiting												
Number of journeys=	2,835	18%	2,918	17%		0.7%	2,328	16%	2,287	16%		0.3%
Mean	2.1		2.1		0.0		1.8		1.8		0.0	
N*=	1,361		1,415				1,284		1,252			
Across All Purposes***												
Total number of journeys=	16,016	100%	17,145	100%			14,159	100%	14,202	100%		
Mean	10.1		10.6		-0.5		10.1		10.1		0.0	
N*** (Sample Size)=	1,590		1,619				1,402		1,412			

* Age weighting applied, with travel frequencies rounded to nearest integer. Includes cases where the journey frequency is zero, but not where the travel diary section has been left blank or the respondent's age is unknown.

** Note that values for the Control Areas have been adjusted to provide parity for comparison with their corresponding (five) Treatment Areas, i.e. Wigan and Fareham are double weighted.

*** Journeys where at least one trip is made, i.e. excludes cases where the frequency of journeys for ALL purposes are either zero, unknown or not stated.
Note: the number of observations varies by journey purpose, and across all purposes. Where a respondent has stated the frequency for one purpose but not another (where a trip is also made for that purpose), the aggregate is treated as unknown, and the record excluded from the mean calculation across all purposes.

Table A2.1c also shows that the distribution in the percentage of journeys for the different purposes is broadly similar between the aggregated treatment and control areas, particularly for the after survey. However there is a higher percentage of work journeys, and a lower proportion of personal business/shopping journeys in the treatment areas as compared to control in the before survey, and a similar but much smaller trend in the after survey. Where differences between the mean trips do exist, for both the before and after surveys, the variation in the average number of journeys conducted for each purpose between the treatment and control areas is relatively small (less than 0.75 trips).

We find that the level of trip making in our sample is broadly comparable with the National Travel Survey (NTS), e.g. comparing 2013 with the before survey (shown in Table A2.1a). However, there are notable differences in terms of journey purpose and mode splits. A greater percentage of the trips in our sample are for work purposes than in the NTS (34% compared to 16%) and for business (10% compared to 3%). Conversely, we have a lower percentage of education trips in our sample (8% compared to 12%) as well as shopping and personal business trips (31% compared to 39%) and social trips (17% compared to 30%).

Table A2.1c also shows that, for the treatment areas, the mean number of trips remains constant at 10.1 round trips per week. However, for the control areas, the mean number of round trips per week decreases from 10.6 in the before situation to 10.1 in the after situation. For both types of areas, the phenomenon of journeys to/from work becoming a larger proportion of all trips is observed, with this being particularly marked in the control areas.

Given issues with non-reporting for the trip metric, our focus is on the amount of weekly travel in terms of time and distance. Table A2.2a and A2.2b shows the breakdown of journeys by mode (for all purposes) in the eight individual treatment/control areas, including the mean time and distance for each mode for the before and after surveys respectively. Note that the size of these time or distance datasets varies by Journey purpose. Overall, across all purposes, the maximum size of these datasets are 3,429 for the before survey, and 3,443 for the after, as 16 of the original 3,445 matched respondents did not provide any travel diary data in the before survey, and 2 in the after, although they provided travel awareness and other survey data (car ownership, etc.). These slight differences do not make a material difference in assessing total change but might do so for individual areas. It should also be noted that these sample sizes differ from the number of observations used to calculate the 'Mean Journeys', which are also given in these Tables (N=2,574 and 2,266 respectively, as before), and hence the 'Average Mean Time (or Distance) per Mean Journey' shown is only an approximation.

Table A2.2a: Journeys by Mode (All Purposes) across Treatment/Control Areas - Before Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	9.6		10.3		11.3		9.4		11.1		10.6		10.2		10.0		10.3		Hours
Mean Walking Time (mins)	105	21%	106	17%	152	27%	102	18%	100	16%	100	17%	92	15%	112	17%	105	17%	1.7
Mean Cycling Time (mins)	5	1%	5	1%	6	1%	7	1%	14	2%	12	2%	15	2%	46	7%	16	3%	0.3
Mean Bus Time (mins)	55	11%	69	11%	33	6%	31	5%	21	3%	32	5%	19	3%	31	5%	35	6%	0.6
Mean Train Time (mins)	25	5%	38	6%	33	6%	7	1%	33	5%	32	6%	32	5%	19	3%	28	5%	0.5
Mean Drive Time (mins)	222	46%	329	53%	261	47%	332	58%	384	60%	321	56%	389	61%	371	55%	338	56%	5.6
Mean Passenger Time (mins)	58	12%	50	8%	50	9%	57	10%	72	11%	57	10%	65	10%	51	8%	58	10%	1.0
Mean Other Time (mins)	18	4%	29	5%	22	4%	38	7%	15	2%	24	4%	20	3%	42	6%	26	4%	0.4
Total Mean Times - All Modes (mins)	488	100%	625	100%	557	100%	574	100%	638	100%	579	100%	633	100%	673	100%	605	100%	10.1
Avg Mean Time per Mean Journey (mins)	51		60		49		61		58		54		62		67		59		Mean Speed
Mean Walking Distance (miles)	4	3%	4	2%	7	5%	4	2%	4	2%	5	2%	5	2%	5	3%	5	2%	2.6
Mean Cycling Distance (miles)	1	0%	1	0%	1	0%	1	1%	2	1%	2	1%	3	1%	6	3%	2	1%	8.5
Mean Bus Distance (miles)	8	6%	6	3%	4	3%	7	3%	4	2%	5	2%	5	2%	4	2%	5	3%	9.0
Mean Train Distance (miles)	19	14%	18	10%	21	13%	6	3%	23	9%	22	10%	24	10%	11	6%	18	9%	39.8
Mean Drive Distance (miles)	72	53%	113	61%	99	64%	132	67%	170	68%	128	61%	159	66%	125	66%	130	64%	23.1
Mean Passenger Distance (miles)	18	13%	17	9%	14	9%	18	9%	32	13%	21	10%	28	12%	17	9%	22	11%	22.4
Mean Other Distance (miles)	13	9%	26	14%	9	6%	30	15%	13	5%	26	12%	17	7%	22	12%	20	10%	46.1
Total Mean Distances - All Modes	135	100%	184	100%	154	100%	198	100%	249	100%	209	100%	240	100%	190	100%	202	100%	20.1
Avg Mean Distance per Mean Journey (miles)	14		18		14		21		23		20		23		19		20		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
% Sustainable Travel	**24.2%**		**15.2%**		**21.1%**		**9.0%**		**13.5%**		**16.3%**		**15.1%**		**13.4%**		**15.0%**		

Table A2.2b: Journeys by Mode (All Purposes) across Treatment/Control Areas - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	10.6		9.6		10.3		9.8		10.2		10.8		9.9		9.7		10.1		Hours
Mean Walking Time (mins)	94	19%	104	18%	146	24%	91	16%	91	15%	92	16%	87	14%	89	15%	96	16%	1.6
Mean Cycling Time (mins)	5	1%	12	2%	14	2%	9	2%	13	2%	13	2%	13	2%	40	7%	16	3%	0.3
Mean Bus Time (mins)	41	8%	51	9%	36	6%	22	4%	14	2%	28	5%	15	2%	44	7%	30	5%	0.5
Mean Train Time (mins)	21	4%	29	5%	44	7%	4	1%	20	3%	35	6%	41	7%	16	3%	27	5%	0.4
Mean Drive Time (mins)	248	50%	327	56%	304	49%	341	61%	379	63%	332	57%	379	61%	321	53%	336	57%	5.6
Mean Passenger Time (mins)	71	14%	51	9%	53	9%	62	11%	61	10%	47	8%	61	10%	61	10%	58	10%	1.0
Mean Other Time (mins)	21	4%	11	2%	18	3%	29	5%	27	4%	31	5%	26	4%	34	6%	25	4%	0.4
Total Mean Times - All Modes (mins)	501	100%	584	100%	615	100%	557	100%	604	100%	578	100%	622	100%	606	100%	587	100%	9.8
Avg Mean Time per Mean Journey (mins)	47		61		60		57		59		53		63		63		58		Mean Speed
Mean Walking Distance (miles)	4	3%	4	3%	7	4%	3	2%	4	2%	4	2%	4	2%	4	2%	4	2%	2.6
Mean Cycling Distance (miles)	0	0%	2	1%	1	1%	1	1%	2	1%	2	1%	2	1%	5	3%	2	1%	8.9
Mean Bus Distance (miles)	5	4%	6	4%	5	3%	5	3%	2	1%	4	2%	3	1%	8	4%	5	2%	9.3
Mean Train Distance (miles)	8	6%	15	9%	27	16%	3	2%	15	7%	31	15%	28	11%	10	5%	18	9%	40.4
Mean Drive Distance (miles)	76	59%	110	69%	106	64%	129	71%	161	74%	135	64%	168	65%	107	53%	129	65%	23.1
Mean Passenger Distance (miles)	24	19%	18	12%	17	10%	23	13%	22	10%	19	9%	25	10%	20	10%	21	11%	22.0
Mean Other Distance (miles)	10	8%	4	3%	3	2%	16	9%	12	5%	14	7%	28	11%	48	24%	19	10%	45.4
Total Mean Distances - All Modes	128	100%	160	100%	166	100%	181	100%	218	100%	211	100%	258	100%	202	100%	199	100%	20.3
Avg Mean Distance per Mean Journey (miles)	12		17		16		18		21		19		26		21		20		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
% Sustainable Travel	**13.6%**		**17.0%**		**23.7%**		**7.1%**		**10.4%**		**20.0%**		**14.5%**		**13.5%**		**14.6%**		

Our key measure is travel distance. Overall we find the mean round trip distance to be approximately 20 miles in both the before and after surveys, with the longest trips in Fareham and Hinckley, and the shortest in Rochdale. Across both surveys, we find overall that 64-5% of travel is by car driver, 11% by car passenger, 10% by other modes (including aviation), 9% by train, 2-3% by bus, 2% by walking and 1% by cycling. If sustainable transport is defined as active travel (walking and cycling) and public transport, then only 15% of travel is by sustainable transport in both surveys, albeit with a very slight decrease overall before and after. For the before survey, we find the highest car driver share in Hinckley and Coalville (68% and 67% respectively), car passenger share in Rochdale (over 13%), other modes share (including air travel) in Coalville (15%), Tameside (14%), Eastleigh and Gosport (both 12%, and including ferry), train share in Rochdale and Wigan (14% and 13% respectively), bus share in Rochdale (6%), walking share in Wigan (5%) and cycling share in Gosport (3%). For the after survey, car driver share remain highest in Hinckley and Coalville (74 and 71%), car passenger share in Rochdale (19%), train share in Wigan (16%), bus share in Rochdale (joined by Tameside and Gosport on 4%), walking share in Wigan (4%), and cycling share in Gosport (3%). The other share, which includes ferry, is now highest in Gosport (24%).

Given that we collect data on travel distance and travel time, we are able to compute mean travel speeds (including waiting time for public transport), which in the case of sustainable transport range from 3 miles per hour (walking) to 40 miles per hour (train) in both surveys. The speeds for other travel is higher, when including air travel, although generally there are no significant differences between the mean mode speeds in the before and after surveys overall. Having said this, Table A2.2c shows the overall change in mean time and distance travelled across the aggregated treatment and control areas in the before and after surveys. Again, a double weighting has been applied to Wigan and Fareham for the aggregated control group to provide like-for-like comparisons with the aggregate of treatment areas.

Table A2.2c: Total Changes in Mean Travel Times (minutes) and Distances (miles) per Week

	BEFORE SURVEY						AFTER SURVEY						OVERALL CHANGE			
	Treatment Areas		Control Areas**		Difference		Treatment Areas		Control Areas**		Difference		Treatment Areas		Control Areas	
Mean journeys (excl. Unknown/not stated)*	10.1		10.6				10.1		10.1				0.0		-0.5	
Mean Walking Time (mins)	105	18%	106	17%	-1	1%	94	16%	100	16%	-6	0%	-11.2	-1.2%	-5.8	-0.9%
Mean Cycling Time (mins)	17	3%	13	2%	4	1%	17	3%	13	2%	4	1%	0.1	0.1%	0.0	0.0%
Mean Bus Time (mins)	42	7%	22	4%	20	3%	37	7%	19	3%	18	3%	-5.1	-0.6%	-3.0	-0.5%
Mean Train Time (mins)	25	4%	32	5%	-8	-1%	22	4%	37	6%	-15	-2%	-3.0	-0.3%	4.7	0.8%
Mean Drive Time (mins)	321	54%	361	58%	-40	-5%	317	56%	363	59%	-47	-3%	-4.3	1.6%	2.0	0.4%
Mean Passenger Time (mins)	55	9%	63	10%	-9	-1%	58	10%	59	10%	-2	0%	3.0	0.9%	-4.0	-0.6%
Mean Other Time (mins)	31	5%	19	3%	11	2%	26	5%	24	4%	2	1%	-5.0	-0.6%	4.9	0.8%
Total Mean Times - All Modes (mins)	596	100%	618	100%	-23		570	100%	617	100%	-47		-25.3	-4.3%	-1.3	-0.2%
Avg Mean Time per Mean Journey (mins)	59		58		1		56		61		-5		-2.7		3.0	
Mean Walking Distance (miles)	4	2%	5	2%	-1	0%	4	2%	5	2%	-1	0%	-0.4	-0.2%	-0.6	-0.3%
Mean Cycling Distance (miles)	2	1%	2	1%	0	0%	3	1%	2	1%	1	1%	0.2	0.1%	0.0	0.0%
Mean Bus Distance (miles)	6	3%	5	2%	1	1%	6	3%	3	1%	3	2%	0.1	0.2%	-1.5	-0.7%
Mean Train Distance (miles)	15	8%	23	10%	-8	-2%	14	8%	25	11%	-11	-3%	-0.8	-0.2%	1.9	0.5%
Mean Drive Distance (miles)	116	63%	149	66%	-32	-4%	113	63%	154	67%	-41	-4%	-3.1	0.1%	5.3	0.5%
Mean Passenger Distance (miles)	18	10%	26	12%	-8	-2%	21	11%	23	10%	-2	2%	2.4	1.6%	-3.7	-1.9%
Mean Other Distance (miles)	24	13%	14	6%	9	6%	20	11%	19	8%	1	3%	-3.7	-1.6%	4.8	1.9%
Total Mean Distances - All Modes	186	100%	224	100%	-38		181	100%	230	100%	-50		-5.3	-2.9%	6.1	2.7%
Avg Mean Distance per Mean Journey (miles)	18		21		-3		18		23		-5		-0.6		1.7	
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																
** Note that values for the Control Areas have been adjusted to provide parity for comparison with their corresponding (five) Treatment Areas, i.e. Wigan and Fareham are double weighted.																
% Sustainable Travel	14.9%		15.6%				14.8%		15.1%				-0.1%		-0.5%	
% Car Driver travel	62.5%		66.3%				62.7%		66.9%				0.1%		0.5%	
%All Other Travel	22.6%		18.1%				22.5%		18.1%				-0.1%		-0.0%	

We find that there are reductions in the mean time spent travelling per week in both the treatment areas (down 4.3%) and the control areas (down 0.2%). We also find there are modest reductions in the distance travelled per week in the treatment areas (down 2.9%, or approximately 5 miles per person per week). However, the distance travelled in the control areas has increased (up 2.7%, or over 6 miles per person per week). These trends may be indicative of some effects from the LSTF schemes, but could also be due to external factors (such as the substitution of physical travel by virtual activity in the treatment areas) or the ageing of the panel itself - although this would mean these factors were having slightly different effects between the treatment and control areas.

In terms of the mean distances travelled, it can be seen that for the treatment areas travel is broadly constant but with slight reduction in the proportions for walking, train and other travel volumes and slight increases in bus, cycling, car driver and passenger travel volumes. For the control areas, there are reductions in mean travel distances for walking, bus and car passengers. Cycling distances have remained constant, but train, car driving and other travel has increased.

If we calculate modal splits based on mean distances travelled, we find that car driving in the treatment areas has a very minor increase (62.5% in the before survey, 62.7% in the after survey), whereas there is a higher increase for the control areas (from 66.3% to 66.9%). Superficially this might suggest that the treatment areas have avoided a car driving modal shift of around 0.4 percentage points. Similarly (bottom of Table A2.2c), if we again define walking, cycling, bus and train as sustainable travel modes, we see that there has been little change in the mode split in the treatment areas, but a 0.5% decrease in the control areas. This suggests some evidence of mode split trends going in the intended direction, i.e. car driving decreasing in the treatment areas relative to control areas, while sustainable travel is being maintained in the treatment areas but decreasing in the control areas. However, these findings do not seem to indicate the degree of modal shift anticipated by the LSTF and much of the change could be related to trip suppression in the treatment areas relative to the control areas.

We also calculated the mean car driving speeds between the aggregate treatment and control areas using the mean travel times and distances as given in Table A2.2c (see Table 2.3). Car driving speeds can be a determinant of both congestion and carbon emissions, and Table A2.3 shows while overall car driving speeds have remained roughly constant, they have slightly decreased in the treatment areas whilst they slightly increased in the control areas, even though car driving by those surveyed has increased in the control areas relative to the treatment areas. This suggests there may be further external factors to the LSTF interventions affecting the results, such as that congestion in the treatment areas is acting as a trip suppressant, as driving speeds are lower there than in the control areas, where both mean speeds and car driver distances have increased. This might also indicate that there is more spare road capacity in the control areas (where mean speeds are higher and increasing) than in the treatment areas.

Table A2.3: Change in Car Driver Speeds (miles per hour)

	BEFORE SURVEY			AFTER SURVEY			OVERALL CHANGE	
	Treatment Areas	Control Areas	Difference	Treatment Areas	Control Areas	Difference	Treatment Areas	Control Areas
Mean Car Driver Speed (mph)	21.8	24.7	-2.9	21.5	25.4	-4.0	-0.3	0.7

More detailed breakdowns of the change in means between the before and after surveys using our key metric of travel distance by individual treatment and their corresponding control areas are given in Table A2.4. If we are looking for increases in travel distances in sustainable travel modes and reductions for driving, there is very little such change in percentage terms for the treatment areas, with perhaps the most notable exceptions being the significant increase in train use of 9 miles per person per week in Eastleigh and a reduction in car driver miles per person per week of 18 in Gosport, although the latter is not statistically significant relatively, and the former only has partial significance (at the 10% level, paired samples t-test). There seems to be more variation in the volumes of travel by car passenger and by other modes. It should be noted that the increase in other travel modes in Gosport (up 26 miles per person per week, although again not statistically significant) could be partly related to the Go Solent travel card integrating bus and ferry tickets (although the ferry crossing is less than a mile).

Table A2.4: Changes in Mean Travel Distances (miles) per Week by Area

		Treatment Areas				Control Area		Treatment Area		Control Area		Treatment Areas				Control Area	
		Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Gosport		Fareham	
		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)		Change in Means/Mode % (After - Before)	
		Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%
Walking	distance per week	0	0%	0	0%	0	-1%	0	0%	0	0%	0	0%	-1	-1%	-1	0%
Cycling	distance per week	0	0%	2	1%	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Bus	distance per week	-4	-2%	1	1%	1	0%	-2	-1%	-2	-1%	-1	0%	4	2%	-2	-1%
Train	distance per week	-11	-8%	-3	-1%	6	3%	-3	-1%	-8	-3%	9	4%	-1	-1%	4	1%
Car Driver	distance per week	4	6%	-2	8%	8	0%	-3	4%	-8	6%	7	3%	-18	-13%	10	-1%
Car Passenger	distance per week	6	6%	1	2%	3	1%	5	4%	-10	-3%	-2	-1%	3	1%	-4	-2%
Other	distance per week	-2	-1%	-22	-12%	-5	-4%	-14	-6%	-1	0%	-12	-6%	26	12%	11	4%
Total	**distance per week**	-7	-5%	-24	-13%	12	8%	-17	-9%	-31	-12%	2	1%	13	7%	18	7%
% Change in sustainable travel			-11%		2%		3%		-2%		-3%		4%		0%		-1%

Note: Subject to rounding error.

The Mode % shown is the difference between the before and after % mode shares (this accounts for the difference in sample sizes across the different areas, and in the before/after surveys).

Note that the percentage change in means shown in Table A2.4 is for the difference in the before and after percentage mode shares, which account for the variation in sample sizes between the different areas, and between the before and after surveys.

The differences are summarised in Table A2.5, where we use the difference-in-differences method (DiD) to produce some further results. This is computed for each mode as:

DiD = Δ Treatment Area – Δ Control Area.

Where Δ = Change in the **mean** distance travelled per person per week (After minus Before Survey), i.e. the year-on-year change in mean distance travelled.

Note that this computation can result in small rounding errors due to the differences in sample sizes between the before and after surveys.

Table A2.5: Difference-in-Differences of Weekly Travel Distance by Mode (miles) - Treatment Areas compared to relevant Control Area (Note: subject to rounding)

	Walk	Cycle	Bus	Train	Car Driver	Car Passenger	Other	Total
Rochdale	0	-1	-4	-17	-4	+4	+3	-19
Tameside	0	+1	0	-9	-10	-2	-17	-36
Coalville	0	0	0	+5	+4	+15*	-13	+12
Eastleigh	0	0	+1*	+5	-2	+2	-22	-15
Gosport	0	0	+6	-5	-27	+7	+15	-5

* Indicates change is statistically significant at the 5% level (Mann-Whitney U-test).

Although only two of the changes in this Table are statistically significant, it is worth commenting on the findings. Compared to Wigan, it can be seen that both Rochdale and Tameside have reductions in car driving but also in train travel and, in Tameside, use of other modes (which might be related to the novelty effect of the Ashton Metrolink in the before situation). The treatment areas in Greater

Manchester exhibit bigger reductions in travel overall compared to Wigan, which may indicate trip suppression being a factor here. The reductions in rail use in Rochdale may in part be related to the re-development of Manchester Victoria station (as part of the Northern Hub scheme) and disruptions to the Metrolink services in central Manchester. It can also be attributed (from the focus group feedback - see section A2.7 below) to issues of access, including parking at stations, and problems with overcrowding and the poor condition of the rail rolling stock.

In Coalville, compared to Hinckley, there have been increases in train, car driver and passenger travel. Given there is no train station in Coalville itself, this suggests there is no evidence of the LSTF measures having their intended effect. However, it is also possible they had already had an effect by the time of the before survey, as some schemes started prior to November 2013 (i.e. the time of the before survey), and there were already slightly higher (but nevertheless significant) levels of awareness of these schemes in Coalville at the outset (see Appendix A4.3 below). It should also be noted that Hinckley became a recipient of LSTF funding in 2015/16, which is reflected in a higher level of awareness of such schemes among the respondents in the after survey (see Table A4.7 below), and this may have reduced the significance of any year-on-year changes between the two areas. The significant increase in car passenger travel in Coalville might be ascribed to the LSTF as there were a number of Workplace Travel Schemes that encouraged lift sharing and this was commented upon in the focus groups. However, subsequent analysis found that the increase in car passenger travel occurred amongst those who were least aware of the LSTF measures (see section A4.4 below).

The treatment areas in South Hampshire show trends that are most consistently in line with the expectations of the LSTF, with modest increases in sustainable travel (except for train in Gosport - although note that the Go Solent card may have encouraged some switching from train to bus) and decreases in car driving relative to the control area of west Fareham. Improved Interchange at both Eastleigh and Southampton Airport Parkway stations as a result of LSTF initiatives could have promoted rail use in Eastleigh, as well as sustaining local bus use compared to Fareham, where it has fallen (and this increase in bus use is statistically significant). The distance travelled by train for Eastleigh has also increased over that of Fareham (Table A2.5 above), although this effect is not significant, and it is difficult to attribute specific effects to the LSTF schemes at the population level. These difference-in-difference comparisons are discussed further in Appendix A2.7

Overall, we can see that in four of the treatment areas, the total level of travel has reduced relative to their control areas, with the exception provided by Coalville. Using the difference-in-differences approach, it could be inferred from Table A2.2c that there has been a reduction in car driving of around 8.4 miles per person per week in the treatment areas compared to the control areas, i.e. a 3.1 mile reduction year-on-year in the treatment areas versus a 5.3 mile increase in the control areas. This reduction represents a 7% change to the before level of car driving in the treatment areas, which is similar to that found by other studies - for example the Sloman et al. (2010) review of the Sustainable Travel Towns found traffic reductions of around 5 to 7%. However, this change is not found to be statistically significant and cannot be directly ascribed to LSTF measures. As we have already seen, the level of car driving reduction in our case study represents only a difference-in-difference change of 0.4% in terms of the percentage mode share (again as inferred from Table A2.2c). Moreover, in our case study the change in car driving seems more related to trip suppression than modal shift.

We find that walking and cycling levels in the control areas fell by 0.2 miles per person per week more than in the treatment areas (inferred from Table A2.2c above). There were also reductions in bus and car passenger travel (of 1.5 and 3.7 miles per person per week respectively) in the control areas. This compares to year-on-year increases in bus and car passenger use in the treatment areas (of 0.1 and 2.4 miles respectively). In addition to the reductions in car driving between the treatment and control areas year-on-year, there have also been reductions in the use of other modes (also down 8.4 miles per person per week) and train (down 2.7 miles per week). Total travel in the treatment areas has also decreased by over 11 miles per person per week compared to the control areas. The LSTF measures were designed to encourage more use of sustainable travel modes, namely active travel and public transport, in the treatment areas. However, the usage of these modes decreased by 0.7 miles per person per week, largely due to decreases in rail (and tram) usage in Rochdale and Tameside (as discussed further above), as compared to increases in Wigan (see Table A2.4). However, if car passenger is included in the definition, sustainable travel would increase by 5.4 miles per week - some 64% of the reduction in car driving distance, and the mean distances travelled by walking, cycling and bus have all increased or were reduced by a lesser extent in the treatment areas compared to the control areas.

In the next sections (A2.2 to A2.6), we report for completeness the weighted mean times and distances by mode across the eight treatment/control areas for the five travel purposes, i.e. for work/commuting, in the course of business, education/study, shopping/personal business and visiting/social/leisure respectively, focusing on the after survey, and comparing any changes in the proportions of sustainable travel with the before survey.

It should be noted these Tables also show a 'Total Mean Time' (or Distance) across 'All Modes', which are an aggregate of the mean travel times or distances for each mode. The 'Mean Speed' is then computed as the mean distance over mean time for each mode, and across all modes. This is distinct from the 'Avg' (average) Mean Time or Distance per Mean Journey shown, which is taken from the total mean time (or distance) across all modes, divided by the mean number of journeys shown at the top of the tables, i.e. these values are indicative only, as it is assumed that the 'Mean Journeys' are representative of the associated sample as a whole, although in practice not all respondents who have completed the travel time or distance entries for each purpose will also have stated the number of journeys undertaken. This could be because they do not have a regular travel pattern, e.g. they are part-time or mobile workers, or some trip-chaining also occurs where respondents are unsure what their primary travel purpose is, so the 'Mean Journeys' shown is an approximation (as this is based only on known valid record entries) for all those who have recorded any travel time and/or distance by purpose (but not necessarily all the trip frequencies), and therefore the average mean time (or distance) per mean journey is an estimate only. Also, these average values are not shown where the mean number of journeys is less than one, e.g. in the case of some journeys for business and education purposes. Hence our key metric for the primary data analysis is the distance travelled and the mode splits, rather than the number of return trips.

A2.2 Work Journeys

Table A2.6 shows the breakdown of work journeys by mode for the after survey. From this table, we can see that 74% of the mean distance travelled overall is made by car driver, 6% by car passenger, 4% by other, 12% by train, 1% by bus, 2% by cycling and 1% by walking. The share for sustainable transport modes is thus 16%. This is identical to the percentage reported previously for the before survey, and in fact there is very little year-on-year change in the proportions of sustainable travel across all the different areas.

Table A2.6: Work Journeys by Mode across the Treatment/Control Areas (Weighted) - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	2.5		2.7		2.5		3.0		2.8		3.2		2.8		2.9		2.8		
																			Hours
Mean Walking Time (mins)	22	13%	24	12%	47	21%	12	6%	14	7%	20	11%	12	6%	14	8%	18	10%	0.3
Mean Cycling Time (mins)	4	2%	8	4%	9	4%	7	4%	2	1%	7	3%	6	3%	19	11%	8	4%	0.1
Mean Bus Time (mins)	13	8%	16	8%	8	4%	6	3%	6	3%	7	3%	3	1%	5	3%	7	4%	0.1
Mean Train Time (mins)	10	6%	12	6%	24	11%	1	1%	12	6%	18	9%	22	11%	6	3%	13	7%	0.2
Mean Drive Time (mins)	98	58%	133	65%	122	56%	158	82%	153	75%	132	69%	134	70%	117	68%	132	69%	2.2
Mean Passenger Time (mins)	20	12%	9	5%	8	4%	7	4%	12	6%	6	3%	12	6%	7	4%	10	5%	0.2
Mean Other Time (mins)	2	1%	3	2%	1	0%	1	1%	6	3%	3	2%	4	2%	5	3%	3	2%	0.1
Total Mean Times - All Modes (mins)	168	100%	205	100%	218	100%	191	100%	204	100%	193	100%	193	100%	173	100%	192	100%	3.2
Avg Mean Time per Mean Journey (mins)	68		76		87		65		72		61		68		60		68		Mean Speed
Mean Walking Distance (miles)	1	3%	1	1%	2	3%	1	1%	1	1%	1	1%	1	1%	1	1%	1	1%	3.0
Mean Cycling Distance (miles)	0	1%	2	2%	0	1%	1	2%	0	0%	1	1%	1	1%	3	5%	1	2%	10.2
Mean Bus Distance (miles)	2	4%	2	3%	1	2%	1	2%	1	1%	1	1%	1	1%	1	1%	1	1%	8.7
Mean Train Distance (miles)	2	5%	7	11%	13	19%	1	1%	8	9%	17	21%	16	18%	4	6%	9	12%	41.9
Mean Drive Distance (miles)	32	70%	50	74%	47	69%	66	91%	77	83%	60	71%	62	67%	42	66%	56	74%	25.4
Mean Passenger Distance (miles)	6	14%	5	7%	4	6%	3	4%	5	5%	2	3%	6	7%	3	4%	4	6%	25.3
Mean Other Distance (miles)	1	3%	1	2%	0	0%	0	1%	2	2%	2	2%	6	6%	10	16%	3	4%	59.1
Total Mean Distances - All Modes	46	100%	68	100%	68	100%	73	100%	93	100%	85	100%	92	100%	63	100%	76	100%	23.8
Avg Mean Distance per Mean Journey (miles)	19		25		27		25		33		27		33		21.8		27		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
Change in (After - Before Survey):																			
% Sustainable Travel	-0.1		-0.0		0.0		-0.0		-0.1		0.0		0.0		-0.1		-0.0		
% Other Travel	0.1		0.0		-0.0		0.0		0.1		-0.0		-0.0		0.1		0.0		

A2.3 Business Journeys

Similarly, Table A2.7 shows the breakdown of the business journeys travelled by mode in the after survey, with 60% of the overall mean distance travelled being made by car driver, 6% by car passenger, 23% by other (including aviation), 8% by train, 2% by bus and less than 1% for walking and cycling. The sustainable transport share is thus around 10% overall, although again there is very little change compared to the proportions from the before survey across the different areas and overall.

Table A2.7: Journeys for Business by Mode across the Treatment/Control Areas (Weighted) - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	0.7		0.7		0.8		0.9		0.9		0.7		0.6		0.7		0.8		
																			Hours
Mean Walking Time (mins)	8	10%	6	6%	22	16%	7	6%	5	4%	5	5%	6	5%	4	3%	7	6%	0.1
Mean Cycling Time (mins)	0	0%	0	0%	1	0%	0	0%	3	2%	0	0%	0	0%	1	1%	1	1%	0.0
Mean Bus Time (mins)	1	2%	1	1%	3	2%	0	0%	0	0%	2	2%	0	0%	18	12%	3	3%	0.1
Mean Train Time (mins)	3	4%	1	2%	2	1%	1	1%	4	3%	9	8%	8	7%	5	3%	5	4%	0.1
Mean Drive Time (mins)	38	50%	73	78%	79	57%	75	58%	85	65%	63	55%	78	68%	85	56%	73	61%	1.2
Mean Passenger Time (mins)	8	11%	8	8%	13	9%	16	13%	12	9%	5	4%	5	4%	13	9%	9	8%	0.2
Mean Other Time (mins)	17	23%	6	6%	18	13%	30	23%	21	16%	30	26%	18	16%	25	17%	21	18%	0.3
Total Mean Times - All Modes (mins)	75	100%	94	100%	138	100%	130	100%	131	100%	113	100%	115	100%	150	100%	119	100%	2.0
Avg Mean Time per Mean Journey (mins)	106		136		182		137		142		158		179		212		158		Mean
																			Speed
Mean Walking Distance (miles)	0	1%	0	1%	1	2%	0	0%	0	1%	0	0%	0	0%	0	0%	0	0%	2.0
Mean Cycling Distance (miles)	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	5.6
Mean Bus Distance (miles)	0	0%	0	0%	0	1%	0	0%	0	0%	0	1%	0	0%	5	9%	1	2%	16.1
Mean Train Distance (miles)	2	8%	1	2%	2	6%	1	2%	4	8%	6	13%	6	10%	4	7%	4	8%	47.9
Mean Drive Distance (miles)	9	41%	27	84%	30	75%	23	51%	35	65%	24	51%	40	64%	28	52%	28	60%	23.2
Mean Passenger Distance (miles)	2	8%	1	4%	3	8%	4	10%	3	6%	3	6%	3	5%	4	7%	3	6%	18.8
Mean Other Distance (miles)	9	42%	3	8%	3	8%	17	37%	11	20%	14	29%	13	20%	13	24%	11	23%	31.6
Total Mean Distances - All Modes	22	100%	32	100%	40	100%	45	100%	53	100%	48	100%	62	100%	55	100%	47	100%	23.8
Avg Mean Distance per Mean Journey (miles)	31		46		53		48		58		67		97		77.0		63		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
Change in (After - Before Survey):																			
% Sustainable Travel	-0.0		-0.1		-0.0		-0.0		-0.0		0.0		0.0		0.1		0.0		
% Other Travel	0.0		0.1		0.0		0.0		0.0		-0.0		-0.0		-0.1		-0.0		

A2.4 Education Journeys

Table A2.8 shows that for the overall mean distances travelled for education in the after survey, 49% is by car driver, 4% by car passenger, 31% by train, 6% by bus, 8% by walking and 1% by cycling. Sustainable transport modes therefore have a 46% share overall, the highest among the different journey purposes, although again there is little change in the proportions compared to the before survey.

Table A2.8: Study Journeys by Mode across the Treatment/Control Areas (Weighted) - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	0.6		0.5		0.1		0.4		0.5		0.7		0.6		0.6		0.5		
																			Hours
Mean Walking Time (mins)	5	23%	14	50%	5	27%	7	53%	5	36%	11	39%	7	35%	5	25%	8	36%	0.1
Mean Cycling Time (mins)	0	0%	1	3%	0	2%	0	0%	0	2%	0	0%	0	1%	2	11%	1	3%	0.0
Mean Bus Time (mins)	5	24%	5	20%	3	19%	0	2%	0	0%	4	15%	0	1%	2	11%	2	11%	0.0
Mean Train Time (mins)	1	4%	2	7%	3	21%	0	0%	0	0%	4	15%	2	10%	2	7%	2	8%	0.0
Mean Drive Time (mins)	8	36%	5	17%	5	29%	5	40%	9	61%	8	28%	10	49%	8	35%	8	36%	0.1
Mean Passenger Time (mins)	2	9%	1	4%	0	3%	1	5%	0	1%	1	2%	1	3%	2	7%	1	4%	0.0
Mean Other Time (mins)	1	3%	0	0%	0	0%	0	0%	0	1%	0	0%	0	0%	1	4%	0	1%	0.0
Total Mean Times - All Modes (mins)	23	100%	27	100%	17	100%	12	100%	15	100%	27	100%	20	100%	22	100%	21	100%	0.3
Avg Mean Time per Mean Journey (mins)	41		58		124		30		31		42		34		33		39		Mean
																			Speed
Mean Walking Distance (miles)	0	4%	1	13%	0	4%	0	14%	0	11%	1	8%	0	7%	0	7%	0	8%	2.9
Mean Cycling Distance (miles)	0	0%	0	2%	0	2%	0	0%	0	1%	0	0%	0	0%	0	5%	0	1%	6.6
Mean Bus Distance (miles)	0	8%	1	17%	1	10%	0	3%	0	0%	1	6%	0	0%	0	7%	0	6%	7.4
Mean Train Distance (miles)	1	21%	2	38%	3	44%	0	0%	0	0%	5	54%	1	15%	1	23%	1	31%	49.6
Mean Drive Distance (miles)	2	52%	1	23%	3	38%	2	68%	2	86%	3	30%	4	76%	2	51%	2	49%	18.0
Mean Passenger Distance (miles)	0	13%	0	7%	0	2%	0	15%	0	0%	0	2%	0	2%	0	4%	0	4%	13.7
Mean Other Distance (miles)	0	3%	0	0%	0	0%	0	0%	0	2%	0	0%	0	0%	0	3%	0	1%	9.4
Total Mean Distances - All Modes	3	100%	5	100%	7	100%	2	100%	2	100%	8	100%	5	100%	4	100%	5	100%	13.4
Avg Mean Distance per Mean Journey (miles)	6		10		48		5		4		13		8		6.5		9		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
Change in (After - Before Survey):																			
% Sustainable Travel	-0.6		0.3		-0.3		-0.4		-0.1		0.5		-0.1		0.1		-0.1		
% Other Travel	0.6		-0.3		0.3		0.4		0.1		-0.5		0.1		-0.1		0.1		

A2.5 Shopping/Personal Business Journeys

Table A2.9 shows that 61% of the overall mean distance travelled for shopping and personal business is by car driver, 18% is by car passenger, 5% is by other, 6% is by train, 5% by bus and for walking, and 1% is by cycling. The sustainable transport share overall is 16%, and there are negligible differences compared to the proportions for the before survey.

Table A2.9: Personal Journeys by Mode across the Treatment and Control Areas (Weighted) - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	3.4		3.3		3.4		3.2		3.8		3.6		3.4		3.3		3.4		
																			Hours
Mean Walking Time (mins)	37	25%	45	28%	53	32%	34	24%	46	28%	42	28%	38	22%	45	25%	42	26%	0.7
Mean Cycling Time (mins)	2	1%	0	0%	2	1%	2	1%	3	2%	2	1%	4	2%	9	5%	3	2%	0.1
Mean Bus Time (mins)	15	10%	22	13%	18	11%	11	8%	7	4%	12	8%	10	6%	17	9%	13	8%	0.2
Mean Train Time (mins)	5	4%	6	4%	10	6%	0	0%	4	2%	3	2%	6	3%	2	1%	4	3%	0.1
Mean Drive Time (mins)	66	44%	71	43%	64	38%	72	50%	86	51%	72	48%	93	53%	80	44%	78	47%	1.3
Mean Passenger Time (mins)	24	16%	18	11%	20	12%	25	17%	22	13%	20	13%	23	13%	24	14%	22	13%	0.4
Mean Other Time (mins)	2	1%	2	1%	0	0%	0	0%	1	1%	0	0%	2	1%	3	1%	1	1%	0.0
Total Mean Times - All Modes (mins)	150	100%	163	100%	167	100%	143	100%	168	100%	150	100%	176	100%	180	100%	163	100%	2.7
Avg Mean Time per Mean Journey (mins)	44		49		50		44		45		42		52		55		48		Mean
																			Speed
Mean Walking Distance (miles)	1	4%	2	6%	2	8%	1	4%	2	5%	2	6%	2	3%	2	5%	2	5%	2.5
Mean Cycling Distance (miles)	0	0%	0	0%	0	1%	0	0%	0	1%	0	0%	1	1%	1	2%	0	1%	5.9
Mean Bus Distance (miles)	2	6%	2	8%	2	7%	3	8%	1	3%	2	5%	2	3%	2	5%	2	5%	8.2
Mean Train Distance (miles)	2	8%	1	5%	6	17%	0	0%	2	5%	1	4%	4	7%	1	2%	2	6%	30.0
Mean Drive Distance (miles)	18	57%	17	62%	15	49%	22	67%	26	66%	21	64%	31	61%	21	56%	22	61%	17.4
Mean Passenger Distance (miles)	7	23%	5	18%	6	19%	7	22%	7	19%	6	19%	7	14%	6	17%	7	18%	18.1
Mean Other Distance (miles)	0	1%	0	1%	0	0%	0	0%	0	1%	0	0%	5	10%	5	13%	2	5%	87.9
Total Mean Distances - All Modes	31	100%	28	100%	32	100%	34	100%	39	100%	33	100%	50	100%	38	100%	37	100%	13.5
Avg Mean Distance per Mean Journey (miles)	9		8		9		10		10		9		15		11.5		11		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
Change in (After - Before Survey):																			
% Sustainable Travel	-0.0		-0.0		0.1		-0.0		-0.0		-0.0		-0.0		-0.1		-0.0		
% Other Travel	0.0		0.0		-0.1		0.0		0.0		0.0		0.0		0.1		0.0		

A2.6 Social/Leisure Journeys

For mean distance travelled overall in social journeys, Table A2.10 shows that car driving has a 60% share, car passenger 19% share, other has 10%, train 5%, bus and walking both 2% and cycling 1%. Sustainable transport modes thus have an 11% share overall, one of the lowest among the different journey purposes (along with business journeys at 10%), and again, there are no changes in the proportions compared to the before survey.

Table A2.10: Social Journeys by Mode across the Treatment and Control Areas (Weighted) - After Survey

	Rochdale		Tameside		Wigan		Coalville		Hinckley		Eastleigh		Fareham		Gosport		All		
Mean journeys (excl. Unknown/not stated)*	2.1		1.5		1.8		1.7		1.8		2.2		1.8		1.6		1.8		
																			Hours
Mean Walking Time (mins)	27	25%	20	17%	27	25%	36	32%	23	21%	15	14%	26	19%	23	22%	24	21%	0.4
Mean Cycling Time (mins)	0	0%	3	3%	2	2%	1	1%	6	5%	4	4%	3	2%	9	9%	4	3%	0.1
Mean Bus Time (mins)	9	8%	8	7%	7	6%	5	5%	1	1%	4	4%	2	1%	5	5%	5	4%	0.1
Mean Train Time (mins)	3	3%	8	7%	7	6%	2	1%	2	2%	3	3%	5	4%	3	3%	4	3%	0.1
Mean Drive Time (mins)	50	46%	58	50%	50	46%	49	44%	59	55%	64	60%	73	55%	44	42%	57	51%	1.0
Mean Passenger Time (mins)	20	18%	17	15%	15	14%	18	16%	17	16%	17	15%	22	16%	17	16%	18	16%	0.3
Mean Other Time (mins)	1	1%	1	1%	0	0%	1	1%	0	0%	0	0%	4	3%	3	3%	2	1%	0.0
Total Mean Times - All Modes (mins)	110	100%	115	100%	107	100%	111	100%	107	100%	107	100%	133	100%	104	100%	113	100%	1.9
Avg Mean Time per Mean Journey (mins)	53		77		60		67		59		48		72		66		62		Mean
																			Speed
Mean Walking Distance (miles)	1	4%	1	2%	1	5%	1	3%	1	2%	1	2%	1	2%	1	2%	1	2%	2.5
Mean Cycling Distance (miles)	0	0%	1	2%	0	1%	0	0%	1	3%	1	2%	1	1%	1	2%	1	1%	9.3
Mean Bus Distance (miles)	1	3%	2	5%	1	3%	1	4%	0	1%	1	2%	0	1%	0	1%	1	2%	9.8
Mean Train Distance (miles)	1	4%	4	11%	4	14%	2	5%	1	4%	2	5%	2	4%	1	3%	2	5%	34.1
Mean Drive Distance (miles)	19	58%	20	57%	17	61%	23	60%	27	71%	29	71%	37	67%	18	35%	25	60%	26.1
Mean Passenger Distance (miles)	10	30%	8	22%	5	16%	10	27%	7	20%	8	19%	9	16%	8	15%	8	19%	26.9
Mean Other Distance (miles)	0	1%	0	1%	0	0%	0	1%	0	0%	0	0%	5	9%	21	42%	4	10%	163.6
Total Mean Distances - All Modes	32	100%	35	100%	29	100%	38	100%	38	100%	41	100%	55	100%	50	100%	42	100%	22.1
Avg Mean Distance per Mean Journey (miles)	15		23		16		23		21		18		30		32.1		23		(mph)
* Data from all Completed surveys, where the mode travel time/distance is specified as zero or greater, weighted by age.																			
Change in (After - Before Survey):																			
% Sustainable Travel	-0.1		0.1		0.1		0.1		-0.0		-0.0		-0.0		-0.0		0.0		
% Other Travel	0.1		-0.1		-0.1		-0.1		0.0		0.0		0.0		0.0		-0.0		

At first glance, there seems to be very little change overall in the proportions of sustainable travel for the before and after surveys across the different areas in all journey purposes, although there is an increase in bus travel in Gosport compared to Fareham for business and personal purposes.

The general lack of change could in part be due to the LSTF-funded interventions already having some effect when the before travel surveys were conducted. For example, there was a higher level of awareness in the public transport interchange improvements in both Rochdale and Tameside as compared to Wigan in the before survey (see Table A4.6 below). Similarly, the awareness of bus priority measures in Gosport and Eastleigh is higher compared to Fareham, and the awareness of cycling infrastructure schemes in Coalville is higher than Hinckley. It is therefore possible that the extent of any changes in the after surveys could be limited as a consequence, although it should be noted that a higher level of awareness of LSTF-related schemes may not necessarily lead to significant changes in sustainable travel behaviour. Further difference-in-differences comparisons and dosage analyses were therefore conducted to determine the extent of any travel behaviour changes, which is discussed in the next section, and the relationships between increased levels of awareness and that of sustainable travel are discussed further in Appendix A4.3 and A4.4.

A2.7 Difference-in-Differences Comparisons and Dosage Analyses

Table A2.11 summarises the difference-in-differences (DiD) in weekly travel distances by mode, including that for active travel, public transport and sustainable travel overall, as well as in all car use (driving and car passenger), with significant values shown in bold. (Kolmogorov-Smirnov tests were conducted, which indicated that the differences in travel distances were not normally distributed, hence Mann Whitney U-tests were undertaken to test the statistical significance of these results. Relaxing the assumption about non-normality enabled further t-tests to be conducted, although these did not change the significance of the broad findings.)

Table A2.11: Difference-in-Differences of Weekly Travel Distances by Mode (Miles)

Comparing Treatment vs Control Areas						Distance differences, given in Miles
Travel DiD - Treatment vs Control Areas*	Coalville vs Hinckley	Eastleigh vs Fareham	Gosport vs Fareham	Rochdale vs Wigan	Tameside vs Wigan	Aggregate Treatment vs Aggregate Control***
Walking	-0.1	0.4	0.0	0.0	0.3	0.2
Cycling	0.2	0.1	-0.2	-0.8	1.2	0.2
Bus Travel	0.3	**1.3**	6.2	-4.1	0.3	**1.6**
Train Travel	5.2	5.4	-5.2	-17.4	-9.4	-2.7
Car Driving	4.3	-2.3	-27.4	-4.2	-10.6	-8.5
Car Passenger	**15.1**	2.0	6.6	3.7	-1.6	6.1
Other Modes	-12.6	-22.2	15.0	3.4	-16.6	-8.4
Active Travel**	0.1	0.5	-0.2	-0.7	1.5	0.4
Public Transport**	5.5	6.7	1.0	-21.5	-9.1	-1.1
Sustainable Travel**	5.6	7.1	0.9	-22.3	-7.7	-0.7
All Car Travel**	19.3	-0.3	-20.9	-0.6	-12.2	-2.4
All Travel (including Other Modes)	12.4	-15.4	-5.0	-19.5	-36.5	-11.5
* The Difference-in-Differences is calculated as: DiD = Δ Treatment Area(s) – Δ Control Area(s), where Δ = Change in distance travelled per mode per week (After survey minus Before)c						
** 'Active Travel' includes Walking and Cycling; 'Public Transport' includes Bus and Train Travel; 'Sustainable Travel' is the combination of Active Travel and Public Transport, while 'All Car Travel' includes Driving and Car Passengerc						
*** Adjusted to provide like-for-like comparisons between Treatment and Control Areas (Fareham and Wigan are double weighted)c						
Note - Bold indicates statistically-significant difference between the Treatment and its corresponding Control distributions, Mann-Whitney U Test, p<0d05cThe DiD in the means shown may be subject to rounding errorc						

From Table A2.11, it can be seen that there is a small but significantly positive DiD in bus travel in Eastleigh compared to Fareham, which is similarly reflected when comparing the aggregate treatment and control areas (although note the latter is weighted as previously discussed). This is likely to be partly due to the LSTF measures having an effect, as all the sustainable travel modes DiD for Eastleigh showed a net increase in the means, although none of the other results were significant.

c

However, a comparison of the changes in distance travelled shown in Tables A2c2a, A2c2b and A2c4 c above shows that the positive bus DiD is caused by a higher year-on-year drop in such travel in c Fareham, whereas the distance travelled in Eastleigh has only reduced slightly at less than 1 mile c per weekcHence it is also possible that this significant difference was caused by a deterioration in c local bus services in Fareham during 2014, which had been reported by some participants of a focus c group conducted as part of the local Better Bus Area Fund projectcHowever, given that the mean c overall distance travelled in Eastleigh has also remained broadly the same year-on-year (Table A2c4), c while it has increased by more than 7% in Fareham, it is possible that the observed positive bus c difference-in-difference could have been even higher, but for possible trip suppression in Eastleighc c

The other significant difference is in car passenger use for Coalville as compared to Hinckley, which c omprises a year-on-year increase in distance travelled in the treatment area, with a corresponding c decrease in the control area (see Tables A2c2a, A2c2b and A2c4)cThis difference could be due to c several factors locally, including LSTF-promoted car sharing in Coalville, which is offset against a c similar but smaller year-on-year decrease in car driving (see Table 2c4), as well as external drivers c such as relatively high fuel prices and the continued economic downturn during 2014c The year-on-c year decrease in passenger travel for Hinckley is coupled with a similar decrease in car driving, which c while could be indicative of local trip suppression (as discussed in section A2c1 above), could also c suggest that control areas are not immune to Local Sustainable Transport Fund schemes that c develop subsequent to the commencement of this Case Study, which could not have been foreseen c in the original survey designedcc

However, given there are few significant differences between the treatment and control areas c overall, it could be argued that these results reflect a relatively-diffuse data comparison method, c where any distance differences are due to random variation or that the results are subject to 'noise'cc The Department for Transport therefore suggested a proximity or 'dosage' analysis of survey c respondents, through geocoding of their home address to identify their relative distance to the LSTF c interventionscUnfortunately in several cases, the central loci of the physical measures are relatively c diffuse, for example the cycling improvements in Coalville are spread over a wide area, or else they c annot be tied to a fixed location, egcthe demand responsive transport scheme in Hattersleycc Hence it was agreed that the dosage analysis would focus on improved ac ess to the stations and c interchanges relating to the Rochdale and Eastleigh schemes, using geocoded data to measure the c distance from respondents' home postcodes to the primary measures, iœcsimilar to the approach of c Goodman et alc(2014) and Heinen et alc(2015)c Consideration was given to the buffer radius, as this c depends on the ac ess/egress mode, which is affected by egcparking provision, as well as the main c mode (national rail, tram, bus)c The inclusive dosage radius was set at 800 metres from the stated c station or interchange postcode, as determined from the Metrolink website (for Tram) and National c Rail Enquiries (for rail), and the postcodes converted to GPS coordinates (WGS84), from which the c relative distances to respondents 'as the crow flies' were calculatedcThe dosage radius is informed c by the literature and previous work conducted, particularly from work on walking catchments of c local rail stations (see, for, example Blainey and Preston, 2010)cTable A2c12 shows the Stations from c which the dosage respondents were sampled (see Figures A6 and A3 in Annex B for the location of c these interventions), with around a quarter in both Eastleigh and Rochdale being deemed to live c within these high dosage areasc

c

c

Table A2.12: Intervention Stations and Dosage Sample Respondents c

Treatment Areac	Locusc	Postcode*c	Latitude**c	Longitude**c	Impact Radius (m)c	Nocof Respondents***c	
Rochdale							
Sustainable ac ess to rail and c Metrolink in Rochdale c	Rochdale Town Centre/Interchangec	OL16 1TUc	53c616972c	-2c15574c	800c	18c	
	Rochdale Railway Station (Tram Station)c	OL11 1DNc	53c611662c	-2c154254c	800c	21c	
	Newbold Tram Stationc	OL16 5HEc	53c613488c	-2c137906c	800c	13c	
	Kingsway Business Park Tram Stationc	OL16 4JNc	53c611284c	-2c123117c	800c	19c	
	Milnrow Tram Stationc	OL16 4HQc	53c609257c	-2c109312c	800c	6c	
	Castleton Railway Stationc	OL11 3EBc	53c593327c	-2c179116c	800c	27c	
					Total Rochdale****:	88c	(Out of 331 Respondents)c
Eastleigh							
Interchange Improvementsc	Eastleigh Railway Stationc	SO50 4FLc	50c975606c	-1c353343c	800c	54c	
	Chandlers Ford Stationc	SO53 4DEc	50c98244c	-1c384816c	800c	69c	
					Total Eastleigh:	123c	(Out of 510 Respondents)c

* For Metrolink, taken from Transport for Greater Manchester website (wwwcmetrolinkc ouk) - October 2015c
For Rail, taken from National Rail Enquiries (wwwcnationalrailc ouk) - October 2015c
** From GPS coordinates (WGS84 datum), and subject to GPS ac uracy/mapping errorsc
*** Respondents who completed both the Before and After surveys, and living within the impact radius ('as the crow files')c
**** Includes 16 respondents who lived within 800m of two stations (3 lived within 800m of Town Centre and Rail Station, 1 lived within 800m of Rail Station and Newbold, c
6 lived within 800m of Newbold and Kingsway, 6 lived within 800m of Kingsway and Milnow)c

c

The proximity DiD analysis of travel behaviour between those in the dosage areas versus those who c were not within the impact radius for Rochdale and Eastleigh are shown in Tables A2c13a and A2c13b c respectivelycNote the difference-in-differences in these tables are calculated as: c

DiD = Δ Respondents homed within 800m of station(s) – Δ those living more than 800m from station(s), c where Δ = Change in distance travelled per mode per week (After Survey minus Before)cc

Table A2.13a: Dosage Comparison – Weekly Travel Distances by Mode (Miles) in Rochdale c

Comparing Dosage vs Non-dosage Areas — Distance differences, given in Milesc

Rochdalec

Travel DiD - Sustainable Access to Rail/Metrolink*	Rochdale Town c Centre / Interchange c Only c	Rochdale Rail c Station Onlyc	Newbold Tram c Station Only c	Kingsway Tram c Station Onlyc	Milnrow Tram c Station Onlyc	Castleton Rail c Station Onlyc	All Stationsc
Walkingc	-0c6 c	-3c4 c	-3c8 c	0c8c	4c1c	2c2c	0c0c
Cyclingc	0c2c	-0c3 c	0c2c	0c2c	0c2c	0c2c	0c1c
Bus Travelc	-9c0 c	-12c5 c	8c1c	10c7c	25c3c	4c1c	2c1c
Train Travelc	1c7c	**-94.9**	-169c7 c	-35c0 c	-51c8 c	2c8c	**-30.0**
Car Drivingc	-12c0 c	14c0c	4c7c	-30c2 c	-97c1 c	-46c2 c	-18c1 c
Car Passengerc	-18c4 c	-8c1 c	3c0c	-32c0 c	-49c5 c	-4c8 c	-12c8 c
Other Modesc	-2c2 c	-0c7 c	-1c9 c	-120c5 c	-377c3 c	39c1c	-14c7 c
Active Travel**c	-0c4 c	-3c7 c	-3c6 c	1c0c	4c3c	2c4c	0c1c
Public Transport**c	-7c3 c	**-107.4**	-161c6 c	-24c3 c	-26c5 c	6c8c	-27c9 c
Sustainable Travel**c	-7c7 c	-111c1 c	-165c1 c	-23c3 c	-22c2 c	**9.2**	-27c8 c
All Car Travel**c	-30c4 c	5c9c	7c7c	-62c2 c	**-146.6**	-51c1 c	-30c9 c
All Travel (including Other Modes)c	-40c4 c	-105c9 c	-159c3 c	**-206.0**	**-546.1**	-2c8 c	**-73.4**

* The Difference-in-Differences is calculated as: DiD = Δ Respondents homed within 800m of station(s) – Δ those living more than 800m from station(s), where Δ = Change in distance travelled per mode per week (After survey minus Before)c
** 'Active Travel' includes Walking and Cycling; 'Public Transport' includes Bus and Train Travel; 'Sustainable Travel' is the combination of Active Travel and Public Transport, while 'All Car Travel' includes Driving and Car Passengerc
Note - Bold indicates a statistically-significant difference between dosage respondents and those living outside the impact radius, Mann-Whitney U Test, p<0c05cThe DiD in the means shown may be subject to rounding errorc

c

Table A2.13b: Dosage Comparison – Weekly Travel Distances by Mode (Miles) in Eastleigh c

Comparing Dosage vs Non-dosage Areas — Distance differences, given in Milesc

Eastleighc

Travel DiD - Eastleigh Interchange Improvements*	Eastleigh Station c Onlyc	Chandlers Ford c Station Onlyc	Eastleigh and c Chandlers Ford c Stationsc
Walkingc	0c7c	0c6c	0c6c
Cyclingc	-0c1 c	0c7c	0c4c
Bus Travelc	0c4c	2c2c	1c4c
Train Travelc	-12c3 c	-23c0 c	-18c3 c
Car Drivingc	-13c4 c	27c2c	9c4c
Car Passengerc	0c3c	**18.1**	10c3c
Other Modesc	0c4c	7c3c	4c3c
Active Travel**c	0c6c	1c3c	1c0c
Public Transport**c	-11c9 c	-20c9 c	-16c9 c
Sustainable Travel**c	-11c3 c	-19c5 c	-15c9 c
All Car Travel**c	-13c1 c	45c3c	19c6c
All Travel (including Other Modes)c	-24c0 c	33c1c	8c0c

* The Difference-in-Differences is calculated as: DiD = Δ Respondents homed within 800m of station(s) – Δ those living more than 800m from station(s), where Δ = Change in distance travelled per mode per week (After survey minus Before)c
** 'Active Travel' includes Walking and Cycling; 'Public Transport' includes Bus and Train Travel; 'Sustainable Travel' is the combination of Active Travel and Public Transport, while 'All Car Travel' includes Driving and Car Passengerc
Note - Bold indicates statistically-significant difference between the dosage respondents and those living outside the impact radius, Mann-Whitney U Test, p<0c05cThe DiD in the means shown may be subject to rounding errorc

c

c

c

The proximity analysis for Rochdale (Table A2c13a) shows that overall travel has reduced significantly c by 73 miles per week year-on-year for those living closer to the primary treatment interventions, iœcc sustainable ac ess to rail/MetrolinkcThis is also significant for those living near Kingsway and c Milnrow tram stations, although it should be noted these are relatively small sample sizes (n=19 and c 6 respectively)cThe DiD in the means suggest an underlying trend of a year-on-year reduction in all c ar travel for dosage respondents across the majority of impacted stations, which is significant in c Milnrow, although respondents near Rochdale rail and Newbold tram stations show minor increasescc While this could reflect some impact from the primary LSTF-funded interventions, the changes are c omplemented by a general reduction in train travel among the dosage respondents as compared to c those living further afield, except in the case of Rochdale Town Centre and for Castleton, which show c small DiD increasescThe DiD reduction in train travel is significant at Rochdale Rail Station, which at c first sight is counter-intuitive to the implementation of the LSTF measurescHowever, research with c the local focus group (see Appendix 7) shows that, while the LSTF measures were partly c encouraging, user dissatisfaction with the rail service overall was extremely discouraging, with trains c ited as being 'dirty', 'unreliable', usually 'jam-packed', with insufficient carriages and poor rolling c stock, particularly at Rochdale StationcBlocked ac ess to the car park, which discouraged mode c switch, and a lack of real-time passenger information were also cited as being deterrents for rail use c in the area, whilst the redevelopment of Manchester Victoria station was also a factorcThe focus c group also said that roadworks, in conjunction with tram and interchange improvements in the town c entre, created potholes, uneven pavements, and an environment that was not generally conducive c to travellingcThis contrasts with a DiD increase in walking, cycling and bus travel for respondents c living close to the stations out of town, which is significant in the case of Castleton for sustainable c travel (Table A2c13a)cCastleton also shows a DiD increase in other modes of travel for dosage c respondents, which when combined with sustainable travel, is offset against the decrease in all car c usecWhile most of these changes are not significant, there is a general trend of DiD reductions in c other modes of travel across all the impacted stations (Table A2c13a), which suggests that c Personal Travel Planning may be having some effect on localised respondents, and that congestion c through roadworks and trip suppression (as discussed in section A2c1 above) may not be the only (or c major) factor for travel in and around Rochdalecc

A similar DiD reduction in train use by dosage respondents appears in Eastleigh (see Table A2c13b), c which is again counter-intuitive, given the LTSF investment in improving the interchange at Eastleigh c StationcHowever, the overall DiD trend in bus use has increased, although neither of these changes c are significantcHowever, proximity to Chandlers Ford Station shows a significant DiD increase in car c passenger use, which may reflect some impact due to secondary LSTF interventions, egc Area Travel c Plans, but could also point to extraneous factors, such as increased uptake in the local 'dial-a-ride' c service (as discussed in the Eastleigh focus group), and the introduction of new taxi-share services in c Chandlers FordcThis compares against a 1% mode share reduction in the mean car passenger c distances travelled year-on-year in Eastleigh generally (see Table A2c4 further above)c c

DiD comparisons were also made between the Rochdale and Eastleigh dosage respondents against c their corresponding control groups (Wigan and Fareham respectively)cThese results are not c presented here for simplicity, but they show similar trends to the dosage versus non-dosage groups, c although the DiD distances in cycling, bus and train travel are generally much lower for Rochdale as c ompared to Wigan, which (like the Hinckley situation discussed further above) suggests that this c ontrol area may also be susceptible to travel behaviour changes arising from recent local c

c

sustainable transport schemes, making aggregate comparisons between the dosage treatment and control areas even more difficult. However, the DiD change in bus use for dosage respondents in Eastleigh is now significant, at 2.3 miles, compared to the reduction seen in Fareham as discussed previously.

These proximity results show that changes in travel behaviour may be much more localised, variable and complex than the original aggregate treatment and control results had indicated further above. However, it should be noted that those living closer to the transport interventions do not necessarily benefit directly from them, e.g. because their work, shopping and social travel patterns do not engage with the local schemes. In addition, at least in the case of Rochdale and Eastleigh, proximity to rail, tram and bus stations may not provide an adequate or representative sample of respondents. In this case, the dosage sampling only picked up approximately 25% of all the people who responded in both the Rochdale and Eastleigh treatment areas (see Table A2.12), and the samples were even lower for those living close to specific stations, so these findings may be of limited use. However, the proximity results reinforce our finding that there are very few statistically significant changes in travel behaviour that can be attributed to the LSTF initiatives.

In conclusion for this section, we have shown that there have been some changes in travel behaviour as measured by travel distance in the expected direction given the LSTF interventions, although few are statistically significant, and there have also been a number of unexpected changes. In particular, some of the observed DiD reductions in car travel (Table A2.5) may be attributed to trip suppression, which was not an intended outcome of the LSTF. On the other hand, this reduction may also be related to increases in car passenger usage, which can be a common outcome of LSTF-type measures (ITP, 2015).

In the next Appendix, we will look at market segmentation to assess which segments were the most likely to change their sustainable travel behaviour. This is followed by Appendix 4, which presents the findings to respondents' attitudes to travel, including their awareness of local sustainable transport schemes, and whether this has an effect on their travel behaviour.

c

Appendix 3: Market Segmentation

The respondents to the cohort survey were separated into nine segments, for the purpose of analysing their perceptions of travel and overall travel behaviour, using the segmentation model as devised by Thornton et al. (2011). This method uses two sets of 'Golden Questions', or categorical questions used to differentiate respondents (see Annex D), as applied from an earlier survey, and a series of weightings to score the respondents' answers, which were then put through two algorithms to segment people into nine different groups. The nine groups are divided into those who are 'car-owners', and 'non-owners', with six segments falling into the former, and three in the latter. The nine car-owner and non-owner segments are shown in Table A3.1.

Table A3.1: The Nine Segments suggested by Thornton et al. (2011)

Segment	Description of segment
Car owners	
1	Older, less mobile car owners
2	Less affluent urban young families
3	Less affluent, older sceptics
4	Affluent empty nesters
5	Educated suburban families
6	Town and rural heavy car users
Non-owners	
7	Elderly without cars
8	Young urbanites without cars
9	Urban low income without cars

In Thornton et al. (2011)'s model, a single Golden Question was used to determine whether the respondent was a car-owner or non-owner, and then two different sets of further Questions were used to divide the car-owners into segments 1 to 6, and non-owners into segments 7 to 9 - see Annex D for further details. However, the more complex nature of the cohort survey questions meant the process to determine car ownership was more involved, with four criteria being used instead of one. In addition, although some of Thornton et al.'s Golden Questions had been incorporated into the cohort survey, such as age and whether speed/performance was important when buying a car or van, others were not, e.g. the Questions on social grade and annual-mileage driven, although these could be inferred from other questions asked. The coding of the answers and categories used in the survey also differed generally from those of Thornton et al., for example in the highest level of education obtained (which does not separate out GCSE grades), and household income (which is split into salary bands rather than descriptions of people's 'current situation'). The mapping between the Golden Questions as used by Thornton et al. and those applied in the survey therefore differed to some extent, although the principles are broadly the same, and a *reasonable* mapping process between the sets of questions was devised, the details of which are also given in Annex D, with a similar segmentation methodology to Thornton et al. then applied, from which it was possible to divide the vast majority of the cohort respondents into the nine segments. Of the 3,446 people in the before and after cohort dataset (including one missing age), i.e. those who had responded to some or most parts of both surveys, it was possible to segment all but two of the respondents, encompassing 3,102 car-owners and 342 non-owners (90% and 10% respectively).

A3.1 Analysis of Car Ownership

Four criteria questions were used to determine car ownership in the survey: the 'Number of Private cars/vans' kept overnight, the 'Number of company cars/vans' kept overnight and two corresponding 'Tick if Zero Cars' flags. The respondents' answers were first cleaned for data inconsistencies, e.g. where the 'Tick if Zero' box had been ticked, but the Number of Private cars/vans was stated to be one or more (see Annex D for details). 'Car-owners' were then deemed to be those who kept one or more Private cars/vans overnight (irrespective of whether they had a Company car/van or not) *and* those who did not have a Private car/van (where the Number of Private cars/vans was zero or missing, or if the 'Tick if Zero Private cars/vans' was ticked) but kept a Company vehicle(s) overnight. 'Non-owners' were therefore those who stated they did not keep either a Private or Company car/van overnight, although in 78 cases they also stated car driver mileage in their travel diaries, and it was not possible to establish whether this was due to e.g. membership of car clubs or access to other vehicles. Figure A3.1 shows the number of Private vehicles kept by survey respondents for the household (n=3,444), while Table A3.2 shows the ownership breakdown of Private/Company cars/vans (which includes 2 records with no car ownership data).

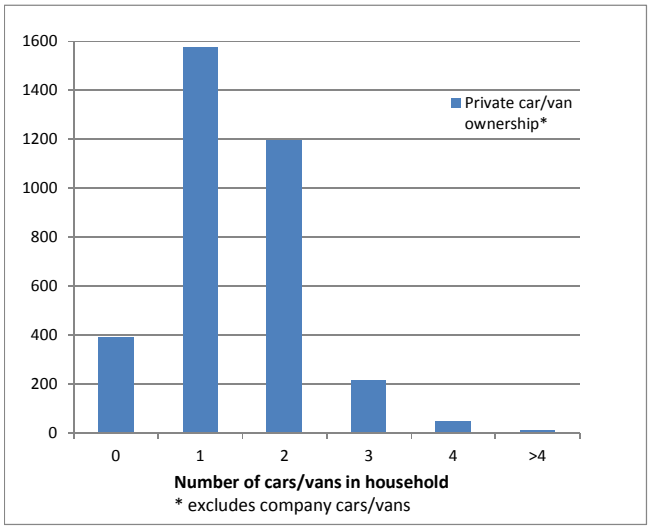


Figure A3.1: Private Car/Van Ownership

Table A3.2: Breakdown of Private and Company Car/Van Ownership

	All Respondents	%	Treatment Area	%	Control Areas	%
Kept Private car/van(s) only	2,744	80%	1,671	78%	1,073	82%
Kept Company car/van(s) only	52	2%	34	2%	18	1%
Kept both Private and Company car/van(s)	306	9%	175	8%	131	10%
Car-owner (kept any car/van - Private, Company or both)	3,102	90%	1,880	88%	1,222	93%
Non-owner (kept neither Private nor Company car/van)	342	10%	254	12%	88	7%
	3,444	100%	2,134	100%	1,310	100%
Missing Private and Company car/van data	2		0		2	
Total Respondents	3,446		2,134		1,312	

From Figure A3.1, it can be seen that most respondents 'owned' one Private car/van (n=1,576), while many had two (n=1,197), and a small but sizeable proportion kept three or more (n=277).

This compares to 393 respondents who did not own a Private vehicle, although 52 of these kept a Company car/van. Of the Private car/van owners (n=3,050), a sizeable proportion also kept a Company vehicle (n=306) - see Table A3.2. As Table A3.2 shows, a feature of our before and after sample is the high level of car ownership at 90% overall, with this being slightly higher in the control areas (93%) and lower in the treatment areas (88%). This compares with the 2013 NTS survey, where 81% of adults lived in a household with a car. It should be noted that the proportions of respondents in the treatment and control areas as presented in Table A3.2 are unweighted. If the aggregate respondents were weighted in the control areas (to enable like-for-like comparisons with the treatment areas), the change in the proportion of car and non-car owners would be less than 0.4% in each case, i.e. there is virtually no difference in these proportions, irrespective of whether a weighting is applied or not (at 93% of car-owners and 7% non-owners respectively).

A3.2 Income and Occupation

Table A3.3 details the response to the Income question. It should be noted that around 8% of respondents did not answer this questions and a further 8% claimed not to know the income of their household. The household income levels in the control areas are generally higher than those in the treatment areas, although this is largely due to Fareham/Locks Heath, where 29% of respondents came from households with annual incomes above £50,000, compared to around 19% overall. Again, if a double weighting was applied to Fareham and Wigan to enable like-for-like comparisons between the aggregate control and treatment areas, there would only be a very small difference (of 0.2 to 0.8%) in the proportions of respondents in each income level for the control group.

Table A3.3: Income Group by Treatment/Control Area

Income: \ Area:	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport	Overall	Treatment Areas	Control Areas
Up to £10,000	15.1%	10.0%	15.7%	8.9%	8.4%	6.7%	4.3%	7.9%	8.7%	10.1%	8.2%
£ 10,001 - £ 20,000	20.8%	22.3%	20.6%	23.1%	19.1%	14.5%	11.9%	19.3%	18.2%	21.4%	17.0%
£ 20,001 - £ 30,000	12.1%	18.2%	17.9%	16.9%	16.1%	15.7%	20.9%	19.8%	17.5%	18.3%	20.0%
£ 30,001 - £ 40,000	5.7%	10.0%	9.4%	12.1%	10.3%	14.9%	14.3%	13.6%	11.8%	12.7%	12.9%
£ 40,001 - £ 50,000	7.6%	6.3%	8.5%	7.0%	11.4%	12.4%	10.4%	8.6%	9.3%	9.4%	11.2%
£ 50,001 - £ 75,000	7.9%	8.0%	6.3%	10.5%	9.2%	13.3%	13.5%	11.4%	10.6%	11.4%	11.5%
More than £ 75,000	6.0%	4.6%	2.2%	4.3%	9.2%	9.6%	15.1%	5.3%	7.9%	6.7%	11.6%
Don't know	14.5%	10.4%	12.6%	9.7%	9.0%	6.5%	4.0%	7.1%	8.4%	10.0%	7.7%
Not answered	10.3%	10.2%	6.7%	7.5%	7.3%	6.5%	5.6%	7.1%	7.5%	100.0%	100.0%
Total:	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Note: These percentages are for those who replied (including 'Don't know')	

Table A3.4 details the response to the Occupation question. This shows that respondents from the control areas tend to be from households where the chief wage earner is in a higher occupation class than respondents from the treatment areas, and again, this is most marked for Fareham.

Table A3.4: Occupation Group by Treatment/Control Area

Occupation: \ Area:	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport	Overall	Treatment Areas	Control Areas
Senior Managerial/Professional	10.9%	9.0%	4.5%	9.1%	12.0%	13.9%	16.7%	9.0%	11.4%	10.7%	13.1%
Middle managerial	9.7%	14.1%	9.9%	12.1%	18.7%	19.8%	18.9%	12.2%	15.2%	14.3%	17.6%
Junior managerial/clerical/supervisory	6.3%	6.3%	4.0%	5.1%	8.6%	6.5%	4.3%	9.8%	6.5%	7.1%	5.9%
Skilled manual	10.3%	9.5%	14.8%	14.0%	8.2%	9.0%	7.7%	13.6%	10.4%	11.5%	9.2%
Unskilled manual	4.2%	7.3%	9.0%	5.6%	4.3%	3.9%	1.9%	5.1%	4.7%	5.3%	4.0%
Full time student	0.6%	0.2%	0.4%	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%
Retired	46.5%	47.1%	49.3%	46.8%	43.3%	42.7%	47.8%	45.8%	45.9%	46.6%	47.2%
Unemployed/between jobs	0.6%	2.4%	2.2%	2.2%	1.3%	1.2%	1.0%	1.2%	1.4%	1.5%	1.3%
Housewife/househusband	3.6%	0.7%	1.8%	0.8%	0.9%	0.8%	0.0%	0.8%	1.0%	1.2%	0.6%
Other	3.0%	2.4%	1.8%	1.3%	1.3%	0.4%	0.3%	1.2%	1.3%	1.6%	0.9%
Not answered	4.2%	1.0%	2.2%	3.0%	1.5%	1.8%	1.1%	1.2%	1.8%	100.0%	100.0%
Total:	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Note: These percentages are for those who replied (including 'Other')	

Again, the change in the proportions of each occupation type due to weighting the control group is very small (varies from 0 to 0.7%).

A3.3 Analysis of Market Segments

The respondents' answers to the 10 car-owner and 10 non-owner segmentation questions were then analysed, and the algorithms suggested by Thornton et al. used to allocate them to each of the 9 segments - see Annex D for further details. Figure A3.2 shows the proportion of car-owners allocated to segments 1 to 6 (n=3,102) between the treatment and control areas, while Figure A3.3 shows the proportion of non-owners allocated to segments 7 to 9 (n=342).

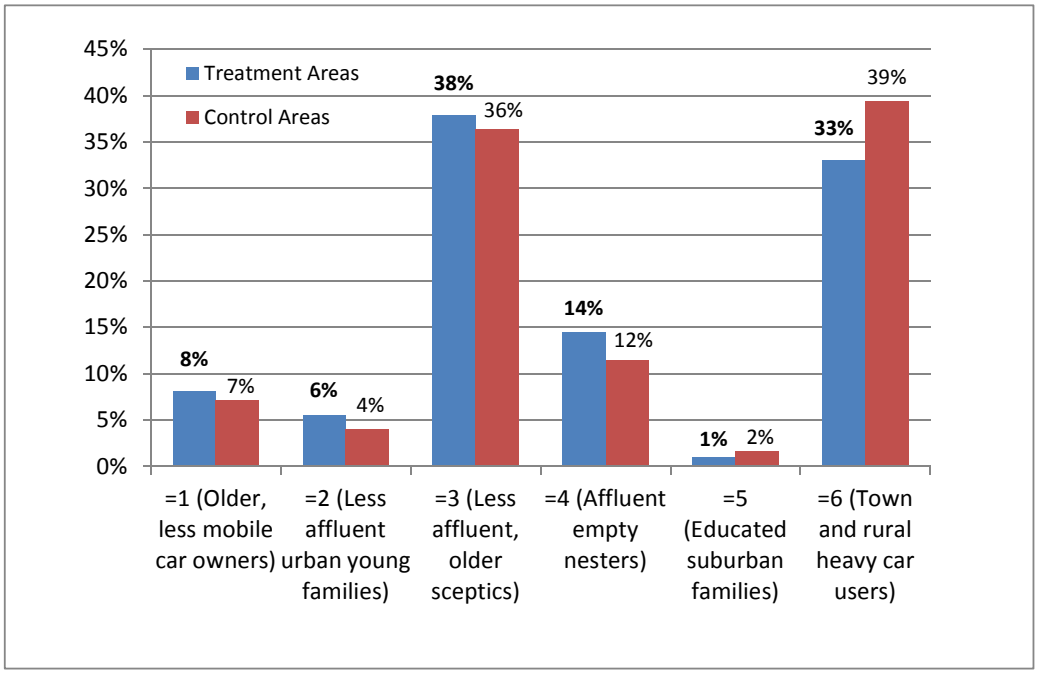


Figure A3.2: Proportion of Car-owners in Segments 1 to 6 in Treatment/Control Areas

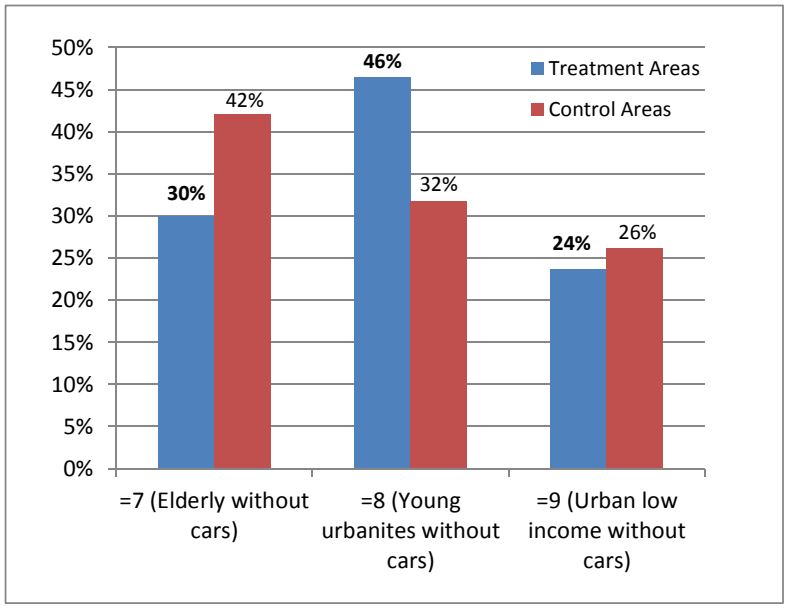


Figure A3.3: Proportion of Non-owners in Segments 7 to 9 in Treatment/Control Areas

If the control areas were double weighted in favour of Fareham and Wigan, the proportions of those in each segment would change by 0% (segment 1), 0.1% (segment 2), 0.3% (3), -0.2% (4), 0% (5), -0.1% (6), 0.2% (7), -0.4% (8) and 0.7% (9) respectively, i.e. no significant change in any segment. Figure A3.4 shows how the overall percentage distribution of all 9 segments in this study (n=3,444) compares to Thornton et al.'s overall population sample.

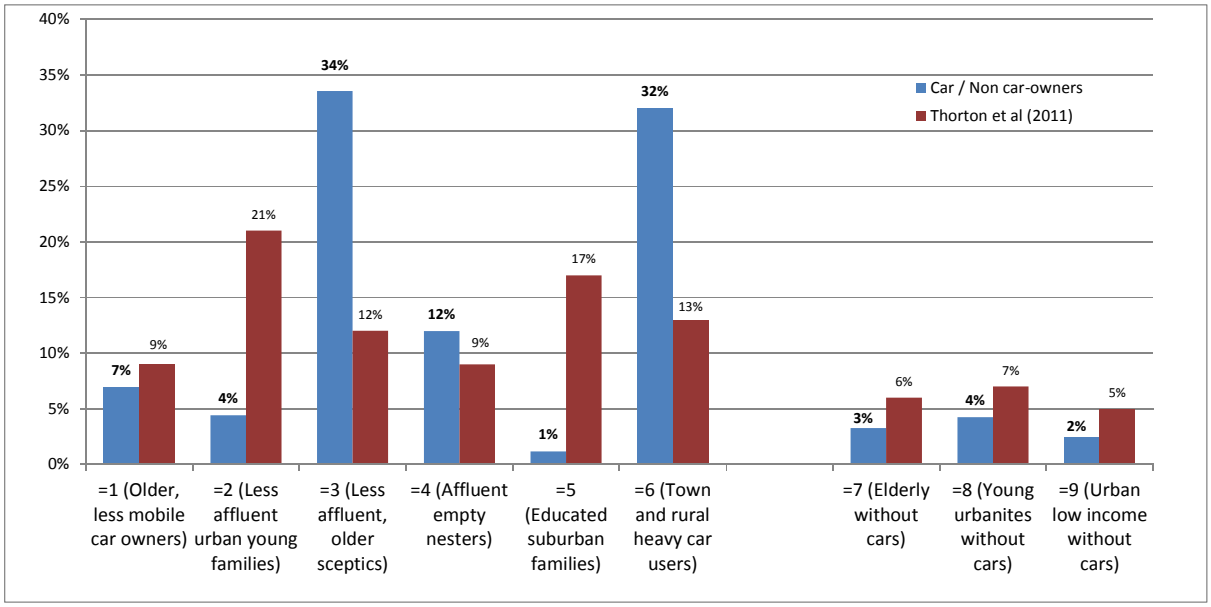


Figure A3.4: Segmentation of Car- and Non Car-owners vs Thornton et al.

Figure A3.4 shows there is a difference between our segment shares and those of Thornton et al. (2010), which could be due to differences in our sample and/or the mapping method we employed. We find around 34% of our before and after sample is in segment 3 (Less affluent, older sceptics) compared to 12% nationally, according to Thornton et al. This has increased from 26% across all the people who responded to the before survey (N=6,798), i.e. when including those who did not respond to the after survey. In addition, 32% of our sample is in segment 6 (Town and rural heavy car users) compared to 13% nationally, whilst segment 4 (Affluent empty nesters) accounts for 12% of the sample but only 9% nationally. All other segments are under-represented compared to national averages, in particular segment 5 (Educated suburban families) which accounts for only 1% of our sample but 17% of the national population. Looking at Figures A3.2 and A3.3, we find the patterns of market segmentation broadly similar between the treatment and control areas, particularly with respect to the low representation of segment 5, although the control areas have a higher percentage of Town and rural heavy car users (segment 6), with correspondingly smaller percentages of people in the other remaining car-owning segments. Similarly, for non-owners, the control areas have a higher percentage of Elderly without cars (segment 7), with a correspondingly lower percentage of the Young urbanites without cars (segment 8). Overall, it can be seen from Figure A3.4 that the proportions of non-owners in segments 7 to 9 are of a similar order of magnitude to those suggested by Thornton et al., and when compared to the car-owners overall. The difference in the distribution of car-owners compared to Thornton et al. is likely to be due to the nature of the treatment and control areas being monitored by the survey, e.g. they include areas of relatively high car dependency, such as Coalville and Hinckley, as well as the M3 and M27 motorway commuting corridors around Eastleigh and Fareham, which is reflected in the higher proportions of

Town and rural heavy car users (segment 6) in the control areas (Figure A3.2), and the overall age weighting of the respondents (with higher percentages of segments 3 and 4) as discussed in Section A1.5 previously. Again, it should be noted that there is very little difference between weighting and not weighting the control group in terms of the proportions of each segment, with these differences being less than 0.1% for segments 1, 2, 5, 7 and 9, 0.1% for segment 3, less than 0.4% for segments 4 and 8, and 0.8% for segment 6.

The accuracy of Thornton et al.'s market segmentation methodology was assessed with respect to the Coalville 2014 focus group. This indicated that up to 9 out of the 13 participants exhibiting the demographic and travel behaviour suggested. However, in 4 cases, the assigned car-owner and non-owner segments appeared to be wrong, with 4 out of the 13 participants exhibiting behaviour and attributes which did not aligned to those as suggested by the segmentation. This suggests an accuracy of 70%, somewhat lower than the 80% overall accuracy rate reported by Thornton et al. In all cases, the focus group participants answered at least 8 of the mapped Golden Questions from the survey, and from the on-site observations made, the segmentation methodology appeared to reflect the age and demographic of the Coalville participants generally, although in one case the person was attributed to segment 8 (Young urbanites without cars), when she had already retired, and another to segment 2 (Less affluent urban young families), when the person did not have any children and was living only with one adult. There may also be similar issues on reflecting behaviour. For example, one car-owner who was very much 'pro' active travel, and was vocal about this, was placed (perhaps incorrectly) in segment 3, while another assigned to segment 4 (Affluent empty nester) was on low-income and did not drive very much. Nevertheless, we have analysed the change in travel behaviour in terms of these designated market segments.

A3.4 Travel Behaviour Change by Market Segments

Our findings for the change in travel behaviour for the car-owning segments are illustrated by Table A3.5. Similar to the approach taken for Table A2.4 above, we examined the difference-in-differences (DiD) in mode split by distance travelled between the treatment and control areas, with a particular focus on sustainable travel, i.e. active travel and public transport.

Table A3.5: Change in Modal Split in Treatment and Control Areas by Car Owning Market Segments

	Treatment Areas		Control Areas		
%	Sustainable Travel	Other Travel	Sustainable Travel	Other Travel	DiD Sustainable
Segment 1 (Older, less mobile car owners)	4.3%	-4.3%	8.2%	-8.2%	-3.9%
Segment 2 (Less affluent urban young families)	2.9%	-2.9%	11.6%	-11.6%	-8.7%
Segment 3 (Less affluent, older sceptics)	1.5%	-1.5%	-2.9%	2.9%	4.4%
Segment 4 (Affluent empty nesters)	-2.6%	2.6%	6.6%	-6.6%	-9.3%
Segment 5 (Educated suburban families)	2.1%	-2.1%	-4.1%	4.1%	6.2%
Segment 6 (Town and rural heavy car users)	-0.4%	0.4%	-2.6%	2.6%	2.2%
Total (All Segments)	-0.1%	0.1%	-0.9%	0.9%	0.8%

We find that for three out of the six segments there are stronger trends toward sustainable travel (and three weaker trends away from sustainable travel) for the control areas compared to the treatment areas, contrary to our expectations. The three exceptions are segment 3 (Less affluent,

older sceptics), segment 5 (Educated suburban families) and segment 6 (Town and rural heavy car users). However, the very low percentage of our sample in segment 5 should be reiterated. By contrast, segments 3 and 6 are very well represented in our sample and there is an indication that these segments might be relatively more responsive to LSTF measures. Based on the difference-in-differences approach, the least responsive segments appear to be Affluent empty nesters (segment 4) and Less affluent urban young families (segment 2), which is not surprising, given the comments borne out by the 2014 and 2015 focus group meetings: Affluent empty nesters are more concerned with use of their time than mode choice, while Less affluent urban young families have more divergent travel demands that require complex trip movements or chaining, e.g. to get to school/nursery before work (and to be on time for both), which were said to be unachievable realistically by public transport.

Our findings for the non-car owning segments are given by Table A3.6. This suggests that segment 8 (Young urbanites without cars) could have been influenced by LSTF measures, which is perhaps not surprising, based on similar experience from young urbanites living in London and other large cities. By contrast, segment 9 (Urban low income without cars) does not seem to have been affected, where the total mean distance travelled has decreased year-on-year, and the strong switch to sustainable modes in the control areas is again related to increases in rail use (as discussed in Appendix 2 above).

Table A3.6: Change in Modal Split in Treatment/Control Areas by Non-Car Owning Market Segments

	Treatment Areas		Control Areas		
%	Sustainable Travel	Other Travel	Sustainable Travel	Other Travel	DiD Sustainable
Segment 7 (Elderly without cars)	1.7%	-1.7%	10.4%	-10.4%	-8.7%
Segment 8 (Young urbanites without cars)	44.7%	-44.7%	35.1%	-35.1%	9.6%
Segment 9 (Urban low income without cars)	-4.2%	4.2%	34.4%	-34.4%	-38.6%

The causes of these variations in behaviour across market segments are not easy to explain - the most likely explanation is that this is due to random variation. In addition, we were unable to replicate the national average segmentations in our sample to those suggested by Thornton et al. (2011). This may be important because segments 5 and 8 are heavily underrepresented, yet they are potentially the most responsive to LSTF interventions (as shown by Tables A3.5 and A3.6). The next Appendix will look at respondents' attitudes to travel, their awareness of the LSTF schemes and whether this has an impact on their sustainable travel behaviour.

Appendix 4: Analysis of Travel Attitudes, Awareness and Associated Behaviour

Respondents' perceptions of active travel and public transport, their awareness of the LSTF interventions and the perceived impact on their travel behaviour were assessed using a series of questions where they were asked to provide an opinion in the cohort survey (see Annex A).

A4.1 Attitudes to Sustainable Travel

Respondents' attitudes to walking and cycling, and bus and train use, i.e. active travel and public transport, as well as the impact of traffic were assessed using the following statements, derived from the iConnect project, namely that:

For Walking and Cycling:

- 1a) Walking is unsafe because of the traffic;
- 1b) Cycling is unsafe because of the traffic;
- 1c) The level of crime or anti-social behaviour means walking or cycling is unsafe;
- 1d) There are pavements suitable for walking;
- 1e) There are dedicated routes or paths for cycling;
- 1f) The routes for walking and cycling are generally well lit at night;
- 1g) The routes are pleasant for walking or cycling;
- 1h) I am willing to cycle on the roads (e.g. to work/school/the shops);
- 1i) I would cycle more if there were more dedicated cycle paths;

For Travelling by Bus and Train:

- 2a) Bus services go where I need to go;
- 2b) Train services go where I need to go;
- 2c) Buses are a reliable/punctual form of travel;
- 2d) Trains are a reliable/punctual form of travel;
- 2e) Bus stops are conveniently located;
- 2f) Train stations are conveniently located;
- 2g) Bus journeys are pleasant;
- 2h) Train journeys are pleasant;
- 2i) The value for money of the bus ticket is generally satisfactory;
- 2j) The value for money of the train ticket is generally satisfactory;
- 2k) In general, I think that successful people tend to travel by car rather than by bus;
- 2l) In general, I think that successful people tend to travel by car rather than by train.

Respondents were asked whether they 'strongly agree', 'somewhat agree', 'neither agree nor disagree', 'somewhat disagree' and 'strongly disagree' with each of these statements. Their responses were scored in the dataset from -2 to +2, with -2 representing 'strongly disagree', -1 as 'somewhat disagree', 0 being 'neither agree nor disagree', +1 as 'somewhat agree' and +2 representing 'strongly agree'. We appreciate there are some issues with converting ordinal data to cardinal numbers in this way, for example, by implying that the intervals between the different views of opinions are the same. However, we do so for ease of exposition, and only to provide indicative comparisons of respondents' opinions and attitudes between the before and after surveys. The scores were used to calculate the mode (most commonly stated value) and the relative

proportions (expressed as a percentage) of the modes across the different treatment and control areas, as well as for the nine market segments as classified in Table A3.1 above.

Table A4.1 shows the mode (as a measure of central tendency), proportion of the mode and sample size (n) for the walking and cycling attitudinal responses across the eight treatment and control areas in the after survey. Note that the values for the control areas in this Table are shown shaded, and that the value of *n* differs, as not all respondents replied to every statement. Note also that for convenience the Tables presented in this section have been summarised simply into those who agree/disagree with the statements for the Executive Report that accompanies these Appendices.

Table A4.1: Attitudes Towards Active Travel - by Area (After Survey)

(rated on a scale from -2 (strongly disagree) to +2 (strongly agree))

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
1a) Walking is unsafe because of traffic								
Mode	1	-1	-1	-1	-1	-1	-1	-1
Proportion	29%	30%	32%	34%	36%	38%	35%	36%
n =	325	404	217	367	459	501	616	504
1b) Cycling is unsafe because of traffic								
Mode	1	1	1	1	1	1	1	1
Proportion	39%	49%	40%	46%	46%	50%	44%	47%
n =	324	400	217	363	454	498	617	502
1c) Level of crime/anti-social behaviour means walking/cycling is unsafe								
Mode	1	0	1	0	-1	-1	-1	-1
Proportion	33%	28%	31%	31%	34%	32%	34%	31%
n =	325	402	219	364	452	500	618	501
1d) There are pavements suitable for walking								
Mode	1	1	2	1	2	1	1	2
Proportion	43%	46%	41%	46%	41%	44%	43%	44%
n =	329	404	216	365	454	499	617	504
1e) There are dedicated routes or paths for cycling								
Mode	1	1	1	1	1	1	1	1
Proportion	41%	38%	41%	44%	45%	48%	47%	49%
n =	326	398	216	363	454	495	614	502
1f) Routes for walking and cycling are generally well lit at night								
Mode	0	0	1	0	0	1	0	1
Proportion	31%	31%	37%	30%	31%	36%	34%	36%
n =	325	401	217	366	454	496	611	501
1g) Routes are pleasant for walking or cycling								
Mode	0	0	1	1	0	1	1	1
Proportion	37%	38%	41%	39%	42%	43%	40%	43%
n =	328	399	215	367	458	495	611	499
1h) I am willing to cycle on the roads (e.g. to work/school/the shops)								
Mode	-2	-2	-2	-2	-2	-2	-2	1
Proportion	40%	41%	33%	33%	28%	34%	28%	25%
n =	295	384	209	348	431	476	599	485
1i) I would cycle more if there were more dedicated cycle paths								
Mode	-2	-2	2	0	0	2	2	1
Proportion	26%	26%	25%	25%	27%	26%	32%	27%
n =	297	385	211	346	432	479	599	483

The mode values shown in Table A4.1 are similar to those of the before survey, with little change year-on-year. Generally we found that respondents had ongoing concerns over personal security in cycling and most respondents still showed strong unwillingness to cycle on the roads. The attitudes to walking and cycling were generally consistent between the different treatment and control areas, although respondents in Rochdale and Wigan also tended to agree that the level of crime/anti-social behaviour means active travel is unsafe. The notable exception is in Gosport, where the mode has increased from being neutral to slight agreement that respondents would cycle more if there were more dedicated cycle paths. This reflects a higher level of agreement in the South Hampshire areas generally, although this common view has not changed year-on-year in either Eastleigh or Fareham.

In terms of the nine market segments, Table A4.2 shows the modes and proportions to which respondents agreed with the set of active travel statements in the after survey.

Table A4.2: Attitudes Towards Active Travel - by Segment (After Survey)

(rated on a scale from -2 (strongly disagree) to +2 (strongly agree))

Segment:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1 to 9**	**1 to 6**	**7 to 9**
	Older, less mobile car owners	Less affluent urban young families	Less affluent, older sceptics	Affluent empty nesters	Educated suburban families	Town and rural heavy car users	Elderly without cars	Young urbanites without cars	Urban low income without cars	All Segments	Car owners	Non-owners
1a) Walking is unsafe because of traffic												
Mode	1	-2	-1	-1	-1	-1	1	1	-1	-1	-1	1
Proportion	29%	29%	34%	33%	38%	39%	31%	32%	31%	34%	35%	30%
n =	232	150	1,140	410	40	1,092	105	143	81	3,393	3,064	329
1b) Cycling is unsafe because of traffic												
Mode	1	1	1	1	1	1	2	1	1	1	1	1
Proportion	45%	43%	48%	45%	35%	46%	38%	38%	40%	46%	47%	37%
n =	233	150	1,125	407	40	1,097	101	141	81	3,375	3,052	323
1c) Level of crime/anti-social behaviour means walking/cycling is unsafe												
Mode	1	-1	-1	0	1	-1	-1	0	0	-1	-1	0
Proportion	31%	33%	31%	30%	33%	34%	29%	28%	31%	30%	31%	28%
n =	232	150	1,132	409	39	1,094	103	141	81	3,381	3,056	325
1d) There are pavements suitable for walking												
Mode	1	2	1	1	2	1	2	1	2	1	1	2
Proportion	48.1%	42.4%	43.5%	41.6%	47.5%	44.3%	39.4%	44.8%	42.7%	42.9%	43.3%	41.0%
n =	231	151	1,133	406	40	1,098	104	143	82	3,388	3,059	329
1e) There are dedicated routes or paths for cycling												
Mode	1	1	1	1	1	1	1	1	1	1	1	1
Proportion	40%	40%	46%	42%	30%	48%	36%	42%	38%	45%	45%	39%
n =	230	149	1,131	410	40	1,092	97	139	80	3,368	3,052	316
1f) Routes for walking and cycling are generally well lit at night												
Mode	0	1	0	1	0.5	1	0	1	0	1	0	1
Proportion	29%	35%	34%	31%	33%	33%	31%	32%	31%	30%	30%	29%
n =	230	150	1,127	408	39	1,091	106	140	81	3,372	3,045	327
1g) Routes are pleasant for walking or cycling												
Mode	0	1	1	1	1	1	1	1	1	1	1	1
Proportion	39%	40%	38%	39%	40%	39%	38%	37%	33%	38%	38%	36%
n =	228	147	1,131	407	40	1,091	105	141	83	3,373	3,044	329
1h) I am willing to cycle on the roads (e.g. to work/school/the shops)												
Mode	-2	1	-2	-2	-2	1	-2	-2	-2	-2	-2	-2
Proportion	39%	28%	37%	31%	38%	27%	35%	33%	28%	31%	31%	32%
n =	213	148	1,060	394	40	1,085	91	116	81	3,228	2,940	288
1i) I would cycle more if there were more dedicated cycle paths												
Mode	2	1	0	0	-2	2	0	0	0	0	2	0
Proportion	28%	31%	26%	29%	40%	30%	30%	24%	33%	24%	24%	29%
n =	211	150	1,059	395	40	1,090	92	116	80	3,233	2,945	288

While there are individual differences between the segments in both the before and after surveys, there is relatively little net change in year-on-year active travel attitudes for both car-owners (segments 1 to 6) and non-car owners (segments 7 to 9). However, there are indications from Table A4.2 that non-car owners continue to possess greater reservations about walking safety, i.e. they tended to slightly agree that 'walking is unsafe because of traffic' compared to a slight disagreement in car-owners. They were also generally neutral compared to slight disagreement among car-owners that crime/anti-social behaviour means walking/cycling is unsafe. Similarly, there are greater concerns for older people, particularly segments 1 (Older, less mobile car owners) and 7 (Elderly without cars), in the after survey that walking and cycling are unsafe, which mirror the findings from the before survey. Older, less mobile car owners (segment 1), as well as those living in urban areas, particularly segments 8 (Young urbanites without cars) and 9 (Urban low income without cars), and

Educated suburban families (segment 5) were also more concerned about the impact of crime and antisocial behaviour on walking and cycling in both the before and after surveys. Given the unwillingness of both car and non-car owners to cycle on the roads, and the lack of positive change year-on-year, this suggests attitudes to active travel may be more entrenched than can be dealt with by the provision of individual sustainable transport interventions. Again, there is a notable exception in Older, less mobile car owners (segment 1), who tended to strongly agreed they would cycle more if there were more dedicated cycle paths, and this was a change from the before survey.

With respect to public transport, we found in the before survey that non-car owners (segments 7 to 9) appeared to have more positive attitudes than car-owners (segments 1 to 6), although overall there are concerns over value for money, particularly with respect to rail. Both groups also tended to agree that the social norm is that successful people travelled by car rather than use public transport, particularly buses, with this being more strongly supported by non-car owners. Table A4.3 again shows there has been very little change in these perceptions in the after survey.

Table A4.3: Attitudes toward Public Transport- by Segment (After Survey)

(rated on a scale from -2 (strongly disagree) to +2 (strongly agree))

Segment:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1 to 9**	**1 to 6**	**7 to 9**
	Older, less mobile car owners	Less affluent urban young families	Less affluent, older sceptics	Affluent empty nesters	Educated suburban families	Town and rural heavy car users	Elderly without cars	Young urbanites without cars	Urban low income without cars	All Segments	Car owners	Non-owners
2a) Bus services go where I need to go												
Mode	1	1	1	1	0	1	2	2	2	1	1	2
Proportion	30%	38%	41%	33%	35%	30%	51%	48%	34%	34%	35%	45%
2b) Train services go where I need to go												
Mode	1	1	1	1	1	1	2	2	2	1	1	2
Proportion	37%	35%	44%	34%	40%	45%	46%	42%	33%	41%	42%	41%
2c) Buses are a reliable/punctual form of travel												
Mode	1	1	1	1	0	0	1	1	1	1	1	1
Proportion	35%	29%	40%	38%	38%	40%	34%	37%	32%	34%	34%	35%
2d) Trains are a reliable/punctual form of travel												
Mode	1	1	1	1	1	1	1	1	1	1	1	1
Proportion	39%	39%	47%	40%	43%	46%	42%	50%	37%	45%	45%	44%
2e) Bus stops are conveniently located												
Mode	1	1	1	1	1	1	2	2	2	1	1	2
Proportion	38%	41%	44%	44%	50%	44%	44%	46%	38%	43%	43%	44%
2f) Train stations are conveniently located												
Mode	1	1	1	1	1	1	2	2	2	1	1	2
Proportion	32%	39%	40%	36%	45%	45%	38%	36%	32%	39%	41%	36%
2g) Bus journeys are pleasant												
Mode	0	0	0	1	0	0	1	1	1	0	0	1
Proportion	35%	32%	38%	35%	43%	47%	38%	34%	43%	38%	40%	37%
2h) Train journeys are pleasant												
Mode	1	1	1	1	0	1	1	1	1	1	1	1
Proportion	38%	44%	49%	39%	43%	46%	37%	42%	43%	45%	45%	41%
2i) The value for money of the bus ticket is generally satisfactory												
Mode	0	-1	0	0	-1	0	2	1	1	0	0	1
Proportion	33%	27%	36%	34%	28%	41%	31%	29%	30%	35%	36%	26%
2j) The value for money of the train ticket is generally satisfactory												
Mode	-1	-1	-1	0	-1	-1	0	0	0	-1	-1	0
Proportion	27%	30%	29%	34%	48%	32%	35%	26%	35%	29%	30%	31%
2k) In general, I think that successful people tend to travel by car rather than by bus												
Mode	2	2	2	2	0	1	2	2	2	2	2	2
Proportion	46%	32%	34%	44%	45%	33%	58%	46%	31%	35%	34%	46%
2l) In general, I think that successful people tend to travel by car rather than by train												
Mode	2	0	0	2	0	0	2	2	0	0	0	2
Proportion	35%	30%	31%	32%	55%	35%	43%	38%	32%	31%	31%	36%

A4.2 Perceived Risk of Accidents and Crime

The perceived risk of accidents and of crime whilst travelling by bike, bus, train and car across the individual treatment and control areas, as well as overall, were assessed by assigning a value of 1 to 4 to each mode as given by the respondents, where 1 is seen as the most safe, and 4 the least safe. Again, we recognise there are issues in using ordinal data in this way, and hence have calculated the mode and proportions of respondents who fall into each of the four opinion categories for the perceived risk of accident and a victim of crime, which are shown in Tables A4.4 and A4.5 respectively for the after survey. In the before survey, we found there were uniform trends between individual control and treatment areas, with cycling considered the riskiest form of travel for both accidents and personal security. Car is considered the second riskiest mode in terms of accidents, followed by buses, with trains the safest. Buses are generally considered the second riskiest form of travel in terms of personal security, followed by trains, with car considered the safest. Tables A4.4 and A4.5 show that there has again been little change in these rankings for the after survey.

Table A4.4: Perceived Risk of an Accident – by Area (After Survey)

(rated on a scale from 1 (most safe) to 4 (least safe))

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport	All Areas	Treatment	Control
Perceived Risk of Accidents (1=Most Safe; 4=Least Safe)											
Bikes											
Mode	4	4	4	4	4	4	4	4	4	4	4
Proportion	84%	94%	83%	89%	92%	90%	94%	88%	90%	89%	91%
Buses											
Mode	2	2	2	2	2	2	2	2	2	2	2
Proportion	50%	55%	47%	58%	58%	57%	62%	55%	56%	55%	58%
Trains											
Mode	1	1	1	1	1	1	1	1	1	1	1
Proportion	73%	75%	65%	76%	76%	78%	78%	70%	75%	74%	75%
Cars											
Mode	3	3	3	3	3	3	3	3	3	3	3
Proportion	44%	54%	49%	53%	55%	58%	67%	58%	56%	54%	60%

Table A4.5: Perceived Risk of Being a Victim of Crime - by Area (After Survey)

(rated on a scale from 1 (most safe) to 4 (least safe))

Perceived Risk of Victim of Crime (1=Most Safe; 4=Least Safe)											
Bikes											
Mode	4	4	4	4	4	4	4	4	4	4	4
Proportion	68%	68%	65%	67%	67%	64%	59%	70%	66%	68%	63%
Buses											
Mode	3	3	3	3	3	3	2	2	3	3	3
Proportion	45%	38%	37%	42%	41%	38%	37%	42%	38%	38%	38%
Trains											
Mode	2	2	2	2	2	2	2	2	2	2	2
Proportion	48%	46%	44%	46%	44%	43%	38%	42%	43%	44%	41%
Cars											
Mode	1	1	1	1	1	1	1	1	1	1	1
Proportion	64%	68%	64%	62%	64%	68%	65%	64%	65%	65%	65%

Overall, our attitudinal work has indicated that there are some substantial barriers to sustainable travel. For active travel, safety and security are considered key barriers, particularly for non-car owners. For public transport, value for money is the main concern, particularly for rail, and among car-owners. The social norm is seen as being that successful people tended to travel by car, with this being supported particularly strongly among non-car owners. These attitudes, and the perceived risks of accidents and crime, appear to be remarkably constant over time.

A4.3 Awareness of Transport Schemes

The respondents' awareness of LSTF-transport schemes was rated on a scale from 1 to 4, based on their survey responses, where 1 = not aware at all, 2 = partly aware, 3 = fully aware but not directly affected, and 4 = fully aware and directly affected. In the before survey, the levels of awareness were uniformly low across all the treatment and control areas, as shown in Table A4.6, which again provides the mode and relative proportion of the mode for the awareness of each initiative.

Table A4.6: Awareness of LSTF Interventions - Before Survey

(rated on a scale from 1 (not aware at all) to 4 (fully aware and affected))

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
a) Awareness of Public Transport Interchange Improvements								
Mode	3	1	1	1	1	1	1	1
Proportion	33%	56%	67%	79%	75%	78%	75%	52%
n =	319	405	215	358	459	492	612	498
b) Awareness of Bus Priority Measures								
Mode	1	1	1	1	1	1	1	1
Proportion	59%	67%	64%	78%	82%	76%	56%	40%
n =	315	401	212	356	453	493	610	494
c) Awareness of Demand Responsive Transport / Community Transport								
Mode	1	1	1	1	1	1	1	1
Proportion	62%	69%	75%	76%	83%	70%	81%	77%
n =	311	397	208	348	449	493	602	493
d) Awareness of Cycling Infrastructure Schemes								
Mode	1	1	1	2	1	1	1	1
Proportion	72%	79%	69%	40%	77%	58%	66%	49%
n =	306	400	209	352	452	488	604	494
e) Awareness of Car Sharing Schemes								
Mode	1	1	1	1	1	1	1	1
Proportion	73%	74%	71%	61%	75%	57%	74%	74%
n =	308	400	208	354	451	487	605	493
f) Awareness of College Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	85%	89%	80%	83%	89%	83%	88%	88%
n =	303	396	204	348	445	483	601	482
g) Awareness of Personalised Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	83%	85%	80%	87%	91%	86%	93%	86%
n =	303	396	204	350	447	488	599	487
h) Awareness of Workplace Travel Plan								
Mode	1	1	1	1	1	1	1	1
Proportion	86%	86%	78%	82%	88%	82%	88%	84%
n =	297	389	201	347	448	481	596	477
i) Awareness of Station Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	68%	80%	73%	91%	91%	85%	93%	90%
n =	307	400	207	350	450	488	598	484
j) Awareness of School Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	85%	89%	78%	85%	88%	83%	89%	89%
n =	298	390	204	349	447	480	596	482
k) Awareness of Area Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	76%	83%	77%	86%	89%	85%	88%	80%
n =	305	396	208	351	452	486	602	490

Table A4.6 shows that the main exception was for public transport interchange improvements in Greater Manchester, and particularly Rochdale (highlighted in yellow), where the largest proportion of respondents were fully aware although not directly affected by this policy intervention. In fact, over 80% of respondents were at least partly aware of this initiative, i.e. scored their awareness as greater than 1, although it should be noted that the new £11.5 million interchange was opened in Rochdale Town Centre on 17 November 2013, which coincided with the launch of our survey. Similarly, the proportion of respondents in Tameside who were aware of local station access improvements also seemed to be relatively high, with more than 44% stating that they were at least partly aware of this scheme. This compares to 67% of respondents in Wigan who were not aware at all of any such policy improvements. The proportion of respondents in Rochdale and Tameside who were at least partly aware of local demand responsive Transport improvements also seems relatively high, at more than 38% and 31% respectively, compared to 75% who were not aware at all in Wigan. There was also evidence of higher awareness of cycling infrastructure schemes in Coalville and bus priority measures in Gosport (both highlighted in yellow in Table A4.6), which reflected pre-November 2013 LSTF-related initiatives in these two locations. In the case of Coalville, most people were partly aware of the schemes, at 40%, with a further 33% being fully aware (either not affected or directly affected). In Gosport, more than 60% of respondents were at least partly or else fully aware of local bus priority measures, and similarly over 51% were at least partly or fully aware of cycling infrastructure improvements, and 48% for public transport interchange improvements. However, in all locations there was particularly low awareness of LSTF-related travel planning activity, even though such activities had commenced in some of our treatment areas (e.g. Coalville, Gosport), and there were some minor differences between individual treatment and control areas. This suggested that there was little diffusion, at least in the short-run, of these policies to the wider public to begin with, particularly of the secondary LSTF interventions. The results could also reflect the personalised nature of such travel planning, which typically target areas of highest need, and it is possible that while such neighbourhoods and workplaces were sampled, an insufficient proportion of the beneficiaries took part in the surveys.

Table A4.7 shows the awareness of the different transport improvements in the after survey, which indicates (compared to Table A4.6) there was very little change in the awareness of the LSTF measures generally. Indeed, the biggest change was in Hinckley with respect to cycling infrastructure schemes (shown highlighted in yellow), where the proportion of people who were not aware at all had dropped by more than 25%. Although we have designated Hinckley as a control area, it benefitted from LSTF measures from March 2015 onwards, and there may have been some attitudinal changes in advance of physical implementation. We suspect this was also a feature of our treatment areas in the before survey, particularly for Coalville, Gosport and Rochdale, i.e. some attitudinal (and therefore possibly behavioural) change may already have occurred during the period of the before survey. In addition, the slightly higher levels of awareness seen for some of the primary and secondary interventions in the treatment areas for the before survey, e.g. cycling infrastructure and car sharing in Coalville (shown highlighted), have now tailed off, and the proportion who were not aware at all has increased. In other words, there may be a lead effect, i.e. awareness can increase in advance of actual measures being implemented due to pre-publicity. There are also fewer differences found in the after survey for the awareness of secondary schemes. It should also be noted that the awareness of public transport interchange improvements in Wigan, Hinckley and Fareham (the control areas) have all increased (again highlighted). However, the level of awareness

in Rochdale remains higher than for Wigan in the after survey, and similarly Gosport as compared to Fareham. In the case for cycling infrastructure awareness between Coalville and Hinckley, while the proportion who were at least partly or fully aware in Hinckley has increased as compared to Coalville, the proportion of those who were more aware in the treatment area remains higher for the after survey.

Table A4.7: Awareness of LSTF Interventions - After Survey
(rated on a scale from 1 (not aware at all) to 4 (fully aware and affected))

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
a) Awareness of Public Transport Interchange Improvements								
Mode	3	1	1	1	1	1	1	1
Proportion	32%	57%	57%	80%	61%	74%	65%	49%
n =	321	400	216	358	453	494	615	502
b) Awareness of Bus Priority Measures								
Mode	1	1	1	1	1	1	1	1
Proportion	59%	68%	62%	77%	72%	74%	53%	41%
n =	317	401	213	355	453	496	609	502
c) Awareness of Demand Responsive Transport / Community Transport								
Mode	1	1	1	1	1	1	1	1
Proportion	66%	73%	72%	73%	82%	72%	81%	74%
n =	312	392	212	353	446	496	606	494
d) Awareness of Cycling Infrastructure Schemes								
Mode	1	1	1	1	1	1	1	1
Proportion	72%	78%	65%	42%	51%	59%	66%	51%
n =	312	394	210	353	450	493	605	494
e) Awareness of Car Sharing Schemes								
Mode	1	1	1	1	1	1	1	1
Proportion	73%	77%	68%	71%	72%	56%	75%	75%
n =	316	395	209	354	448	492	605	496
f) Awareness of College Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	84%	92%	80%	84%	88%	85%	87%	87%
n =	311	393	207	349	448	485	599	490
g) Awareness of Personalised Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	84%	92%	83%	86%	90%	87%	92%	86%
n =	314	394	208	353	450	480	603	490
h) Awareness of Workplace Travel Plan								
Mode	1	1	1	1	1	1	1	1
Proportion	83%	91%	83%	86%	87%	82%	86%	86%
n =	308	393	205	347	446	480	600	489
i) Awareness of Station Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	76%	84%	76%	91%	90%	85%	92%	90%
n =	312	395	209	350	448	488	604	491
j) Awareness of School Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	81%	91%	84%	85%	91%	83%	89%	90%
n =	306	394	203	348	443	485	602	490
k) Awareness of Area Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	77%	87%	81%	88%	88%	85%	85%	81%
n =	313	398	208	354	448	488	603	492

To explore this further, respondents' increase in awareness to specific primary and secondary interventions in each area was analysed. Any increase in awareness was tested through the same 11 questions contained in both the before and after surveys, as shown in Tables A4.6 and A4.7 above (and numbered a to k), but specifically to reflect the primary and secondary interventions for each treatment area (and corresponding control area) as given in Table A1.1. The questions covered:

a) Awareness of Public Transport Interchange Improvements*;

b) Awareness of Bus Priority Measures;

c) Awareness of Demand Responsive Transport/Community Transport;

d) Awareness of Cycling Infrastructure Schemes**;

e) Awareness of Car Sharing Schemes;

f) Awareness of College Travel Plans;

g) Awareness of Personalised Travel Plans;

h) Awareness of Workplace Travel Plan***;

i) Awareness of Station Travel Plans;

j) Awareness of School Travel Plans; and

k) Awareness of Area Travel Plans.

* including sustainable access to Metrolink/rail and improved Hyde/Hattersley station access;
** including improved cycle links and cycle hubs;
*** including wheels to work and business surveys.

As the awareness of each scheme is rated on a scale from 1 to 4 (as discussed further above), the year-on-year change in awareness between the before and after surveys potentially ranged from a minimum of -3 through zero (or no change) to a maximum of +3. (Note that the awareness of smart card schemes was not tested in the surveys.) It was agreed that those who demonstrated a year-on-year change in score of *+1 or more* in the relevant primary and/or secondary intervention question(s) would be classed as showing an increase in awareness of the local LSTF scheme(s), as this assumes the respondent had made a conscious decision that their level of awareness of a particular scheme has increased year-or-year, e.g. from not aware at all, to partly aware or fully aware, and this is not dependent on the intervals between the different scores (or levels of opinions). The awareness questions were then mapped to the appropriate local LSTF scheme as per Table A1.1. For example, a +1 or more change in score between the before and after survey for question (d) (awareness of cycling infrastructure) represented an increase in awareness by the respondent of the primary LSTF intervention in Coalville, while a positive change in score for any of the questions (e), (g) (h) and/or (j) represented an increase in awareness of the secondary interventions in the same treatment area. Similarly, positive changes to question (a) (interchange) reflected increased awareness of the primary intervention in Eastleigh, while increases to questions (b) (f) (i) (k) reflected those of secondary ones, and so forth. (Note: those who did not respond to *all* these questions in either the before and/or after survey are ignored, although this represents less than 4.1% of all the respondents across the treatment and control areas combined.)

Figure A4.1 shows the proportions of those who had increased their year-on-year awareness of the specific primary and/or secondary interventions in each treatment (and associated control) area. It should be noted that the awareness questions were asked in general terms (see Annex A), without

them being leading by making specific reference to the LSTF. However, it is recognised this could also result in some false positives for respondents surveyed in the control areas, where there may be an increase in awareness due to other schemes outside the LSTF, and which is reflected in Table A4.7 above. While these control areas were originally selected due to their lack of planned sustainable transport interventions, it later became apparent that they were also subjected to transport interventions, which are reflected in the results shown in the rest of this Appendix.

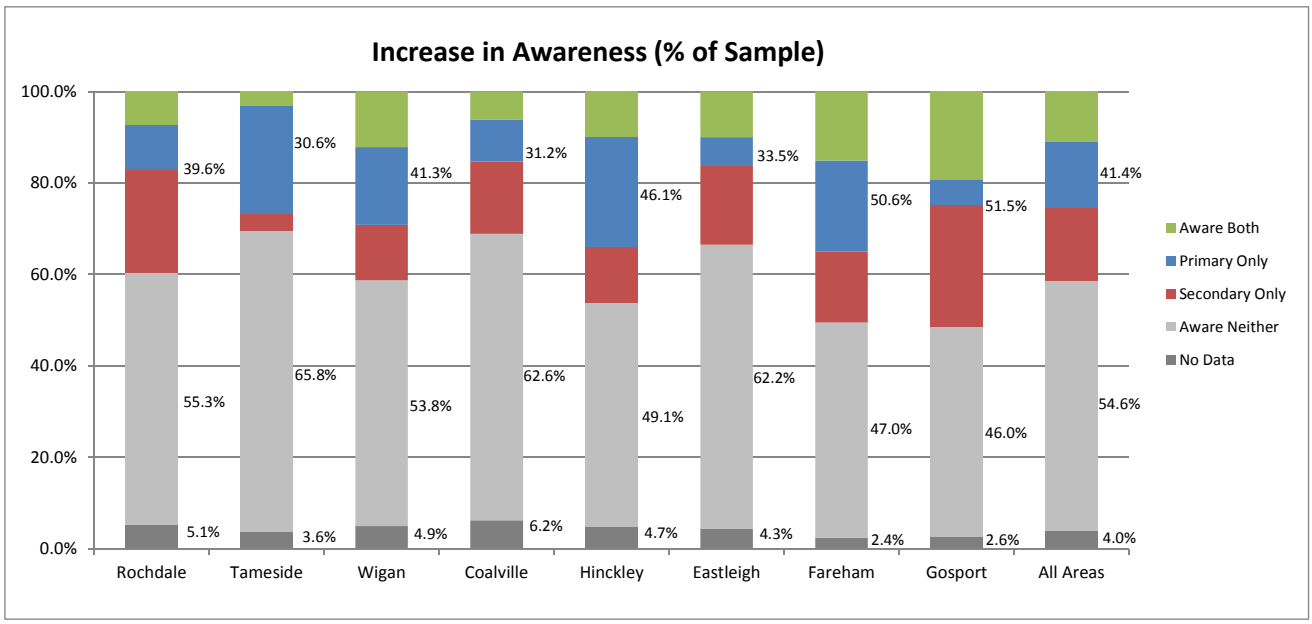


Figure A4.1: Increase in Awareness of Primary and/or Secondary Interventions by Area

Figure A4.1 shows that over a third of all respondents in the treatment areas (Rochdale, Tameside, Coalville, Eastleigh and Gosport) exhibited increased awareness of the primary and/or secondary interventions. However, in four out of five treatment areas a greater number were aware of the changes in the secondary measures, rather than the primary (or physical) measures. The exception is in Tameside, where Personalised Travel Planning took place in Audenshaw (just outside the surveyed area), although this could nevertheless have impacted on some of those surveyed, whilst Workplace Travel Planning activity was also limited. In addition, awareness of sustainable transport schemes appeared to have increased in the control areas as well as in the treatment areas, and this could reflect LSTF schemes that were started before or during the period of the after survey, as was the case in Hinckley, or they are a consequence of other local sustainable transport-related changes.

A difference-in-differences (DiD) approach was again applied to compare the mean changes in awareness of specific primary and secondary LSTF interventions in each treatment and its paired control area, as summarised in Table A4.8, where:

DiD = Δ Treatment Area – Δ Control Area,

and Δ = Change in awareness for the specific intervention in the Area (After Survey minus Before).

Table A4.8: DiD Changes in Awareness of LSTF Interventions

Awareness DiD - Treatment vs Control Areas*	Coalville vs Hinckley	Eastleigh vs Fareham	Gosport vs Fareham	Rochdale vs Wigan	Tameside vs Wigan
Primary Intervention(s) :					
Interchange Improvements		-0.1		**-0.4**	**-0.2**
Bus Priority			-0.1		
Demand Responsive Transport					-0.0
Cycle Infrastructure	**-0.5**				
Secondary Interventions :					
Interchange Improvements			-0.1		
Bus Priority		-0.0			
Demand Responsive Transport				0.0	
Cycle Infrastructure			0.0	0.0	
Car Sharing	**-0.2**				
College Travel Plans		-0.1			
Personal Travel Plans	-0.0		-0.0	0.1	-0.1
Work Travel Plans	-0.0			**0.2**	0.0
Station Travel Plans		-0.0			
School Travel Plans	0.0				
Area Travel Plans		-0.1	-0.0		

* The Difference-in-Differences is calculated as: DiD = Δ Treatment Area(s) – Δ Control Area(s), where Δ = Change in awareness of the intervention (After survey minus Before)c

Note - Bold indicates statistically-significant difference between the Treatment and its corresponding Control distributionscThe DiD in the means shown may be subject to rounding errorc

Table A4.8 shows that, in general, there was very little difference in terms of the year-on-year change in awareness of the LSTF interventions between the individual treatment and control areas, with the notable exceptions being:

- a significant DiD increase in awareness of both cycling infrastructure and car sharing schemes in Hinckley, as compared to minor reductions in Coalville;
- a significant DiD increase in awareness of public transport interchange improvements in Wigan, as compared to both Rochdale and Tameside, where there are small reductions;
- a significant DiD increase in work travel planning in Rochdale as compared to Wigan, where there is a minor reduction. This could relate to initiatives on the Kingsway Industrial Estate.

These results show that, while initial awareness of local cycling infrastructure schemes in Coalville (the primary measure) was higher in the before survey than for other areas, this has since reduced in the after survey, and is almost matched by an increased level of cycling intervention awareness in Hinckley, which is attributed to a recent development of such schemes in the area. Similarly, the higher awareness of public transport interchange improvements reported for Rochdale in the before survey has since been overshadowed by ongoing customer dissatisfaction with local rail services as previously discussed (see Appendix A2.7). This compares to an increase in the awareness of interchange improvements in Wigan, which could be due to the continued development of the 'Wigan Transport Hub' during 2014, e.g. with the completion of 'super' bus stops in the town centre, as well as rail infrastructure improvements arising from line and service upgrades, particularly for those into Manchester. Nonetheless, the awareness of interchange improvements remains relatively high in Rochdale as compared to Wigan and other treatment areas (see Tables A4.6 and A4.7), while the awareness of workplace travel planning has increased year-on-year compared to DiD decreases elsewhere.

Interestingly, the year-on-year increase in awareness of car-sharing schemes in Hinckley does not appear to have resulted in an immediate year-on-year increase in car passenger miles travelled per person per week (Table A2.4), whereas this has increased in Coalville, which showed a relatively high degree of awareness for car sharing schemes during the before survey (see Table A4.6), which has

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since tailed off (Table A4c7)cThis suggests there could be a lag between when people become aware c of these transport schemes, and any discernible changes in their travel behaviour, if at all, c iœcattitudinal changes may oc ur in advance of physical implementations, whereas travel behaviour c hange may take a longer time to realisecThis was also evidenced by findings from the Gosport focus c group, which mentioned the benefits of a new ferry service to the Isle of Wight, even though this c service had yet to begin operationsc[7] As discussed previously, it is also possible that some behaviour c hange may have already oc urred at the time of the before survey, as some schemes started prior c to this, which may be associated with the slightly higher levels of awareness in these schemes at the c outsetcc

Given these awareness findings, along with the entrenched attitudes and barriers to sustainable c travel (see section A4c1 and A4c2 above), it is not surprising to find little difference in the c self-reported behaviour change of respondents between the before and after surveys (where 1 is c rated by respondents as 'my behaviour did not change', 2 is 'my behaviour changed a bit' and 3 is c 'my behaviour changed a lot')cTable A4c9 shows the mode and proportion of the mode for the c reported behaviour change by individual area attributed to the different LSTF schemescThis is c reported by respondents as generally negligible across the board, although nearly 31% reported that c their behaviour changed due to Public Transport Interchange Improvements in Rochdale (highlighted c in yellow), which is higher compared to WigancThere are also slightly higher proportions for c perceived behaviour change in Gosport due to public transport improvements, bus priority measures c and cycling infrastructure (also highlighted), that varies between 14 to 20% and which are all higher c than Farehamc c

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[7] Scoot Ferries began operating a Portsmouth to Cowes Ferry Service on 5 November 2015, although this c service ceased operating on 19 Decembercc

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Table 4.9: Reported Perceived Changes in Travel Behaviour

(rated on a scale from 1 (my behaviour didn't change) to 3 (my behaviour changed a lot)) c

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
a) Change due to Public Transport Interchange Improvements								
Mode	1	1	1	1	1	1	1	1
Proportion	69%	84%	89%	95%	86%	91%	90%	80%
n =	314	388	208	348	437	490	599	491
b) Change due to Bus Priority Measures								
Mode	1	1	1	1	1	1	1	1
Proportion	83%	91%	90%	91%	91%	92%	88%	80%
n =	311	382	204	348	439	487	600	488
c) Change due to Demand Responsive Transport / Community Transport								
Mode	1	1	1	1	1	1	1	1
Proportion	90%	96%	95%	95%	96%	95%	97%	96%
n =	304	380	203	346	436	483	584	475
d) Change due to Cycling Infrastructure Schemes								
Mode	1	1	1	1	1	1	1	1
Proportion	93%	98%	88%	85%	88%	93%	92%	86%
n =	304	378	200	342	435	479	586	481
e) Change due to Car Sharing Schemes								
Mode	1	1	1	1	1	1	1	1
Proportion	94%	99%	94%	97%	96%	97%	99%	97%
n =	303	377	200	343	434	480	586	472
f) Change due to College Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	95%	99%	94%	97%	98%	98%	99%	97%
n =	299	375	198	340	430	476	582	470
g) Change due to Personalised Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	90%	96%	92%	96%	95%	95%	98%	94%
n =	304	378	200	343	432	481	584	473
h) Change due to Workplace Travel Plan								
Mode	1	1	1	1	1	1	1	1
Proportion	94%	97%	93%	98%	96%	97%	98%	97%
n =	300	376	200	340	430	473	584	471
i) Change due to Station Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	89%	94%	93%	97%	97%	98%	98%	98%
n =	303	376	203	342	431	480	585	472
j) Change due to School Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	96%	99%	96%	98%	98%	99%	98%	98%
n =	298	372	199	340	429	472	582	469
k) Change due to Area Travel Plans								
Mode	1	1	1	1	1	1	1	1
Proportion	91%	94%	93%	97%	95%	97%	96%	95%
n =	299	374	200	342	430	475	586	473

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Some of these modest, self-reported indications of behaviour change are reflected in respondents' c weekly travel diaries for the time and distances they travelled year-on-yearcHowever, overall, c we have found that travel attitudes have remained remarkably constant between the before and c after surveys in both the treatment and control areas, which is reflected in the travel diary datacc Similarly, we have found no evidence of differential changes in attitudes between Thornton et alc's c nine market segments in the before and after surveys, although we did find some differences in c travel behaviour change as discussed in Appendix 3cThe next section will look at whether c respondents who were aware of the sustainable transport schemes did in fact change their travel c behaviour as reported through their travel diariescc

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A4.4 Awareness and Impact on Travel Behaviour

The previous section had shown that respondents in the treatment areas were aware of some of the LSTF interventions taking place during the time of the before survey, although they may not have necessarily recognised these specifically as such. The subsequent DiD awareness analysis also showed some year-on-year increases for specific schemes in the treatment areas, although the results are clouded by corresponding increases in awareness due to similar and more recent schemes being implemented in the control areas.

An analysis was therefore conducted to assess the complementarity of increases in awareness to the year-on-year changes in weekly travel behaviour as reported in Appendix 2. A difference-in-differences approach was again adopted, comparing those in the treatment areas who became more aware, i.e. had exhibited a year-on-year increase in awareness for both the primary and secondary interventions associated with a particular area, against those who did not, in terms of the effects this had on their year-on-year change in weekly distances travelled across the different modes. A separate comparison of these effects was also made against the respondents from the control areas, and this is shown in Table A4.10.

Table A4.10: DiD Changes in Distances Travelled

(Aware Respondents in the Treatment Areas versus their corresponding Controls)

Travel DiD - Increase in Awareness of both Primary and Secondary Interventions*	Coalville vs Hinckley	Eastleigh vs Fareham	Gosport vs Fareham	Rochdale vs Wigan	Tameside vs Wigan
Walking	5.7	-0.9	-0.1	0.5	2.1
Cycling	0.5	0.2	1.2	-1.6	-0.6
Bus Travel	30.6	**4.7**	0.9	0.5	2.4
Train Travel	8.3	**20.1**	-4.2	-10.4	-10.4
Car Driving	-1.4	-11.4	-26.3	-24.4	5.3
Car Passenger	-13.5	3.4	10.1	**32.4**	15.4
Other Modes	1.3	-10.3	1.8	5.6	-67.3
Active Travel**	6.2	-0.8	1.1	-1.0	1.5
Public Transport**	38.9	**24.7**	-3.4	-9.9	-8.0
Sustainable Travel**	45.1	**23.9**	-2.3	-10.9	-6.5
All Car Travel**	-14.8	-8.0	-16.2	7.9	20.8
All Travel (including Other Modes)	31.6	5.6	-16.7	2.5	-53.0

* The Difference-in-Differences is calculated as: DiD = Δ Respondents whose awareness of Primary and Secondary Interventions has increased – Δ Respondents in the comparison Control Area, c

where Δ = Change in distance travelled per mode per week (After Survey minus Before)c

** 'Active Travel' includes Walking and Cycling; 'Public Transport' includes Bus and Train Travel; 'Sustainable Travel' is the combination of Active Travel and Public Transport, while 'All Car Travel' includes Driving and Car Passengerc

Note - Bold indicates statistically-significant difference between the Treatment and its corresponding Control distributionscThe DiD in the means shown may be subject to rounding errorc

Note that the sample sizes for 'aware' respondents in Coalville, Rochdale and Tameside are relatively small (n=23, 2c and 12 respectively)c

Table A4.10 shows a significantly positive DiD in both bus and train travel for Eastleigh, which resulted in knock-on positive DiDs for public transport and sustainable travel. In addition, Rochdale showed a significantly positive DiD for car passenger travel, which is partly offset by a reduction in car driving, as well as a reduction in train use (as discussed previously), although neither of these changes are significant. The positive change in car passenger travel (when associated with a negative DiD in car driving) suggests some effects possibly from Demand Responsive Transport, and Personal and Workplace Travel Planning, although it should be noted that the sample size for these 'aware' respondents in Rochdale is relative small (n=24). Nonetheless, as a consequence, the results no longer show widespread DiD trip suppression across all the treatment areas, as was seen previously in comparing aggregated treatment and control areas (Tables A2.5 and A2.11). The DiD comparison between those who were more aware of both the primary and secondary interventions against those who were not aware of either within the same treatment area showed similar results, and these are shown in Table A4.11. Here it should be noted that there was a significant change in

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the use of car passenger in Coalville but, contrary to earlier expectations, this was due to a reduction in the use of this mode by those who were most aware of the LSTF initiatives.

Table A4.11: DiD Changes in Distances Travelled

(Aware Respondents in the Treatment Areas versus Non Aware Respondents)

Travel DiD - Increase in Awareness of both Primary and Secondary Interventions*	Coalville	Eastleigh	Gosport	Rochdale	Tameside
Walking	6.8	-1.8	-0.3	1.2	1.7
Cycling	-0.	0.3	1.6	-0.9	-2.5
Bus Travel	32.9	3.2	-2.8	5.2	1.8
Train Travel	3.3	**14.7**	1.7	2.8	-. 5
Car Driving	-. 6	-. 0	10.1	-27.0	1.0
Car Passenger	**-26.6**	1.1	5	26.7	15.1
Other Modes	17.3	0	-33.5	9	**-68.8**
Active Travel**	6	-1.5	1.3	0.3	-0.8
Public Transport**	36.2	**17.9**	-1.0	8.0	-2.7
Sustainable Travel**	2.5	**16.4**	0.3	8.3	-3.5
All Car Travel**	-31.2	-2.9	1. 5	-0.3	16.1
All Travel (including Other Modes)	28.6	17.5	-18.7	12.8	-56.2

* The Difference-in-Differences is calculated as: DiD = Δ Respondents whose awareness of Primary and Secondary Interventions has increased – Δ Respondents Not Aware of Either Interventions, in the same Treatment Area,
where Δ = Change in distance travelled per mode per week (After Survey minus Before)

** 'Active Travel' includes Walking and Cycling; 'Public Transport' includes Bus and Train Travel; 'Sustainable Travel' is the combination of Active Travel and Public Transport, while 'All Car Travel' includes Driving and Car Passenger

Note - Bold indicates statistically-significant difference between the Treatment and its corresponding Control distributions. The DiD in the means shown may be subject to rounding error

Note that the sample sizes for 'aware' respondents in Coalville, Rochdale and Tameside are relatively small (n=23, 2 and 12 respectively)

In conclusion, there seems to be a stronger correlation between increases in awareness of the LSTF primary and secondary schemes, and its effects on increasing respondents' use of public and sustainable transport, than that which is borne out by conducting a proximity (or dosage) analysis of respondents living closer to the LSTF interventions (Appendix A2.7), which showed wider variations, even within the two treatment areas that were analysed.

The relationship between increased awareness and greater sustainable travel is particularly true in the case of Eastleigh, where year-on-year bus use has been maintained, while year-on-year train travel has increased significantly relative to that of Fareham, where year-on-year bus travel has conversely fallen. However, while there are general trends that car driving has decreased across most treatment areas compared to their controls, these results are not significant, and there is no DiD evidence to show that increases in sustainable transport are necessarily complemented by similar reductions in car travel.

The presence of sustainable transport schemes being implemented (or having been implemented) in the control areas also make DiD comparisons more problematic, although this would have been difficult to foresee at the outset. Such schemes appear to have had an effect on promoting sustainable travel and/or reducing car travel in the control areas, particularly in the case of Wigan and Hinckley, which offset those experienced in the treatment areas. There also appears to be a lag between when respondents are made aware of sustainable transport schemes, and when there is any noticeable change in their behaviour, possibly due to the time for these schemes to come to fruition, which tend to be longer in the case of physical measures. It is also possible that some changes towards sustainable travel had already taken place even at the time of the before survey, due to some LSTF interventions having taken place, which is also reflected in the higher levels of awareness in the LSTF-related measures initially in the treatment areas versus their controls.

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Feedback from the initial (201c) focus groups also suggested that the benefits of some LSTF-schemes c may be relatively localised, and they needed to be part of a wider coordinated strategy of measures c that collectively encouraged and sustained more widespread changecFor example, the awareness of c local cycling improvements in one area was said to be good, but people felt there was still a lack of c ycle parking facilities in the centre, and that the existing schemes were seemingly piecemeal in c nature, egca new segregated cycle route would suddenly stop, and cyclists would then be c onfronted with either joining perceived dangerous road traffic or else be forced to cycle on the c pavementc The cycling infrastructure provided was also said to be inconsistent, with some paths c being segregated from traffic, while others were either combined or segregated from pedestriansc c In turn, participants who were pedestrians said they were weary of oncoming cyclists, and that all c infrastructure and signage should make clear who had priority, as well as encourage respect c between cyclists and pedestrians, as well as other road users at traffic junctionsc c

All these factors may therefore collectively contribute towards explaining why the year-on-year DiD c hanges in sustainable travel behaviour as measured by the primary surveys were relatively modest, c and only significant in placescThe results also suggest that future sustainable transport schemes c need to comprise a coordinated package of both physical and softer measures that both raised c people's awareness of the interventions, as well as encouraged changes in travel behaviourcc Nonetheless, the next Appendix will look at the year-on-year impact of these relatively modest c DiD changes in weekly travel behaviour on carbon emissionscc

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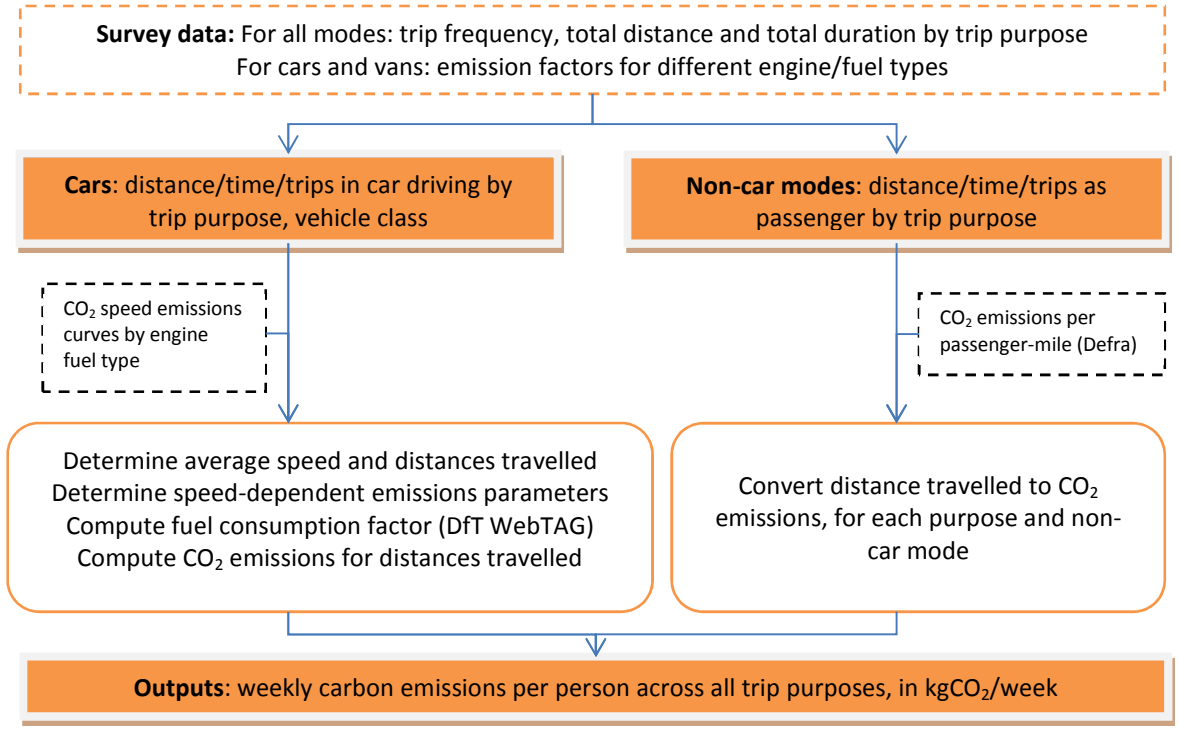
Appendix 5: Greenhouse Gas Emissions

We have used the travel activity data described in the preceding sections along with household car information to derive greenhouse gas emissions, as measured in carbon dioxide equivalents (CO_2e), and which includes carbon dioxide. The methods differ for car and non-car modes. Figure A5.1 explains how CO_2e could be measured using the travel diary information. First, for travel by public transport (principally bus and train), self-reported data on distance travelled by trip purpose will be multiplied by mode-specific, average emissions factors. Second, for household cars and vans, the self-reported data on trip frequencies and duration, as well as average emissions factors for different vehicle fuel types, allows the use of a more disaggregate method.



Source: Based on Brand et al. (2013)

Figure A5.1: CO_2 emissions calculation methods for cars and other motorised modes

After calculation of individual CO_2e emissions in the before and after surveys, we will compare aggregate levels of CO_2 equivalent emissions between the different treatment and control areas. Our work will therefore broadly follow that of Brand et al. (2013) undertaken for iConnect but will also follow current best practice in terms of the average speed approach advocated by the Department for Transport in WebTAG (2014) for cars and vans, and the DEFRA (2013) Greenhouse Gas (GHG) emission factors to account for buses and trains.

For cars and vans, the WebTAG method (as at January 2014) involves estimating the tonnes of CO_2 equivalent (CO_{2e}) emitted from the fuel consumption of vehicles. The fuel consumed is calculated using a formula of the form:

$$L = (a / v) + b + (c * v) + (d * v^2)$$

where: L is the fuel consumption in litres per kilometre;
v is the average speed of the vehicle in kilometres per hour;
and a, b, c, d are parameters supplied by the DfT, which depend on the type of vehicle, i.e. whether it is petrol or diesel engine.

The process (DfT, 2014) then multiplies the calculated fuel consumed per kilometre travelled (*L*) by the marginal emissions factor per litre of fuel burnt, and the distance travelled. The marginal carbon emissions factors are derived from the Department of Energy and Climate Change (DECC), with separate factors for petrol and diesel engines. However, the 'standard' fuel consumption calculation does not require knowledge of either the engine or vehicle size, or age of the vehicle, although it is possible these may be factored into the speed or parameters calculation.

The produced emissions value is then expressed in units of CO_2e, as the marginal emission factors include the impact of nitrous oxide (N_2O) and methane (CH_4), as well as CO_2. The marginal emissions factors (for both petrol and diesel) also have a baseline Year of 2010, and WebTAG provides updated values for 2013 (i.e. for the year of the before cohort survey) based on assumptions of increased use of renewable fuels and reduced emissions in later years compared to 2010.

For the purpose of this estimation, the fuel consumption parameters deployed will either be for a 'Petrol Car' or 'Diesel Car', with no distinctions being made between the size of cars and vans, i.e. the parameters for LGVs will not be used. For simplicity, the emissions emanating from 'Other' types of vehicles and modes of transport (as stated in the respondents' Travel Diary) have been ignored, as these form a relatively small proportion of the overall trips that had been undertaken. However, while the consumption of electric, hybrid and other engine vehicles is relatively small (see analysis further below), it is recognised that other journeys made by van (where these have been put into the 'Other' category by respondents), as well as air travel, could incur significant distances in travel, and therefore additional CO_2e emissions. The vehicle distances travelled is based on the data from respondents' Travel Diary entries for the number of miles driven by car for all journey purposes. As the Travel Diary is over a 7-day period, this value is multiplied by 52 to obtain the annual mileage driven in miles, and this in turn is multiplied by 1.6 to derive the annual kilometres driven. The mileage for each respondent is then added to each treatment or control area, and the total fuel consumption is calculated based on whether the respondent owns a petrol or diesel car. Where the fuel type of the car is not stated by the respondent, the car driven is assumed to be petrol (see below also). The total annual carbon emissions for each area (in tonnes CO_2e) is then calculated from the total (weighted) annual mileage driven by respondents using the WebTAG recommended calculation discussed above.

For buses and trains, the calculation of carbon emissions is based on the number of passenger kilometres travelled, as suggested by DEFRA (2013). For the Carbon Case Study, the total annual passenger distances travelled is derived using the same method as for car mileage driven, except this uses the miles travelled by bus or train in the respondent's Travel Diary entries. This passenger kilometres travelled is then converted to kg CO_2e per annum using a set of emission conversion factors as supplied by DEFRA (2013). Given the study areas, the emission conversion factor for 'Local Bus outside London' will be used, while the 'National Rail' conversion factor will be used for all distances travelled by train.

For each treatment or control area, the aggregate annual carbon emissions is derived by summing the total emissions from car/van, bus and train travel for all the respondents from that area.

A5.1 Ownership of Different Vehicle Types

Respondents were asked to specify the fuel type of the principal vehicle they used in the household, which could be either a Private or a Company Car. Table A5.1 shows the breakdown of the different vehicle fuel types used by respondents overall, although it should be noted that some of the non-car owners had access to a company or other car, and not all respondents stated the engine/fuel type, in which case petrol was assumed for emissions calculation purposes (this being the more common vehicle fuel type among private individuals).

Table A5.1: Breakdown of Vehicle Types (Fuel)

	Vehicle Type:	Count:	% of stated
	Petrol	1937	62.8%
	Diesel	1123	36.4%
Other fuel (see breakdown below)		26	0.8%
	Missing (not stated)	360	
	Total:	3446	
	Other Fuel, which comprise:		
Hybrid (petrol + battery/electric)		18	
	Gas or LPG Only	5	
	Electric	2	
	Biofuel	1	
	Total:	26	

Table A5.1 shows that, of those who stated the fuel type, 62.8% of the cases involved a petrol-driven car, while 36.4% of respondents used a diesel car. The use of other fuels in vehicles accounted for less than 0.8% of the respondents, and this predominantly involved hybrid petrol/electric engines.

A5.2 Carbon Emissions

Our focus has been on individual travel patterns, although to avoid issues of double counting we have attributed all car emissions to the driver. As described earlier, the estimation method involved calculating the changes in carbon dioxide equivalent emissions resulting from year-on-year changes in weekly travel distances and mode splits. However, this method will not be able to provide a detailed assessment of any rebound effects. For example, where a LSTF intervention encourages less use of the car and more use of walking and cycling, the monetary savings could be spent on carbon intensive activities elsewhere in the economy, such as overseas flights undertaken outside our survey period. Furthermore, the car that is no longer being used might simply be transferred to use by another household member.

Table A5.2 shows the breakdown of CO_2e emissions across the treatment and control areas as well as the total overall, and comparing the average per person between the before and after surveys. (Note that the emissions from Wigan and Fareham are double weighted to provide like-for-like aggregate comparisons between the five treatment areas and three control areas.) The total mean travel emissions in the after survey are 1.69 tonnes CO_2e per person per annum, with 93% of this related to car and van travel. However, we find that the carbon emissions per person are 28% higher in the control areas compared to the treatment areas, with 1.89 tonnes CO_2e per person per annum, versus 1.48.

Table A5.2: Summary of Changes in Carbon Emissions (tonnes CO_2e per annum)

	Treatment Areas		Control Areas*		Total*	
n =	2,134		2,158		4,292	
	(Tonnes CO2e)	% contribution	(Tonnes CO2e)	% contribution	(Tonnes CO2e)	% contribution
Cars/Vans Total:	2,901	92%	3,793	93%	6,694	93%
Buses Total:	126.10	4%	66.96	2%	193.05	3%
Trains Total:	126.12	4%	221.55	5%	347.67	5%
Total Annual Emissions:	3,153	100%	4,082	100%	7,235	100%
Average per person (After Survey):	**1.48**		**1.89**		**1.69**	
Average per person (Before Survey):	**1.50**		**1.86**		**1.68**	
Before and After Change:	**-0.022**		**0.028**		**0.004**	
%:	-1.4%		1.5%		0.2%	
DiD:	**-0.05**					
%:	-3.3%		* weighted to provide 1-for-1 comparison between the Treatment and Control Areas			

Table A5.2 also shows there has been relatively little change in carbon emissions overall - being 1.68 tonnes CO_2e per person per annum in the before survey. However, there has been a small reduction in the treatment areas, while there has been a small increase in the control areas, so that using a difference-in-differences approach, there has been a decline of 0.05 tonnes per person per annum, or a 3.3% reduction of the before emissions levels. However, these changes are not statistically significant.

Table A5.3 provides a further breakdown by individual survey areas. It can be seen that, using the difference-in-differences method (comparing individual treatment with their respective control areas), there are reductions in carbon emissions per person per annum for three of the five treatment areas (Gosport, Hyde and Rochdale), ranging from around 9% to 15% of the before emissions levels. However, there are also increases in carbon emissions per person in two areas (Coalville and Eastleigh), ranging from 3% to 8% of the before emissions levels. In the case of Eastleigh, this shows that the previously noted year-on-year increase in train travel has not resulted in any significant mode shift away from the motor car, i.e. that the mean weekly distance travelled by car has also increased year-on-year, and therefore the mean total distance travel has also increased.

Table A5.3: Changes in Carbon Emissions by Survey Area (tonnes CO_2e per annum)

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport
n =	331	412	223	372	466	510	623	509
	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)	(Tonnes CO2e)
Cars/Vans Total:	319	566	287	556	854	798	1,183	661
Buses Total:	15.96	26.57	11.36	19.24	10.34	23.00	16.94	41.33
Trains Total:	11.07	24.51	24.16	4.79	28.69	64.94	72.27	20.80
Total Annual Emissions:	347	618	323	580	893	886	1,272	723
Average per person (After Survey):	**1.05**	**1.50**	**1.45**	**1.56**	**1.92**	**1.74**	**2.04**	**1.42**
Average per person (Before Survey):	**1.05**	**1.51**	**1.32**	**1.60**	**2.08**	**1.62**	**1.98**	**1.59**
Before and After Change:	**-0.01**	**-0.01**	**0.12**	**-0.04**	**-0.16**	**0.12**	**0.07**	**-0.17**
%:	-0.7%	-0.6%	9.3%	-2.4%	-7.8%	7.1%	3.3%	-10.5%
DiD:	**-0.13**	**-0.13**		**0.12**		**0.05**		**-0.23**
%:	-12.4%	-8.8%		7.8%		3.1%		-14.7%

Note: Car/van totals exclude other (not petrol or diesel) engine types, and missing values are treated as 'petrol' by default. For total emissions, respondents may travel by more than one mode.

These results are affected by the changes in driving speeds across the different survey areas, as shown by Table A5.4.

Table A5.4: Changes in Car Driving Speeds by Survey Area

	Rochdale	Tameside	Wigan	Coalville	Hinckley	Eastleigh	Fareham	Gosport	Total
mph									
Before	19.5	20.6	22.7	23.9	26.6	23.9	24.5	20.2	23.1
After	18.4	20.3	21.0	22.7	25.6	24.4	26.7	20.0	23.1
Change	-1.1	-0.3	-1.8	-1.2	-1.0	0.5	2.2	-0.2	0.0
DiD	0.7	1.4		-0.2		-1.7		-2.4	

Compared to the control area of Wigan, both Rochdale and Tameside exhibit relative increases in car driving speeds. Compared to their control areas of Hinckley and Fareham respectively, Coalville and Eastleigh exhibit relative reductions in speeds. These cases are also indicative of a positive association between congestion and carbon emissions. However, by contrast, Gosport exhibits a relative reduction in speeds compared to Fareham, but also reductions in carbon emissions, which suggests there could be some wider behavioural change in this treatment area. However, these behaviour changes are not statistically significantly in the DiD analysis described in Appendix 2, largely due to the wide individual-level variations in travel patterns. However, the mean weekly distance driven per person by car appears to have decreased year-on-year, while bus travel has increased, and the reported level of behaviour change in Gosport (see Table A4.9) as well as the awareness of primary and secondary LTSF schemes in the before survey (Table A4.6) were both significantly higher than Fareham, albeit modestly in these cases.

Appendix 6: Secondary Data and Interventions

A6.1 Travel Flows and Journey Times

An aggregate figure for the average 24-hour two-way flows for each of the case study areas is provided by combining data from DfT road traffic estimates[8] with the Local Authorities' permanent traffic counter data[9]. A summary of the available count data is given in Table A6.1.

Table A6.1: Summary of count sites in each area

Case study area	DfT count sites	LA count sites
Eastleigh	5	1
Gosport	3	2
Lock's Heath (W Fareham)	5	1
Coalville	4	7
Hinckley	4	10
Hyde/Hattersley	8	0
Rochdale	8	0
Wigan*	11	1

* Note: 3 sites in Wigan ceased reporting data in 2013 and have since been removed from these analyses.

The count site locations for the case study routes in the Solent Transport area are summarised in Table A6.2. As is evident, there are only four sites within the Hampshire County Council (HCC) network which are suitable for inclusion in these analyses, so there is more reliance on the potentially less accurate DfT estimate data.

Data is currently available from 2008 to 2014, and analyses compare the trend over time, using 2012 data as a baseline index figure (2012=100) showing changes since 2008.

[8] For DfT estimates in the Solent Transport, for example, there are 53 count locations in Portsmouth, 51 in Southampton, and over 100 in the wider South Hampshire area. These annual road traffic estimates are mainly based on around ten thousand manual counts, which are combined with ATC data and road lengths to produce overall estimates. DfT guidance suggests that these National Road Traffic Estimates data are unlikely to provide an accurate representation of traffic trends at an individual site; however, aggregation of DfT and HCC data provides a good estimate of the changes in traffic in each corridor group. Data is available from http://www.dft.gov.uk/traffic-counts

[9] For example, HCC and SCC have 51 permanent counters located in South Hampshire (22 vehicle only, 6 vehicles and cycles, 19 cycles only, 2 not configured, 2 cycles not in use)

Table A6.2: Count sites used to derive traffic flow estimates in the Solent Transport area

Case study area	Site location	
West Fareham (control)	DfT	A27 (site 6293)
	DfT	A27 (site 26041)
	DfT	A27 (site 26297)
	DfT	A27 (site 56260)
	DfT	A3051 (site 78277)
	HCC	A27 Locks Heath
Eastleigh	DfT	A335 (site 6932)
	DfT	A335 (site 28148)
	DfT	A335 (site 38203)
	DfT	A335 (site 73610)
	DfT	A335 (site 78174)
	HCC	B3037 Bishopstoke Rd
Gosport	DfT	A32 (site 6345)
	DfT	A32 (site 46351)
	DfT	A32 (site 56318)
	HCC	A32 Gosport Rd
	HCC	B3334 Stubbington

Leicestershire County Council produces an annual 'Transport Trends' report, including market town cordon surveys of Coalville and Hinckley. There are 7 count sites in Coalville operational since 2008, and 10 in Hinckley. Traffic flow data for these cordon counts is collected during September. In addition, there are 4 DfT count sites in both Coalville and Hinckley, as shown in Table A6.3.

Table A6.3: Count sites used to derive traffic flow estimates in Leicestershire Case Study areas

Case study area	Site location	
Hinckley (control)	DfT	A5 (site 26136)
	DfT	A5 (site 56143)
	DfT	A447 (site 77300)
	DfT	A47 (site 99207)
	LCC	B4668 (site 20602)
	LCC	B578 (site 20604)
	LCC	B4666 (site 20605)
	LCC	A47 (site 20606)
	LCC	A47 (site 20608)
	LCC	B6105 (site 20611)
	LCC	B6103 (site 20612)
	LCC	B4667 (site 20613)
	LCC	B4109 (site 23910)
	LCC	B4669 (site 24070)
Coalville	DfT	A511 (site 56536)
	DfT	A511 (site 77287)
	DfT	A511 (site 77288)
	DfT	A511 (site 77289)
	LCC	Station Rd (site 20820)
	LCC	Grange Rd (site 20821)
	LCC	A447 (site 20822)
	LCC	A511 (site 20823)
	LCC	A511 (site 20825)
	LCC	A511 (site 20835)
	LCC	A447 (site 21615)

Greater Manchester produce annual estimates of 24-hour annual weekday motor traffic flows on the major road network[10], including in Hyde and Hattersley (Tameside), Rochdale and Wigan, but only one site is suitable for inclusion in this study (although data for that site ceased to be collected in 2013, so has been excluded from these analyses). In addition, there are 8 DfT count site locations

[10] 2013 data is available from http://www.gmtu.gov.uk/reports/transport2013.htm. The full summary of 2014 data has yet to be updated online, although some data is available here: http://www.gmtu.gov.uk/reports/transport2014.htm .

within the Hyde/Hattersely area, a further 8 within Rochdale town centre, and 11 sites in Wigan town centre (2 of which have ceased to be collected since 2013), as set out in Table A6.4.

Table A6.4: Count sites used to derive traffic flow estimates in Greater Manchester Case Study areas

Case study area	Site location	
Wigan (control)	DfT	A49 (site 8566)
	DfT	A49 (site 8567)
	DfT	A49 (site 8568)
	DfT	A49 (site 18551)*
	DfT	A573 (site 28696)
	DfT	A49 (site 28698)*
	DfT	A49 (site 38653)
	DfT	A49 (site 38654)
	DfT	A49 (site 48635)
	DfT	A49 (site 58256)
	DfT	A49 (site 58257)
	GM	A49 (site 1075)*
Hyde / Hattersley	DfT	A627 (site 28694)
	DfT	A560 (site 37332)
	DfT	A627 (site 57372)
	DfT	A57 (site 58255)
	DfT	A57 (site 60027)
	DfT	A57 (site 60028)
	DfT	A560 (site 77876)
	DfT	A560 (site 77877)
Rochdale	DfT	A58 (site 6575)
	DfT	A58 (site 16558)
	DfT	A680 (site 27469)
	DfT	A58 (site 27940)
	DfT	A640 (site 37491)
	DfT	A671 (site 38048)
	DfT	A6060 (site 47476)
	DfT	A58 (site 56600)

* Note: Data for DfT sites 18551 and 28698, and GMT site 1075 ceased to be collected in 2013, so these sites have been removed from subsequent analyses.

We have collated the most relevant count data, from both Department for Transport (46 sites) and Local Authorities (21 sites). These are given for our three areas as set out below.

Table A6.5: Mean annual average daily traffic[11] per study area in South Hampshire.

	No of sites DfT+LA	2008	2009	2010	2011	2012	2013	2014
Control (W. Fareham)	5+1	25711	25906	25502	25849	26076	26268	26763
Eastleigh	5+1	19408	19127	18623	18634	18621	18618	18968
Gosport	3+2	34440	34273	33555	33377	32787	31904	32574

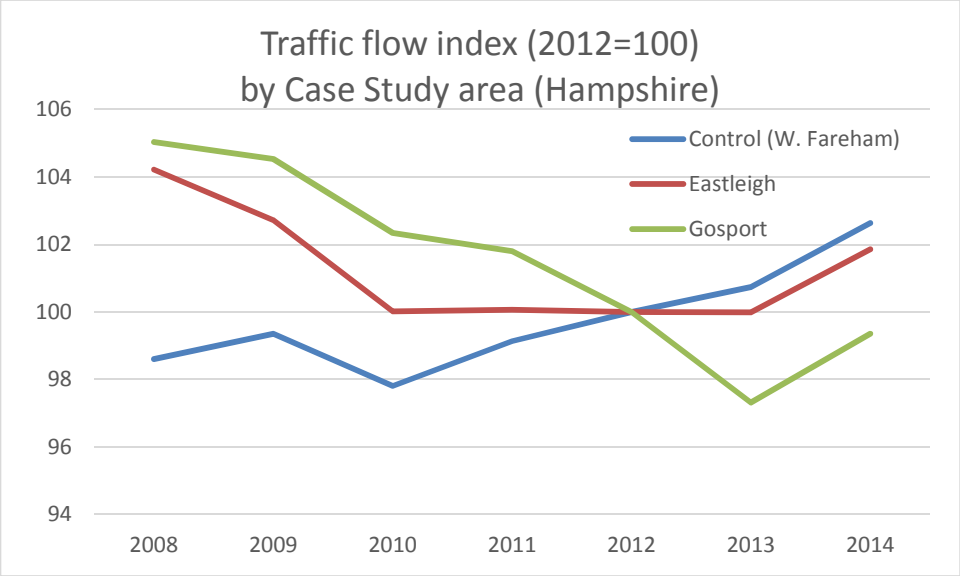


Figure A6.1: Traffic flow index per study area in South Hampshire

It can be seen from Table A6.5 and Figure A6.1 that between 2008 and 2013 traffic volumes in the two treatment areas had been decreasing but in the control area volumes had been increasing. However, traffic has increased across all the study areas in 2014: in the control area of Fareham by 1.9%, in the Eastleigh area by 1.9% and in the Gosport area by 2.0%.

[11] Traffic flow figures have been derived from combining DfT annual estimates (available from www.dft.gov.uk/traffic-counts) and Local Authority 24-hour counts at the sites listed in Tables A6.2 to A6.4

Table A6.6: Mean annual average daily traffic per study area in Leicestershire

	No of sites DfT+LA	2008	2009	2010	2011	2012	2013	2014
Control (Hinckley)	4+10	13429	13592	13503	13778	13852	13776	14363
Coalville	4+7	13778	13590	13426	13348	13295	13274	13580

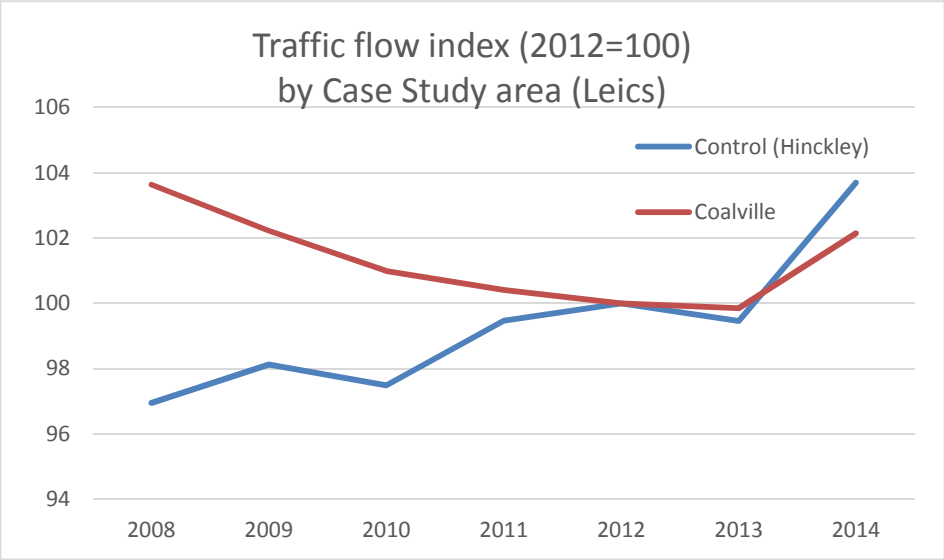


Figure A6.2: Traffic flow index per study area in Leicestershire

As can be seen from Table A6.6 and Figure A6.2, between 2008 and 2012 traffic volumes had been decreasing in the treatment area (Coalville) and increasing in the control area (Hinckley). Traffic was broadly stable in both areas in 2013, with increased volumes of traffic in 2014. The increase for the treatment area (Coalville) was 2.3%, that in the control area of 4.2%.

Table A6.7: Mean annual average daily traffic per study area in Greater Manchester

	No of sites DfT+LA	2008	2009	2010	2011	2012	2013	2014
Control (Wigan)	9+0	20073	19671	19273	19164	18490	18947	19323
Hyde	8+0	10092	9919	10037	9941	9828	9533	9822
Rochdale	8+0	19597	19851	19810	20469	20266	20206	20690

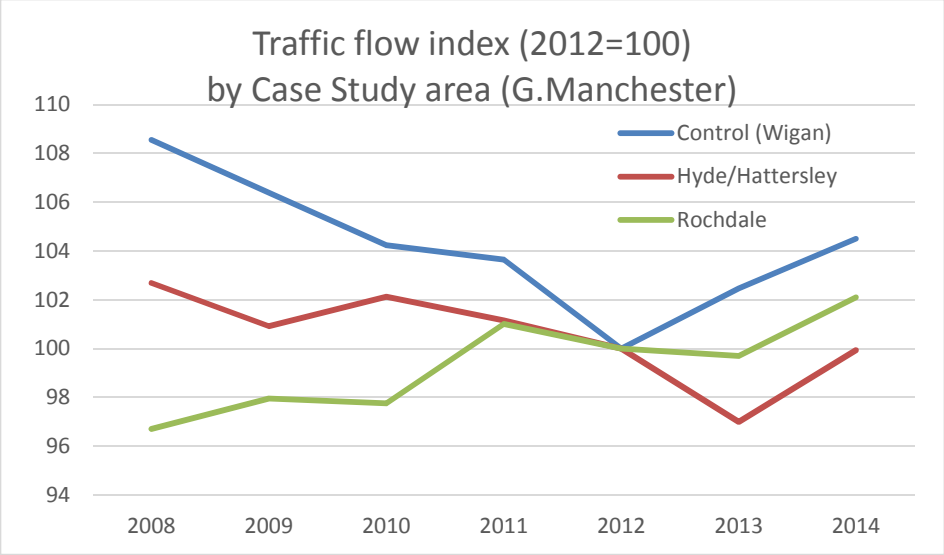


Figure A6.3: Traffic flow index per study area in Greater Manchester

Table A6.7 and Figure A6.3 show that up to 2013 there were mixed trends in Greater Manchester. In one of the treatment areas (Hyde) traffic had declined in four out of five years. In the other treatment area, Rochdale, traffic grew between 2008 and 2011 but reduced slightly in 2012 and 2013. For the control area (Wigan), traffic volumes declined up to 2012 but there has been some increase in the last two years (up by 4.5% since 2012). Traffic levels appear to have increased across all Greater Manchester study areas in 2013, with an increase of 2.9% in Hyde, and 2.4% in Rochdale.

From the above it is clear that traffic volumes have increased in all areas during 2014. An important issue is that not all of this traffic will be local traffic – some of it will be through traffic. For Leicestershire and South Hampshire, we have been able to measure the extent of through traffic by making use of outputs from the Leicester and Leicestershire Integrated Transport Model[12] (LLITM) and the South Hampshire SRTM (Sub Regional Transport Model) respectively. In Table A6.8 below, AM Peak Traffic is given for 2011 (for Leicestershire), 2010 (South Hampshire) and 2012 (Greater Manchester). We find that the percentage of through traffic varies from 0 in Gosport (which has a peninsular location) to 39% in Coalville (which has a central inland location).

[12] See: http://www.leics.gov.uk/llitm.htm

Table A6.8: Through and total traffic in the Case Study areas

	Through Traffic	Total Traffic	% of Through Traffic
Coalville	5,570	14,350	39
Eastleigh*	6,425	23,005	28
Gosport	0	9,841	0
Hinckley	2,279	16,684	14
Lock's Heath (W Fareham)*	4,262	18,263	23
Rochdale **	2,213	19,139	12
Tameside	3,492	12,426	28
Wigan	4,638	18,986	24

* Excluding through Motorway Traffic on the M3 and M27.

** Excludes traffic on M60, M62 and A627M.

The 24 hour traffic total for Eastleigh is 297,495, for Gosport is 137,694 and for Lock's Heath (West Fareham) is 220,687. This leads to grossing-up factors of 12.93, 13.99 and 12.08 respectively. In Greater Manchester, we have 269,185 for Rochdale, 174,566 for Tameside and 271,795 for Wigan. This suggests grossing-up factors of 14.06, 14.04 and 14.32 respectively.

In order to report on congestion across the area, a congestion index has been developed for Solent Transport, using data from a range of traffic count sources and Trafficmaster[13] historic journey time data. Table A6.9 shows average journey times per mile during the morning peak period, on weekdays during term time. The index has been calculated for the whole of South Hampshire, as well as the three corridors groups. The index is based on the former National Indicator for congestion (NI 167), giving the 'vehicle journey time per mile during the morning peak (0800-0900)'. Corridors 4 and 5 refer to the Chandler's Ford and Eastleigh corridors, both part of our Eastleigh treatment area. Corridor 7 refers to the Gosport treatment area, with NB being Northbound (the peak direction of travel in the morning) and SB being Southbound. It can be seen that, between 2011/12 and 2013/14, there were substantial increases in AM peak journey times for South Hampshire (around 10%) and for corridors 4/5 serving Eastleigh (around 15% - but in part related to road works at Junction 5 of the M27). By contrast, there was a 9% reduction in corridor 7 serving Gosport in the peak direction (Northbound), but a 2% increase in the counter-peak direction (Southbound). For the Gosport corridor we find counter-peak speeds are 48% higher than those in the peak direction. As would be expected these peak speeds are considerably below the all week speeds reported in Appendices 2 and 5. For example, the speed for Eastleigh implied by Table A6.9 is 12.8 miles per hour compared to 23.9 miles per hour in Table A5.4. Similarly, the average speed for Gosport implied by Table A6.9 is 16.5 miles per hour compared to 20.2 miles per hour in Table A5.4.

[13] Trafficmaster supplies local authorities with historical journey time data, calculated using anonymised data from around 50,000 probe vehicles equipped with global positioning system devices, which record speed and location information. Further information is available at www.trafficmaster.co.uk

Table A6.9: Congestion index – vehicle journey time (in minutes) per mile for the morning peak (0800-0900)

	2009/10	2010/11	2011/12	2012/13	2013/14
South Hampshire	3.56	3.48	3.44	3.52	3.70
Corridor 4/5	4.39	4.07	4.06	4.22	4.67
Corridor 7NB	4.34	4.46	4.97	4.76	4.50
Corridor 7SB	3.04	3.13	2.99	2.94	3.05

Data source: HCC, SCC, PCC, Trafficmaster, DfT

Leicestershire County Council also provide a measure of journey time reliability for Coalville and Hinckley[14]. Observed speeds in Coalville have been steadily declining since 2012, with a similar decrease for Hinckley in 2013; however, there was a slight increase in speeds in 2014.

Table A6.10: Average observed speeds (miles per hour) for LCC study areas

	2011	2012	2013	2014
Coalville	19.00	19.16	18.72	18.46
Hinckley	19.72	19.93	18.46	18.64

A6.2 Rail Usage

Monitoring rail usage gives an example of how non-road transport use has changed. As Coalville in Leicestershire is not rail served, our focus is only on South Hampshire and Greater Manchester.

The stations of interest in South Hampshire are given in Table A6.11, whilst usage of the stations in the Eastleigh area are given in Table A6.12 and usage of the stations in the control area of Lock's Heath (West Fareham) are given in Table A6.13.

[14] Leicester and Leicestershire Journey Time Reliability: Sept 2010 – August 2014 (Transport Data and Intelligence Team, Environment and Transport). Coalville speeds are measured at 5 locations, those in Hinckley at 6 locations.

Table A6.11: Stations in the rail usage assessment for Solent Transport case study areas

Case study area	Railway station
Eastleigh	Chandlers Ford
	Eastleigh
	Southampton Airport (Parkway)
	St Denys
	Swaythling
Gosport	None
Lock's Heath (West Fareham)	Bursledon
	Hamble
	Netley
	Swanwick

Table A6.12: Annual usage of stations in the Eastleigh area

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Chandlers Ford	236,102	218,640	225,622	241,310	238,502	244,338
Eastleigh	1,445,366	1,435,960	1,504,090	1,497,390	1,532,168	1,599,710
So'ton Airport	1,460,708	1,411,294	1,408,684	1,508,948	1,539,766	1,604,488
St. Denys	218,772	213,904	235,356	247,438	262,794	288,956
Swaythling	90,004	83,600	89,816	103,766	114,594	130,228
Total	3,450,952	3,363,398	3,463,568	3,598,852	3,687,824	3,867,720

Table A6.13: Annual usage of stations in the Lock's Heath (West Fareham) area

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Swanwick	517,922	510,472	581,456	618,574	631,824	677,520
Bursledon	54,776	54,894	60,264	59,300	59,614	65,206
Hamble	86,582	86,822	92,008	111,302	126,072	122,062
Netley	89,934	89,342	96,608	106,028	102,072	110,256
Total	749,214	741,530	830,336	895,204	919,582	975,044

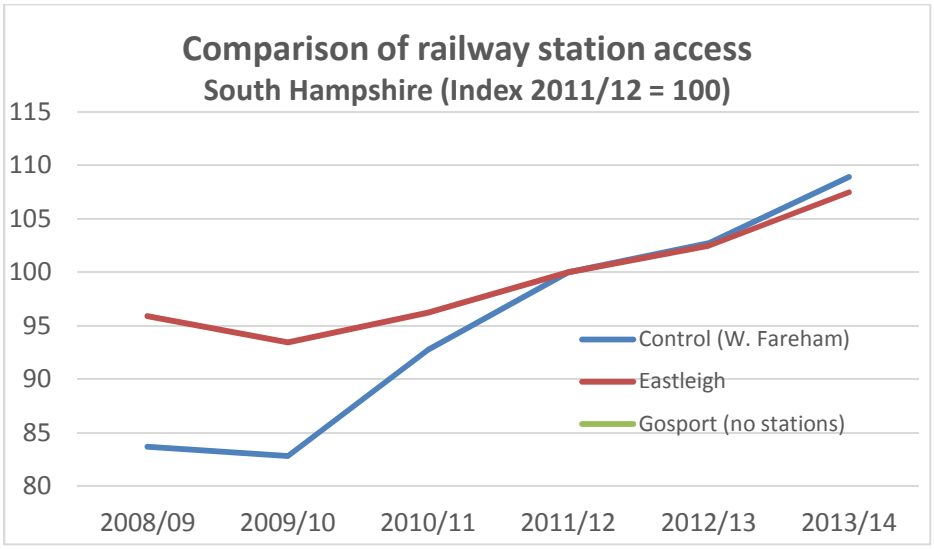


Figure A6.4: Trends in station usage in South Hampshire

From Figure A6.4, it can be seen that rail usage in the treatment and control areas exhibited similar growth over the most recent years, although the control area exhibited stronger growth in the period 2008/9 to 2011/12.

The stations we have examined for Greater Manchester are listed in Table A6.14. Usage data for the Hyde, Wigan and Rochdale areas are given by Tables A6.15 to A6.17 respectively.

Table A6.14: Stations in the rail usage assessment for Greater Manchester case study areas

Case study area	Railway station
Hyde/Hattersley	Flowery Field
	Godley
	Hattersley
	Hyde Central
	Hyde North
	Newton for Hyde
Wigan	Atherton
	Bryn
	Gathurst
	Hag Fold
	Hindley
	Ince
	Orrell
	Pemberton
	Wigan North Western
	Wigan Wallgate

Case Study Area	Rail Station
Rochdale	Castleton
	Littleborough
	Mills Hill
	Rochdale
	Smithy Bridge

Table A6.15: Annual rail usage in the Hyde area

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Flowery Field	163,038	168,334	191,072	208,524	197,450	212,498
Godley	62,660	62,072	69,778	70,726	69,814	76,662
Hattersley	44,360	42,572	46,422	48,928	55,000	56,228
Hyde Central	49,846	53,458	59,970	65,150	69,502	87,128
Hyde North	30,722	34,614	41,062	43,332	43,938	44,346
Newton for Hyde	165,178	159,832	168,330	181,004	186,504	190,808
Total	515,804	520,882	576,634	617,664	622,208	667,670

Table A6.16: Annual rail usage in the Wigan area

	2008/09	2009/10	2010/11	2011/12	2012/13	2012/13
Atherton	369,202	367,554	410,512	424,058	448,934	433,766
Bryn	112,896	128,994	150,960	177,166	172,428	165,120
Gathurst	71,732	73,388	82,306	91,120	92,622	92,464
Hag Fold	52,558	59,308	64,892	65,222	56,600	52,618
Hindley	209,976	233,576	276,182	324,918	365,912	340,780
Ince	14,910	14,872	19,176	21,606	22,200	22,300
Orrell	86,602	94,428	101,358	112,006	116,540	112,236
Pemberton	45,316	45,314	52,254	58,858	70,346	69,790
Wigan North	1,038,503	960,121	1,066,546	1,073,710	1,071,012	1,154,040
Wigan Wallgate	1,312,712	1,454,429	1,573,684	1,699,728	1,648,628	1,688,758
Total	3,314,407	3,431,984	3,797,870	4,048,392	4,065,222	4,131,872

Table A6.17: Annual rail usage in the Rochdale area

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Castleton	122,678	120,382	126,592	153,010	150,108	143,506
Littleborough	358,176	344,284	354,046	384,834	376,934	368,598
Mills Hill	228,836	256,506	283,096	341,382	326,962	302,726
Rochdale	971,588	1,001,526	1,061,152	1,107,430	1,118,236	1,059,282
Smithy Bridge	125,274	134,410	141,048	163,064	167,054	146,980
Total	1,806,552	1,857,108	1,965,934	2,149,720	2,139,294	2,021,092

From Figure A6.5 it can be seen that the recent trends in rail usage in the two treatment areas and the control area are remarkably similar until 2013/14, when divergent trends emerge, with reduced station usage of 5% in Rochdale stations, i.e. returning to 2010/11 levels, usage increasing by 7% in Hyde and Hattersley stations, and a slight increase of 2% in Wigan stations.

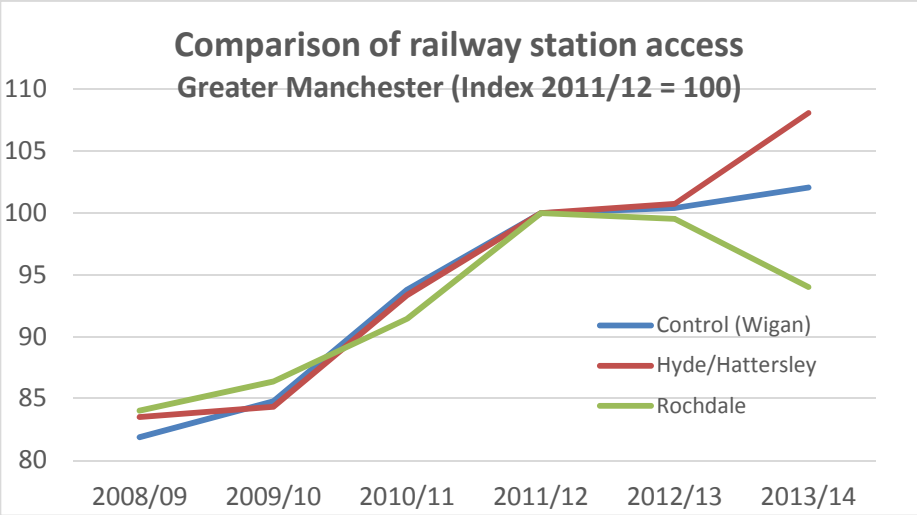


Figure A6.5: Trends in station usage in Greater Manchester

Disaggregate data on bus usage is not readily available but Local Authority level data indicate that between 2011/12 and 2013/14 there has been some modest growth in Greater Manchester (around 5%) and more substantive reductions in Leicestershire (around 9%), whilst usage in Hampshire is broadly stable. It is not possible to draw any conclusions regarding the effects of LSTF investment using this data as there are many factors that influence aggregate levels of rail and bus usage.

A6.3 Greater Manchester Metrolink patronage

Figure A6.6 shows the monthly patronage of the Metrolink service in Greater Manchester, showing the steady increase in passenger numbers as extra routes and services have been introduced.

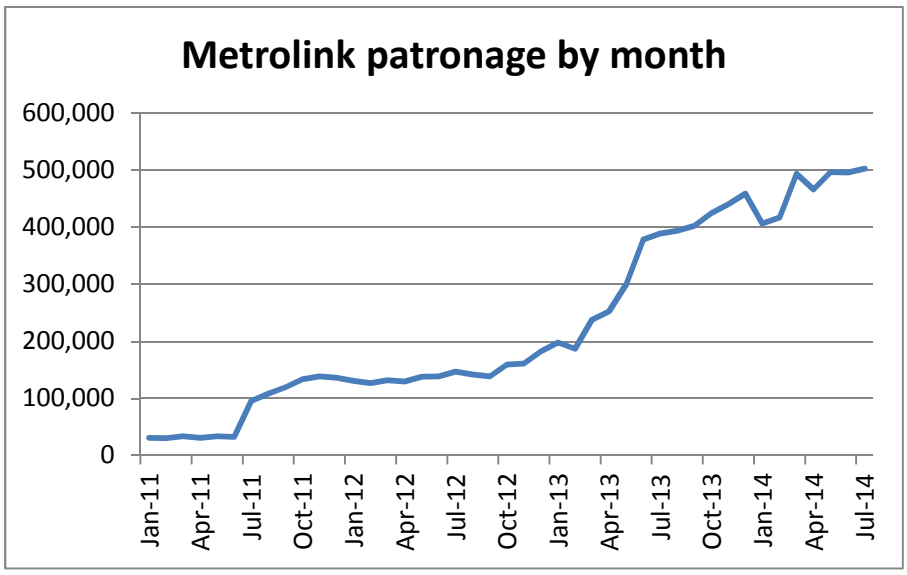


Figure A6.6: Trends in Metrolink usage in Greater Manchester

A6.4 Secondary Interventions

Alongside the primary physical interventions, there are a number of secondary interventions in the Case Study areas. These are largely focused on behavioural change measures at an individual, workplace and area level. This section principally describes the activities in the Case Study areas for Personalised Journey Planning (PJP), Workplace (and Area) Travel Planning and School Travel Planning. Data have been provided by consultant firms who carried out the various travel planning activities.

The anticipated locations for PJP in the case study areas are shown in Table A6.18

Table A6.18: List of anticipated areas for Personal Journey Planning

Personal Journey Planning	
Within LSTF Case Study area:	
Hampshire	Gosport (Hardway, Elson and Eclipse E2 corridor)
	Eastleigh (North and South)
Leicestershire	Central Coalville
Greater Manchester	Audenshaw (Tameside), Rochdale.

In South Hampshire, PJP took place in Gosport from May to August 2013, centred around the 'Eclipse' (Bus Rapid Transit) corridor. Of the 3,686 doors answered, 2,128 people participated: they were involved in a conversation about their travel choices, and then requested further information. A 60% participation rate is high compared with the other areas, due in part to the interest in sustainable travel already present in Gosport, with high rates of cycling activity and the development of 'Eclipse' providing a good 'hook' to engage the resident at the outset of a conversation. During the conversation, Travel Advisors use survey forms to gather details on travel behaviour and attitudes, as well as some personal details.

Participants were also encouraged to take part in a challenge, to trial the alternative modes they had discussed with the Travel Advisor. Of the 2,128 participants in Gosport, 165 agreed to either cycle to work, to the shops or as part of a family cycle ride, or to try bus taster tickets. Once the participant had provided feedback on the experience, they received their incentive gift. Cycling was most popular in Gosport (where levels of cycling activity are already high).

Results from the after survey (carried out in October 2013) suggest that the majority of respondents considered the PTP programme to be an effective means of encouraging people to consider a wider range of travel choices. Of those who took part in the challenge aspect of the programme, two-thirds reported that they had continued to use that sustainable mode. Results from a further follow-up survey in March 2014 indicate a reduction in solo car use in Gosport of 10% for commuting and leisure trips and 19% for shopping and personal business compared to before the intervention. It should be noted that these results are from a relatively small sample size (of 12 and 24 respondents respectively).

The greatest sustained modal shift has been from driving to walking. Overall the health benefits of walking and cycling were noted in the follow up survey as being the main reasons for respondents' long term modal shift. But the 'sticks' of higher motoring costs and increased public transport fares (to a lesser extent) were also important reasons.

PJP was carried out in Eastleigh in summer 2014. The contact rate was 50%: 2,030 of the 4,048 targeted households were contacted. Of these, there were 610 participant households, a 30% participation rate, which is around half as effective as the Gosport PJP. 133 of these respondents took part in the after survey carried out as part of the evaluation. While 59% of these respondents were aged 25-64, a significant proportion (40%) were aged 65 or over, reflecting the higher likelihood of elderly residents being at home during the survey period. There was also an over-representation of women respondents (67%).

Of these 83 after survey respondents who had used bus services within three months, 14% said they were not satisfied with local bus services; 64% however said they were satisfied. 84% of the 80 respondents who had travelled by train within three months of the after survey said they were satisfied with local rail services, while 9% said they were not satisfied. In terms of walking routes, 91% of the 115 respondents who had used local walking said they were satisfied, while 3% said they were not satisfied. 51 respondents had used local cycling routes within three months of the after survey, and 25% of these said they were not satisfied with the routes, while 43% said they were satisfied. Except for walking routes, these satisfaction levels do not compare favourably with the two other Hampshire localities which were identified for PJP work as part of this programme. Generally, residents of Andover and Farnborough (the two other localities) were more satisfied by local public transport and cycle route provision than Eastleigh residents; these towns were not included in the South Hampshire LSTF interventions, but may have had other behavioural change schemes in place during this time period.

As part of the PJP process, residents were offered information materials by the travel advisors. In Eastleigh, the most popular requests for such information were a 'My Journey – Getting around Eastleigh' information leaflet (requested by 47% of participants), a leaflet giving details of 'smarter driving' (requested by 33% of respondents), and bus and rail timetables. The 'getting around Eastleigh' leaflet and local bus and rail timetable information were the materials rated as the most effective in helping them to consider how they could travel in the local area.

Results of the after survey indicate a change in the trip modal share, whereby respondents had made an 8% shift away from car use as a single occupant towards car sharing (+5%), cycling (+2%) and bus usage (+2%), with walking slightly decreasing by 1%. One quarter of respondents said they thought they had changed travel behaviour within the three months prior to completion of the after survey. When asked why their behaviour had changed, 66% of the 32 respondents said they were cycling or walking more to keep fit, 47% said it was because it was more pleasant to walk or cycle, and 41% quoted costs savings as one of the reasons for change.

In Leicestershire, as part of the 'Choose How You Move' behaviour change project, the 2013 PJP work consisted of targeting 6,200 households in three particular central areas of Coalville in the vicinity of recently improved cycle networks, with a further 8,340 targeted households in summer 2014. The locations of the delivery areas are shown in Figure A6.7.

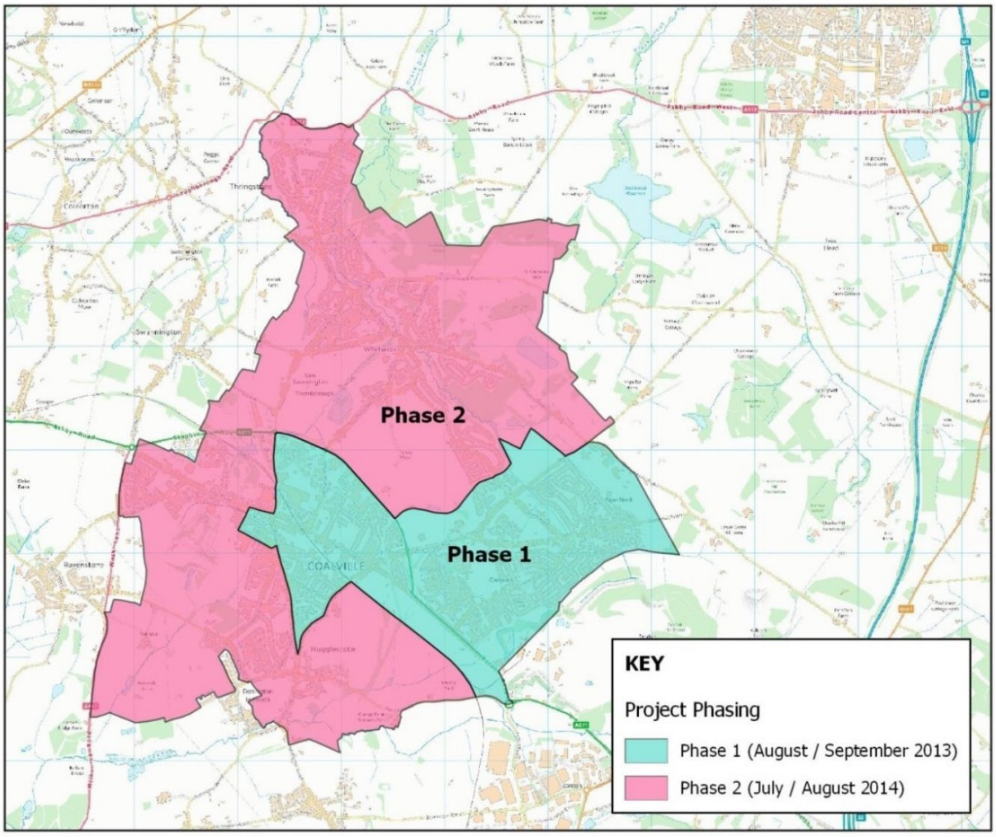


Figure A6.7: Coalville PJP delivery phases [from Taylor (2015)]

A total of 3,262 participants took part in the PTP programme. 26% of those contacted in 2013 actively participated, while the participation rate in 2014 was 21%. This slight drop is thought to have been due to a new 'digital by default' delivery method, where participants received a travel information pack through online delivery, rather than the more traditional paper copies.

489 participants took part in both before and after surveys in Coalville. As for Eastleigh, there were more female participants than male, with an under-representation of younger people (18-25) and an over-representation of older people (61 and over). Of the material offered, a short walk leaflet and bus map and guide were consistently the more frequently requested items, while details of car sharing and adult cycle courses were least requested. Bus timetabling and map information was deemed to be the most useful, along with the short walks leaflet and cycle maps.

In terms of the impact on travel behaviour, participants' single occupancy car use for work journeys decreased by 16% in Phase 1, and by 12% in Phase 2, with concomitant increases in car sharing (+12%, Phase 2), walking (+8%, Phase 1) and bus use (+5% Phase 1, +3% Phase 2), although the patterns of change for both Phases are slightly different (with less car sharing in Phase 1, and decreased walking in Phase 2). Car sharing and bus use also increased for shopping trips, generally replacing single occupancy car use and walking.

In all, 14% of participants stated that they had changed their travel behaviour since the project started, citing money savings and health benefits as the main reasons.

Parker et al. (2014) report that the 2013 PJP interventions in Coalville and Loughborough have resulted in annual vehicle km savings of 3.5 million and a reduction in carbon dioxide emissions of

475 tonnes, largely due to reduction in car mode share for trips to work by between 4% and 22%. Assuming that these reductions are in direct proportion to the number of PJP contacts, this implies savings in Coalville of 0.86 million vehicle kms and 117 tonnes of carbon dioxide in 2013, with an implied saving of 132 tonnes of carbon dioxide in 2014. It should be noted that this implies carbon dioxide emissions of around 136 tonnes per million vehicle kilometres. From Table A5.3 we note the total car/van carbon emissions from the 372 Coalville respondents is around 556 tonnes CO_2e. From Table A2.2b, we note the mean distance travelled as a car driver is 129 miles per week. This implies emissions of around 138 tonnes per million vehicle kilometres - comparable to the computations of Parker et al.

From Table A5.3, we estimate the mean annual emissions per person of car/van related carbon is 1.358 tonnes. Given that 3,262 individuals took part in the Coalville PTP then this suggests total emissions from this group of around 4,430 tonnes and hence a reduction in carbon emissions of the order of 7-8% was achieved.

In South Hampshire, each of the Local Authorities (LAs) provides some Workplace Travel Planning (WTP) activities, alongside Sustrans who also work in each of the LAs. Table A6.19 shows the larger employers that are currently involved in the LSTF Case Study area. Data from a core question set have been obtained form 246 respondents at five workplaces in Eastleigh and 464 respondents from 12 workplaces at Gosport, although 421 of these are from just two employers.

Table A6.19: Workplace Travel Planning activities within Solent Transport LSTF Case Study areas

Workplace Travel Planning	
Within LSTF Case Study area:	
Eastleigh	
Large organisations	Aviva
	B&Q
	GE Aviation
Public sector organisations	Hampshire Fire and Rescue
	Eastleigh Borough Council
Large SMEs (100-250 employees)	Marwell Zoo
	Eastleigh College
Other	Chandler's Ford Commuter Forum
Gosport	
Large SMEs (100-250 employees)	Gosport War Memorial Hospital
Other	Daedalus/Newgate Lane area

Businesses are offered a suite of activities, and can select those which are most helpful or likely to engender change in travel habits. These activities include smarter driver training, bicycle maintenance and cycle training classes, 'Bike Doctor' sessions, bus services to and from local transport interchanges, a multi-business car-sharing scheme, pledge and commuter challenge activities, as well as roadshow events on site. Staff surveys are undertaken as part of the WTP process, to determine travel habits and help decide which interventions might be most appropriate.

WTP in Eastleigh

Comparing Workplace Travel Plan surveys for Eastleigh, there appears to have been a decrease in use of private car between May 2014 and February 2015, largely shifted to walking to work, with slight increase in bus use, as shown in Table A6.20. Cycling activity remained the same between the two surveys. Note that the 2015 survey was completed by half as many respondents than the 2014 survey, indicating perhaps that there may be some selection bias in the second survey – those who had changed mode away from private car might be more willing to respond than those who did not.

Table A6.20: Main mode of travel to work by Eastleigh WTP respondents

Main mode of travel to work	2014 (n=242)	2015 (n=121)	Change
Bus (public transport)	2.9%	5.0%	2.1%
Car (drive alone)	62.8%	52.9%	-9.9%
Car share (as passenger)	7.0%	3.3%	-3.7%
Car share (driver)	5.0%	7.4%	2.4%
Cycle	1.7%	1.7%	0.0%
Motorcycle / scooter	1.2%	0.0%	-1.2%
Train	16.5%	17.4%	0.8%
Walk/jog	2.9%	12.4%	9.5%

Eastleigh drivers said that incentivisation (58% in 2014, 57% in 2015) and a guaranteed ride home (56% in 2014, 57% in 2015) might encourage them to car share. The least likely options selected were 'An event where you can meet other people looking to car share', 'A car share website that helps you to find a car share partner', 'Pool cars to enable ad-hoc business travel during the working day'.

The most common reason given for not walking to work was that respondents said they lived too far away to do so (71% in 2014, 72% in 2015), and that nothing would persuade them to walk (22% in 2014, 17% in 2015), although these response seem to indicate that in general there is a higher proportion of respondents who might be able to walk, as is shown in Table A6.20. Similarly for cycling, distance was most often selected as one of the reasons not to cycle (44% of 2014, and 49% of 2015 respondents said they lived to far from work to cycle). 34% (2014) and 27% (2015) said they

would not be persuaded to cycle. Safety concerns were issues that were likely to deter respondents from cycling, which reflects the findings from the primary cohort survey (see section A4.1 above).

When asked what might persuade them to use public transport, 'subsidised / cheaper fares' were cited as the most likely measure (by 46% of respondents in 2014, and 40% in 2015), while direct, frequent and reliable bus routes were selected by around 35% of respondents in 2014 and 39% in 2015. In 2014, 28% said that nothing could persuade them to use public transport; in 2015 this has risen slightly to 29%.

WTP in Gosport

In Gosport, the number of respondents dropped much more than Eastleigh, from 454 in 2014 to 131 in 2015. However, as can be seen in Table A6.21, the changes in mode share are not as great as for Eastleigh, with only a 4% reduction in private car as the main mode of travel to work, with a much greater decrease in cycling to work (from 14.5% of respondents to 8.1%). There were greater levels of bus use, car sharing and train journeys in 2015. Again, there may be some selection bias is these responses.

Table A6.21: Main mode of travel to work by Gosport WTP respondents

	2014 (n=454)	2015 (n=124)	Change
Bus (public transport)	2.9%	4.0%	1.2%
Car (drive alone)	65.9%	62.1%	-3.8%
Car share (as passenger)	1.5%	4.0%	2.5%
Car share (driver)	4.8%	8.1%	3.2%
Cycle	14.5%	8.1%	-6.5%
Motorcycle / scooter	4.6%	2.4%	-2.2%
Train	0.7%	6.5%	5.8%
Walk/jog	5.1%	4.8%	-0.2%

Gosport drivers in 2014 had said that incentivisation (45%) and a guaranteed ride home (38%) might encourage them to car share, although whether any such measures have been undertaken is not known; 54% of respondents in 2015 said incentivisation might encourage them to car share

The most common reason given for not walking to work was that respondents said they lived too far away to do so (52% in 2014, 61% in 2015), and that nothing would persuade them to walk (28% in 2014, 20% in 2015). Similarly for cycling, distance was most often selected as one of the reasons not to cycle (20% of 2014 respondents and 27% of 2015 respondents said they lived to far from work to cycle). 27% of respondents to both surveys said they would not be persuaded to cycle. Again, mirroring the Eastleigh results, safety concerns were issues that were likely to deter respondents from cycling, although a higher proportion of 2014 respondents (36%) cited this than 2015 respondents (26%), suggesting that cycle routes are now perceived to be safer.

For car drivers, the most cited reason for using the car was convenience, with 'time', and 'comfort' two of the other main reasons for driving. One third of car drivers said they had 'no alternative'.

The main reasons for both cycling and walking were 'health and fitness', with 77% of 2014 cyclists and 48% of 2014 walkers selecting this option. Cyclists in 2014 also said convenience was important, as were time and cost (there were only 5 respondents who cycled as their main mode in the 2015 survey). Walkers, too, thought that convenience, cost and lack of alternative options were factors behind their mode choice.

When asked what would persuade them to travel by public transport, 35% (in 2014) and 25% (in 2015) of the respondents who answered said that they would like more direct bus routes (i.e. passing closer to their place of work), that were frequent and reliable, with 31% (2014) and 37% (2015) asking for cheaper or subsidised fares. 45% in 2014 said that nothing would persuade them to use public transport, but this had decreased to 32% in 2015.

Of the measures which were selected when asked what would persuade them to walk to work, 'Safer walking routes' was most popular, with 14.2% (2014) and 13.9% (2015) of respondents choosing this option. 11.3% (2014) and 6.9% (2015) selected 'Improved surfacing, lighting and markings on pedestrian routes', and 'Improved showers and changing facilities at work' was selected by 11.0% (2014) and 11.9% (2015).

WTP in Leicestershire

One of the three themes of the LSTF work in Leicestershire is 'Getting to Work and Training', which aims to improve accessibility to jobs and training, but also includes facilitation of Business Travel Networks, which aim to engage employers in Coalville to help their staff travel more sustainably and 'Fit for Business' which challenges the workforce to participate in more active travel. Initial output milestones included delivering the workplace challenge to 80 workplaces and 800 participants, some of which will be in Coalville.

A range of businesses pledged to work with TfGM as part of their LSTF bid to provide travel information to their staff / visitors / customers, and engage in workplace travel planning. Evaluation of the effects of this engagements in Rochdale and Hyde are still to be reported.

School Travel Plan activities

Of the 242 eligible schools[15] in South Hampshire (excluding Portsmouth and Southampton), 51 (21%) currently participate in STPs. In December 2013, 26 of these were active, 17 were 'in progress', with the remaining 8 schools who had shown an interest yet to become involved. The 51 schools represent nearly 20,000 pupils, although the number of pupils actively engaged in LSTF School Travel Plan activities will vary depending on the particular activity.

Table A6.22 shows the schools in the case study areas of Eastleigh and Gosport that are engaged in School Travel Plan activities.

[15] Eastleigh College is included among the Workplace Travel Planning described above

Table A6.22: School Travel Plans in the South Hampshire Treatment Areas

District	School	Postcode	Pupils	Age group
Eastleigh	Fair Oak Infant School	SO50 7AN	419	Infant
	Fryern Infant School	SO53 2LN	179	Infant
	Fryern Junior School	SO53 2LN	161	Junior
	St Swithun Wells School	SO53 2JP	237	Primary
	Norwood Primary School	SO50 5JL	228	Primary
	The Crescent Primary School	SO50 9DH	403	Primary
	Hamble Primary School	SO31 4ND	309	Primary
	Berrywood Primary School	SO30 2TL	622	Primary
	Hamble Community Sports College	SO31 4NE	982	Secondary 11-16
Gosport	Haven Children's Centre	PO13 0UY	140	Nursery
	Brockhurst Infant School	PO12 4SR	178	Infant
	Lee-on-the-Solent Infant School	PO13 9DY	271	Infant
	Brune Park Community School	PO12 3BU	1508	Secondary 11-16

Since the School Travel Plan activities are not restricted to Solent Transport corridors, there are also some schools targeted in the control district of Locks Heath / West Fareham, although as shown by Table A6.23 the number of pupils is fewer than the case study areas.

Table A6.23: School Travel Plans in the South Hampshire Control Area

District	School	Postcode	Pupils	Age group
Fareham	Sarisbury Infant School	SO31 7BJ	270	Infant
	St John the Baptist C E Primary School	PO14 4NH	256	Primary
	St Francis Special School	PO14 3BN	87	Special School

Some mode use data are collected as part of the STP: data from the school census is used[16], coupled with data from a simple 'hands-up' survey, where children are asked to indicate which modes were used that day. Also, bike and scooter counts are carried out at schools involved in the Bike-It scheme[17], monitoring the number of bicycles and scooters parked on site during the day. Outcomes of the School Travel Plan activities in South Hampshire have not been provided for inclusion in this report.

43 schools in Coalville were contacted to engage in School Travel Plan activities, of which 9 have actively engaged in at least one element of the programme of measures available. There is an indication that these activities may have resulted in between 5% and 9% fewer car journeys to

[16] Census survey data on 'Usual mode of travel' was included in the school census until 2011/12, when the item was removed from the mandatory information to be collected. However, HCC continues to collect such data.
[17] Data is not yet provided on which schools are engaged in Bike-It activities.

schools actively engaged in Loughborough, Shepshed and Coalville. Of the 9 schools contacted in Hinckley, none had engaged in the programme for 2013/14. Data for areas in Greater Manchester have not been provided.

A6.5 Synthesis of Traffic estimates

From the above, we have seen that we have information on traffic volumes from both primary data (from the self-completion seven day travel diary) and from secondary data (principally from count sites but also some survey data used to populate traffic models). These data can be used to help understand the impact that the LSTF interventions may have had on traffic flows. However, it should be noted that any such effect on changing traffic levels will take place alongside changes due to other reasons, such as a change in demand for travel as a result of a stronger economy and other societal change, as well as non-LSTF interventions. Amongst such 'noise', isolating LSTF interventions as a factor of change may not be feasible at the small scale. Nevertheless, examples of how we might undertake such an assessment are given below.

It is important to differentiate between traffic that has potentially been affected by the interventions (e.g. with an origin or destination in the LSTF intervention area) and traffic that is unaffected (e.g. through traffic). The primary, individual level data from travel diaries described in Appendix 2 can be used to assess the extent of changes in local traffic due to changing behaviour of a small cohort of the population. This can then be compared with the secondary data outlined in section A6.1 above. Attribution would be based on the paired controls, whilst for physical interventions distance of origin and/or destination from the intervention would also be examined.

However, an estimation of changes to local traffic flows will depend on the source data. Some example calculations for the treatment area of Coalville will illustrate this point. Using travel diary data (from Table A2.2a), it is estimated that the mean travel distance as car driver is 132 miles per week and the mean distance travelled per round trip is 18 miles. This would suggest an average of 7.4 round trips by car driver per person per week or around 2.1 vehicle movements per day. (It should be noted that there are other ways the number of car driver trips can be estimated from our data). Given an adult population in the surveyed areas of around 36,000, this suggests traffic movements related to local residents in the Coalville area of over 76,000 vehicles per day.

Using traffic count data (from Table A6.6), we find that the average AADT count for the 11 sites in Coalville is 13,580 in 2014. This gives a daily traffic count of 149,380 vehicles per day. However, these count sites are not expected to give comprehensive coverage, some traffic will not be counted, whilst other traffic could be counted multiple times. Moreover, the count data will include travel by non-residents of the Coalville area and of commercial vehicles.

Comparing this with outputs from the regional transport model (from Table A6.8), we have modelled data for the 2010 morning peak hour in Coalville. Assuming an expansion factor of 13 in order to obtain daily totals, we estimate that total traffic in the Coalville area is 186,550 vehicle movements. If through traffic is excluded, this becomes 114,140 vehicle movements, although this will still include local travel by non-residents. From Table A6.6 we estimate that between 2010 and 2014 traffic in the Coalville area increased by just over 1%. We thus estimate there were 115,449 'local' vehicle movements in 2014. This can be contrasted with our estimate of around 76,000 vehicle movements made by local residents. For Coalville, we are therefore suggesting that around 66% of

local traffic may be attributed to local residents. This is similar to the estimated figure for 2013 of 67%.

Thus we have at least three broad measures of traffic volumes that we can utilise, although it is reassuring that in the case of Coalville all the estimates are of the same order of magnitude.

We noted in Section A6.3 that Parker et al. (2014) have estimated that PJPs in Coalville have led to a reduction in vehicle kms travelled of 0.86 million per annum. However, from Table A2.2a we estimate that the volume of car driver kms per annum by the Coalville adult population is of the order of 250 million kms. This is a reduction of only 0.3%. If from Table A2.2a we restrict our calculations to work journeys, we get an estimate of 86 million vehicle kms per annum. The reduction on this quantum is now closer to 1%. This illustrates the difficulties involved in measuring single intervention effects.

Similar calculations can be undertaken for Gosport. Consultant WSP reported that PJPs in Gosport in 2013 led to a 10% reduction in car driving trips for commuting and leisure trips and a 19% reduction for shopping and personal business trips (Winmill, 2015[18]). It should be noted that the impact of PJPs on education and employer's business trips is not stated or whether these trips have been abstracted or supressed. In similar work in Basingstoke, it was found the main effect was switching to walking, whilst in Andover, Eastleigh and Farnborough the main effect was switching to car passenger (ITP, 2015).

Our matched before and after sample for Gosport consists of 507 observations. These surveys indicated that at the before stage on average 38 miles were travelled per adult per week as a car driver for work, 23 miles for shopping and 27 miles for leisure purposes. This would suggest that the PJP has led to a weekly reduction in car driving per affected adult of 10.9 miles. It is estimated that the mean miles driven per adult per week in Gosport is around 125 miles per week, suggesting the PJP has led to an 8.7% reduction in car driving amongst affected adults, if the PJP results are relied on.

Given 2,128 participants to the PJPs in Gosport, this represents a reduction of 1.21 million vehicle miles per annum. These participants were sampled from 7,321 households. In 2011, the mean household size in Gosport was 2.36 and there were 35,000 households – meaning the PJPs covered only a little over one in five of the population.

Our estimates of overall traffic movements in Gosport are based on Sub Regional Traffic Model estimates of 137,694 vehicle movements per 24 hours in 2010. Given annual average daily traffic (AADT) counts of 33,555 in 2010 and 31,904 in 2013), we estimate the total daily vehicle movements in Gosport in 2013 as 130,919.

Our survey data for Gosport suggests an average of 13.2 single journeys as a car driver per adult per week – or 1.89 per day. Given an adult population of around 67,000, this accounts for around 127,000 car movements per day. If we assume, using the Sub-Regional Transport Model, the total car movements is 139,000, this is suggesting that almost 91% of vehicle movements in Gosport is

[18] Note this study was not commissioned or assured by the DfT

attributable to car driving by local residents. This indicates a very high degree of self-containment – reflecting Gosport's peninsular nature.

Our survey data also suggests a mean distance per car driver journey made by an adult in Gosport is 9.5 miles. This is relatively high and suggests that only a relatively small proportion of car driving trips will be amenable to switching to active travel. Overall total annual car driving travel of around 440 million miles is inferred. Given we estimated above that the PJP reduced vehicle traffic by 1.21 million miles, this illustrative calculation suggests a total traffic reduction of around 0.3%. AADT count data indicates a 2.7% reduction in the Gosport area between 2012 and 2013. These calculations suggest that only 11% of this reduction can be attributed to PJPs. The remainder could be attributed to a range of factors, such as other transport interventions internal to the LSTF (such as WTPs and School Travel Plans), transport interventions external to the LSTF (such as the launch of the Eclipse bus rapid transit system in 2012[19]), transport interventions external to the local policy domain (e.g. fuel prices) and non-transport factors such as changes in population, employment and income.

While the secondary data alone cannot be used to show the direct effects of LSTF in an attributable way, the findings suggest a relative reduction in traffic levels in the treatment areas compared to the control areas, which is consistent with the primary data analysis from Appendix 2 that also showed a relative reduction in car driving by respondents in the treatment areas compared to the control areas. Furthermore, based on secondary data, it is shown in this section that LSTF measures such as Personal Journey Plans may have resulted in modest changes at a population level and to changes in road traffic.

The approach we have adopted here could be characterised as a *between-methods* triangulation, comparing questionnaire data with count data (Denzin, 1970).

[19] In 2013, the Eclipse routes carried around 1.9 million passengers of which 14% were abstracted from car. However, this route (between Fareham and Gosport) is only around 7 miles long, suggesting that at most this intervention would abstract 1.9 million vehicle miles per annum – 0.4% of the Gosport total.

Appendix 7: Focus Groups Analysis

The aim of the focus groups is to learn more about the context of local travel behaviour and to evaluate the effects of implemented LSTF schemes. The focus groups were run at each intervention site during 2014 (Phase One) and 2015 (Phase Two), following longitudinal cohort surveys of travel behaviour in the intervention areas. The interviews with and discussion amongst the general public at the focus groups provide complementary data to help us better understand the quantitative travel survey data. Overall, 51 people attended the before focus groups and 41 attended the after focus groups, which represented a total of 92 participants (including those who repeated).

The 2014 focus groups found that Tameside (specifically Hyde) and Gosport are both impacted by long standing road congestion bottlenecks. Rochdale has been impacted by the arrival of Metrolink from 2013 onwards and the opening of a new Interchange. Coalville is impacted by the relative inaccessibility of the rail network, in marked contrast to Eastleigh which is characterised by good rail access. There were some common themes, such as congestion and parking difficulties, concerns over cycling safety and the cost and quality of public transport services. There appeared to be a low awareness of LSTF related initiatives (including smartcards) but higher awareness of other transport initiatives, including the extension of the Metrolink network in Rochdale and Tameside and the development of the Eclipse bus network in Gosport. Overall, the 2014 focus groups did not suggest a groundswell of support for radical change, although there were numerous suggestions for incremental improvements and there was a perceived need for interventions to be coordinated as part of a wider strategy to encourage sustainable travel, particularly when it comes to cycling.

The 2015 focus group meetings took place during July 2015; one year after the 2014 focus group meetings, and focused on (i) detailed consideration of how people travel (for example, mode of transport usually used) and whether there has been any change in behaviour over the last year due to LSTF measures, and (ii) changes in attitudes towards key topics which emerged from the thematic analysis of the 2014 focus groups transcripts and how these attitudes have affected behaviour.

Whereas the criterion for selection to the focus groups in 2014 was from a sample of 50 car-owners and non-car owners (100 at Coalville and Rochdale) randomly selected from the completed travel survey participants in each area, the criterion for the 2015 focus groups was that they had been invited to the previous focus groups (but not necessarily attended) and had completed both the 2013/14 and 2014/15 travel surveys. The number of invitations and responses for each area are shown in Table A7.1.

Table A7.1: Invitation and Response Numbers

Focus Group Sites		Invited		Responded Yes		Responded No	
		2014 attendees	New*	2014 attendees	New*	2014 Attendees	New*
South Hampshire	Eastleigh	10	45	5	2	2	1
	Gosport	10	48	6	1	1	2
Greater Manchester	Rochdale	9	80	5	6	0	2
	Tameside (Hyde)	9	33	4	2	1	0
Leicestershire	Coalville	13	71	5	6	2	0
	Sub Total	51	277	25	17	6	5
	Total	328		42		11	

Note: * means they were sent an invitation in 2014 and had completed both the 2013/14 and 2014/15 travel surveys but did not attend the 2014 focus groups.

In 2014, the venue locations in each area were selected on the basis of being as close to the town centre as possible, to be accessible by different modes of transport, and where exposure to some of the locally implemented LSTF schemes could be evidenced. It was therefore decided that the 2015 focus group meetings would be conducted in the same venues as the 2014 ones. The 2015 meetings were held on or near to the date of the 2014 focus group meetings, to avoid the school holidays, provide consistency, and allow us to compare the mode of transport participants used to attend the consecutive meetings. The number of participants who had confirmed and attended the 2015 focus group meetings is shown in Table A7.2.

Table A7.2: Confirmed, Attended and Booking Location

Focus Group Sites		Confirmed			Attended		Total Attended	Date
		From 2014	New	Total	From 2014	New		
South Hampshire	Eastleigh	5	2	7	5	4	9	13/07/2015
	Gosport	6	1	7	5	1	6	20/07/2015
Greater Manchester	Rochdale	5	6	11	6	6	12	15/07/2015
	Tameside (Hyde)	4	2	6	4	1	5	16/07/2015
Leicestershire	Coalville	5	6	11	3	6	9	09/07/2015
	Total	25	17	42	23	18	41	

At the beginning of the meeting our researchers distributed a copy of the participant information sheet, consent form and short demographic survey to each participant. Details of the Data Protection Act for data management and confidentiality were provided on the consent forms.

At the end of the meeting the participants were given £20 gift voucher as payment for their time and travel expenses incurred to attend the focus group meeting. Participants were asked to return a signed receipt acknowledging receipt of the voucher.

The whole session was audio-recorded and brief notes were drafted after each session. During the meetings, Dr Wong, Ms Ghali or Professor Preston acted as the moderator asking key questions.

Table A7.3 shows the question set that was used, following discussion with the DfT and the Expert Workshop.

Table A7.3: Question List for Phase Two (2015) Focus Groups

Question type	Question	Guideline to Moderator	Research Objective
Introductory question	How did you come here today?	Ask all participants to answer. Various answers expected but try to focus on the mode of transport, travel routes that participants took and the length of their journey. Once everyone has answered this ice breaking question focus on the main questions.	
Main questions	(1) To what extent have you changed your local travel behaviour over the last 12 months and why?	(1) The moderator should particularly focus on any changes in car use. Moderator should probe to determine the extent to which any change is due to factors related to the LSTF compared to more general changes in personal circumstances/lifestyle.	RO1
	(2) To what extent have your local travel choices improved over the last 12 months? For example, have there been changes in the availability of alternatives and/or information about those alternatives?	(2) Moderator should probe to see if choices affected by any of the following themes: • Integration issues: e.g. access, connections • Finance issues: e.g. ticketing, fares. • Service provision: capacity, community buses • Time: real time information	RO1 & 2

	(3) To what extent have local travel conditions changed over the last 12 months? For example, have there been changes in the quantity and/or quality of transport infrastructure and related facilities?	(3) Moderator should probe using the following thematic list: • Infrastructure management issues: e.g. road maintenance, traffic congestion, cycle paths, road layouts. • Environmental issues: e.g. pollution, sustainable travel options. • Safety and Security. • Time: journey time. • Planning issues: land use, infrastructure.	RO1 & 2
	(4) <Agency name> has been awarded funding from Department of Transport and developed a package that aims to promote travel choices in your area. This package includes < primary interventions in the site>. Have you been aware of any such schemes over the last 12 months? (**For those that have:**) Have you used these schemes or have they affected your travel behaviour? Did the schemes meet your expectations? **(For those that haven't:)** What ways might your awareness of these schemes have been increased? Would you use these measures going forward?	(4) Agency names and list of schemes differ by area. Details of the schemes are given in Table 4. If participants request, moderator explains the schemes. Primary schemes in each site: - Coalville: cycling infrastructure- Eastleigh: bus and rail station improvements and interchange - Gosport: bus priority - Hyde/Hattersley: Demand Responsive Transport/ station access - Rochdale: sustainable access to Metrolink/ rail - Each area also has had a number of other physical measures and softer measures such as workplace travel plans, personal journey planning etc. - see Table 9.	RO1 & 2
Concluding question	(5) Does anyone have anything else they would like to contribute to the discussion?		

Table A7.4: List of Case Study Interventions

Case Study	Primary Interventions/ Treatments	Secondary Interventions/ Treatments
Eastleigh	Interchange	Area Travel Plan (Valley Park); College Travel Plans; Station Travel Plans; Bus Priority; Smart Cards.
Gosport	Bus Priority	Area Travel Plan (HMS Daedalus); Cycle Links; Ferry Interchange; Personalised Journey Planning; Smart Cards.
Rochdale	Sustainable Access to Metrolink/Rail	Cycle Hub; Demand Responsive Transport; Personalised Travel Planning; Workplace Travel Plans; Smart Cards
Hyde/Hattersley	Demand Responsive Transport Station Access	Workplace Travel Plans; Smart Cards
Coalville	Cycling Infrastructure	Car Sharing; Personalised Travel Planning; School Travel Plan; Wheels to Work, Business Surveys.

A table seating plan was produced for each of the 5 Phase One (2014) and Phase Two (2015) focus groups (in Coalville, Eastleigh, Gosport, Hyde and Rochdale) replacing the name of the participant and allocating them with an ID code from 1 to 13 depending on the numbers of participants, as shown in Table A7.5.

Table A7.5: Focus Group ID Coding

Area	ID Code
Eastleigh Participants	E1-10
Gosport Participants	G1-10
Rochdale Participants	R1-12
Hyde Participants	H-1-9
Coalville Participants	C1-13

The transcripts from each of the 5 Phase One and Two focus groups were crossed referenced with the timeline data produced at each of the focus groups meetings, matching the conversation with the person ID. It must be noted however, that due to over speaking it was impossible to match the conversation to a particular person on various occasions.

The audio recordings from the focus groups were also transcribed, and this transcribed data has been subsequently analysed using a form of structured Computer Assisted Qualitative Data Analysis, similar to NVivo. Once an ID had been assigned to the transcript conversations, the focus group questions were marked and the transcripts read though to find a list of common draft themes. The draft themes were originally produced from the Hyde transcript, followed by the remaining transcripts being read and additional themes being added to the list. This work was informed by the thematic analysis approach advocated by Braun and Clarke (2006) and the data labelling approach of Fitzpatrick (2014). The draft theme list is as follows in Table A7.6.

Table A7.6 Draft Themes

Safety
Ticketing
Fares
Connections
Access
Maintenance
Capacity
Congestion
Pollution
Sustainable Transport
Real Time Information
Personal Journey Time

However, there were a few items that were difficult to classify and that required further thought. These included themes related to Disability, New Motorways, Planning, and Community buses, such as Link Line and Airport services.

These difficult to place items were discussed, along with the draft themes, at an internal meeting. They were subsequently either allocated to existing 'nodes', as some of the nodes incorporated more than one draft theme, or were allocated their own nodes. These nodes were then incorporated into parent and child nodes, to give the hierarchy, as shown in Table A7.7.

The majority of the suggested themes were discussed by focus group participants in terms of factors directly impacting on travel behaviour (and hence research question 1). This included much of the discussion concerning finance, integration and service. Other factors were discussed more in terms of background conditions and hence factors having an indirect impact on travel behaviour, including infrastructure and planning. The discussions relating to safety and security and concerning time were often personalised and were suggestive of who might be changing behaviour and why (research question 2). For example, concerns over personal security were a factor in the reluctance to use public transport for some groups, whilst the influence of time often depended on personal circumstances, including family commitments. The discussion on the environmental theme was often with reference to reductions in the emission of pollutants, including carbon dioxide (research question 3).

Table A7.7 Node Hierarchy

Parent Node	Child Node	High Level Description of the overall Themes
Safety and Security		Personal security and safety
Finance	Ticketing	The cost of ticketing by different modes and carriers
	Fares	The cost of tickets
Infrastructure Management	Congestion	Roads congested by various means: amount of traffic, roadworks, accidents, etc.
	Cycle Paths	Operation
	Maintenance	Road works, utility works, repairs
	Road Layout	Operation
Integration	Access	Access: parking, routes, assistance at bus, train and tram stations; cycle bays, lack of space on trains/trams for bikes; crossing design, disability, airport
	Connections	Bus, train, tram connections to each other. Integration
Environment	Pollution	Smog and gases/air quality
	Sustainable Travel	Cycling, walking, trams, trains. Electric vehicles.
Time	Real Time Information (RTI)	Real Time Information (trams, buses, trains)
	Journey Time	A person's timeline?
Planning	Land-Use	Design and planning of new housing
	Infrastructure	Design and planning of new roads, motorways, cycle paths
Service Issue	Capacity	Capacity on trains, trams, buses
	Community Buses	Community Buses

The nodes were allocated a colour, and the transcript text was colour coded to the node colour. The Parent and Child Nodes, along with example quotes, are shown in Table A7.8.

Table A7.8: Parent and Child Nodes and Examples.

Parent Node	Child Node	Example(s)
Safety and Security		*"my main problem is that I don't drive and I walk everywhere or use public transport .. I feel unsafe, even during the day at some places. I was stood at Flowery Field Train Station, on my own because it's not manned and I'll be like who's that when I hear a rustle in the bushes, and I'll be jumping. I feel so unsafe."*
Finance	Fares/Prices	*"I know a car park where it's £2 after 4 o'clock and £2 every day at the weekend".*
	Ticketing	*"And if you've got such big differences in pricing where you can have £12 or £13 a week for a bus pass, are you going to give £13 a week for a bus pass or pay £50 a week for a railway pass? And this, I think, we need to look at the disparity in costs of travel first because I just think how can people really afford that?"*

Infrastructure Management	Congestion	*"It's nothing like it used to be in Hyde, it used to be terrible until they built the M67, and really there's nowhere in Hyde that's… that congested"*
	Cycle Paths	*"There aren't many actual bike lanes, or they're only very short, aren't they?"*
	Maintenance	*"Yeah, at the moment there's major roadworks."*
	Road Layout	*"And that is another place where the lights always seem to be out of sync all the time."*
Integration	Access	*"Well, there's no parking at Flowery Field. There is, there's parking for about three cars, so if anybody drives there all they've got to do is… there's a bit of a layby, isn't there?"*
	Connections	*"The provision for cyclists in the borough is quite poor, I'd say."*
Environment	Pollution	*"You do notice the different times of year my front door, which is white, it blackens most quicker in summer I would say that, probably, in winter. Now, I only can put that down to warm water running it off it because it's raining more. So you can just see little deposits of stuff on it."*
	Sustainable Transport	*"… I think sustainable transport is good. I've changed my car so it's one of those that stops and starts now when you're not moving and stuff"*
Time	Journey Time	*"The reason why I drive to Oldham is because it would take me two buses and a train to do the journey that I do in 20 minutes in a car, so it's a no-brainer, that one."*
	RTI	*"At the bus station there's all these fancy screens telling you the next bus, but they're worse than useless because if the bus is 10.10 and it gets to 10.10… It just disappears"*
Planning		*"It could be as fundamental as planning permission, as well, that could be something that's incorporated. So if you've got a construction firm who wants to build a big estate then they might say, "Well, you need to put some money in to get schools," or whatever, but how much of that agreement of granting the planning permission relates to transport?"*
Service Issue	Capacity	*"Rush hour that is just mad. They'd have two carriages and it was jam-packed, you were just like that."*
	Community Buses	*"From the house and take you direct to wherever you want to go. It might be you want to go to Morrison's, it will take you there."*

On coding the Phrase Two focus groups (2015), it became apparent that additional nodes were required. These are shown in Table A7.9 and have the letter N in brackets. A further read through the Rochdale transcript prompted the need for a new child Node under the Parent Node of Time to be included, thus the Child Node of Convenience was added, see Table A7.9a (shown colour coded).

Table A7.9: Node Hierarchy 2015

Parent Node	Child Node	High Level Description of the overall Themes
Safety and Security	Personal Security	Personal security and safety
	Safety	
	Threat Perception (N)	
Finance	Ticketing	The cost of ticketing by different modes and carriers
	Fares	The cost of tickets
	Car Parking (N)	Car Parking Costs
Infrastructure	**Congestion**	**Roads congested by various means, amount of traffic, roadwork's, accidents, etc.**
	Cycle Paths	**Design and Signage**
	Maintenance	**Road works, utility works, repairs**
	Road Layout	**Design and Signage**
	Town/City Infrastructure (N)	**Shops/Layout**
Integration	Access	Access, parking, routes, personnel at bus, train and tram stations; cycle bays, lack of space on trains/trams for bikes; crossing design, disability, airport. Park and Ride
	Connections	Bus, train, tram connections to each other. Integration
	Publicity/Information (N)	
Environment	Pollution	Smog and gases/air quality
	Sustainable Travel	Cycling, walking, trams, trains, electric vehicles
Time	Real Time Information (RTI)	Real Time Information (trams, buses, trains) at base or via mobile/wifi
	Journey Time	A person's timeline?
Planning	Planning	Design and planning of new towns, roads, motorways, cycle paths, land use
Service Issue	Capacity	Capacity on trains, trams, buses
	Community Buses	Community Buses
	Shared Services (N)	Work Place Travel Schemes/Plans, School Travel Schemes/Plans, Lift Sharing

N = New Node

Car parking also emerged as an issue, particularly in Greater Manchester where there had been reductions in charges in both Rochdale and Tameside. This discussion was often linked to debates concerning the vitality of town centre facilities as all of the treatment areas lie in the shadow of much larger city centres (Leicester, Manchester, Portsmouth, and Southampton). In Coalville, redevelopment in the town centre was causing major traffic disruption. Other new sub-themes related to publicity and information, particularly with regards to LSTF measures, with this reflecting a more mature appreciation of issues related to the LSTF. There was also greater awareness (at least relative to the 2014 focus groups) of shared services, such as lift sharing and taxi sharing schemes, which were also identified as a new sub-theme - see Table A7.9a.

Table A7.9a: Node Hierarchy 2015

Parent Node	Child Node	High Level Description of the overall Themes
Safety and Security	Personal Security	Personal security and safety
	Safety	
	Threat Perception (N)	
Finance	Ticketing	The cost of ticketing by different modes and carriers
	Fares	The cost of tickets
	Car Parking (N)	Car Parking Costs
Infrastructure	Congestion	Roads congested by various means, amount of traffic, roadwork's, accidents, etc.
	Cycle Paths	Design and Signage
	Maintenance	Road works, utility works, repairs
	Road Layout	Design and Signage
	Town/City Infrastructure (N)	Shops/Layout/Amenities (N)
Integration	Access	Access, parking, routes, personnel at bus, train and tram stations; cycle bays, lack of space on trains/trams for bikes; crossing design, disability, airport. Park and ride, ferry (N)
	Connections	Bus, train, tram, ferry (N), connections to each other. Integration
	Publicity/Information (N)	
Environment	Pollution	Smog and gases/air quality
	Sustainable Travel	Cycling, walking, trams, trains, Electric vehicles
Time	Real Time Information (RTI)	Real Time Information (trams, buses, trains) at base or via mobile/wifi
	Journey Time	A person's timeline, Paper timetables (N)
	Convenience (N)	Personal Circumstances
Planning	Planning	Design and planning of new towns, roads, motorways, cycle paths, land use
Service Issue	Capacity	Capacity on trains, trams, buses
	Community Buses	Community Buses
	Shared Services (N)	Work Place Travel Schemes/Plans, School Travel Schemes/Plans, Lift Sharing

N = New Node (or Description)

The 2015 focus group transcripts were then data cleaned by checking place, train, tram, bus, school and parking area names, listening and replacing the inaudible text. The five transcripts' coding was checked and ID's added against the correct respondent's dialogue.

The ice-breaker first question for the 2014 and 2015 focus group meetings was used to determine the mode of transport used to arrive at the meetings. Table A7.10 shows the breakdown of arrival mode for the 2014 focus groups. Despite attempts to ensure that we had broadly equal

representation between car-owners and non-car owners, it can be seen that around two-thirds of participants arrived by car.

Table A7.10: 2014 Mode of Travel to Arrive at the Focus Group

	Car	Public Transport	Active Travel
Eastleigh	8	1	1
Gosport	5	2	3
Rochdale	7	1	1
Hyde	3	2	4
Coalville	10	2	1
TOTAL	33	8	10

The details of the 2015 arrival mode of transport are shown in Table A7.11. Although the criteria for 2014 was an equal representation of car-owners and non-car owners, the criterion for the 2015 focus groups was that they had been invited to the previous focus groups (but not necessarily attended) and had completed both the 2013/14 and 2014/15 travel surveys. Thus, along with the difference of numbers attending each event (a reduction from 51 to 41 attendees) and with a mixture of 2014 and new attendees attending the focus group meetings (including one person using the Ring and Ride), no direct comparisons year-on-year was possible. However, as found in Phase One (2014), the majority of people used the car.

Table A7.11: 2015 Mode of Travel to Arrive at the Focus Group

	Car		Public Transport	Active Travel	Other
	Driver	Passenger			
Eastleigh	6	2 (same car)		1	
Gosport	4		1	1	
Rochdale*	6	2	1	2	
Hyde	1	1	1	1	1 Ring & Ride
Coalville	7	1	1		
TOTAL	24	6	4	5	1

* Includes one couple who came together and were not double-counted

Detailed thematic analyses of the focus group transcripts were undertaken in line with the earlier study. The initial focus was on the awareness of the LSTF schemes and the extent to which they have impacted on behaviour and are shown in Table A7.12.

Table A7.12: Focus Group Awareness of Specific LSTF Measures

	Physical (Primary) Measures	Softer (Secondary) Measures	Total Count per Focus Group Member
Rochdale	5	4	0.75
Tameside	3	1	0.80
Coalville	2	2	0.40
Eastleigh	4	0	0.33
Gosport	1	3	0.67

From Table A7.12 it can be seen that awareness of the LSTF interventions amongst the 2015 focus group participants were still generally low but slightly higher for the physical measures implemented over the last year. It appeared that the higher visibility of physical measures, and conversely the lower visibility of softer measures, impacted on awareness. There were some 15 counts of awareness of physical measures, which relate to demand responsive transport (7), cycling (4) and station improvements (4). There was lower awareness of smarter choice measures (10) such as Workplace Travel Plans (3), School Travel Plans (4), Smart Cards (2) and Personalised Journey Planning (1). The higher awareness count in Greater Manchester might relate to the marketing activity of Transport for Greater Manchester.

Table A7.13: Focus Group Behavioural Change Count

	Car		Public Transport		Active Travel		Sustainable Travel		Net
	More	Less	More	Less	More	Less	More	Less	
Rochdale	2	2	3	1	3		8	3	+5
Tameside	2	1	3				5	1	+4
Coalville	2	1	2		1	1	5	2	+3
Eastleigh	2		2				4		+4
Gosport		1		1				2	-2
TOTAL	8	5	10	2	4	1	22	8	+14

Table A7.13 indicates that there may be some behavioural change over the last year for all the focus groups; with much of this being sustainable travel, which involves using car less and/or using active travel and public transport more. However, most of these changes are due to changing personal circumstances, such as changing work, moving home, retiring or personal injury.

Participants in the focus groups were also asked to fill in a short questionnaire. The responses to the questions on awareness and behaviour are shown in Tables A7.14 and A7.15. Table A7.14 indicates that only a little over 50% of participants professed any awareness of LSTF measures in their local area over the last year, and as a result, Table A7.15 indicates that only a little over 20% of respondents had changed their travel behaviour in any way over the last year as a result of the LSTF, a figure that reflects the awareness analysis of Table A7.13, and is broadly reflective of the results from the wider primary survey. This is despite some of the 2015 focus group participants having previously taken part in the 2014 focus groups. It should be noted that three participants did not answer the awareness question and five participants did not answer the behavioural change question.

Table A7.14: Focus Group Awareness of LSTF Measures

	Not Aware at All	Partly Aware	Fully Aware but Not Directly Affected	Fully Aware and Directly Affected
Rochdale	4	3	2	2
Tameside	4	1		
Coalville	4	2	1	2
Eastleigh	3	3	1	
Gosport	3	3		
TOTAL	18 (47%)	12 (32%)	4 (11%)	4 (11%)

Table A7.15: Focus Group Travel Behavioural Change as a Result of LSTF

	Didn't Change	Changed a little	Change a lot
Rochdale	8	1	2
Tameside	4	1	
Coalville	7	1	1
Eastleigh	5	1	
Gosport	4	1	
TOTAL	28 (78%)	5 (14%)	3 (8%)

In the following Tables, the transcripts of the after focus groups have been examined in detail and frequency counts of the themes are given. There are 25 tables in all, with five for each of the five treatment areas. The transcribed/cleaned data relating to the main questions 1 to 5 was transferred into an excel format, in which further sorting was carried out, this involved the following:

- All dialogue was checked that it was positioned in separate rows;
- Columns were added for the question number, the question and for any prompts, following up questioning and/or summation of the dialogue;
- All dialogue was coded to the person speaking using format of ID, Gender, Age, Working or Non-Working Age and Time code;
- General information or agreements by focus group attendees was logged on separate rows (along with recording ID etc.);
- If the dialogue text by one participant, transcended different themes (parent/child node) this was separated onto different rows; and
- The dialogue was re-checked to ascertain, parent and child nodes were recorded correctly.

Question 1 (Tables A7.16, A7.21, 7.26, 7.31 and 7.36) examined the reasons for changes in travel behaviour. In all five areas the dominant theme relates to integration, in particular to issues concerning connections and access. This was often related to deteriorations in the quality of the public transport network specifically cutbacks in tendered services but there were instances of where improvements to public transport services or active travel networks had led to shifts to more sustainable travel:

..it's all changed now, I know I have got my car, but I use the local transport (bus service) as much as I can. (Male, Non-Working Age, Coalville).

There was relatively little discussion of trip suppression but when it was mentioned it was associated with increasing congestion and petrol prices:

I drive probably one day less a week now and I put £10 to £15 a week more fuel in the car and I drive less purely because of the traffic. (Female, Working Age, Rochdale)

Question 2 (Tables A7.17, A7.22, 7.27, 7.32 and 7.37) focussed on improvements to local travel choices. The dominant discourse remained related to integration, being the leading theme in three of the five areas, with improved access and connections being highlighted in Coalville and Tameside (especially with respect to heavy rail) and improved information in Gosport (especially concerning local buses and smart cards). In Eastleigh and Rochdale the related theme of time dominated, with particular emphasis on real time information systems associated with heavy and light rail, as well as

buses. Most of these improvements could be related to LSTF initiatives, although some initiatives pre-dated the LSTF (such as the real-time information provision associated with light rail in Rochdale) or were associated with related funding streams such as real-time information in Eastleigh associated with the Better Bus Area Fund.

Question 3 (Tables A7.18, A7.23, 7.28, 7.33 and 7.38) examined changes in local travel conditions. In four out of the five areas, the dominant theme related to infrastructure. In Gosport, the discussion particularly focussed on road layout changes, whilst in Eastleigh and Tameside the focus was more on congestion, and in Rochdale the focus was on road maintenance. In Coalville, the dominant theme was related to planning, which in turn related to recent housing and industrial developments which were believed to be putting pressure on the local road network.

Question 4 (Tables A7.19, A7.24, 7.29, 7.34 and 7.39) examined awareness of the Local Sustainable Transport Fund, with integration and service being the dominant themes. In both Tameside and Gosport, integration was the leading theme, primarily associated with information and publicity, although in Gosport, infrastructure was an equally important theme, associated with continuing changes made to accommodate the Eclipse bus rapid transit system. In Coalville and Eastleigh, the discussion focussed more on service issues. In Coalville, this related to shared services related to school travel plans and workplace travel planning such as liftsharing and works buses. By contrast, in Eastleigh the discussion was much more focussed on community buses – this involved consideration of demand responsive transport (dial a ride and taxi buses) as well as the more conventional bus network. In Rochdale, finance was the dominant issue, related particularly to public transport ticketing. However, overall there was low awareness of the Local Sustainable Transport Fund and the extent to which intended measures had been implemented. For example:

Has this package[20] been implemented or is it supposed to be implemented because I'm not aware of it but I would be very interested to know what it means. (Male, Non-Working Age, Eastleigh).

Moreover, it was sometimes expressed that there was an overreliance on the internet for information provision:

I think a lot of things are, basically, it's on line and things(are) on the internet if people are willing to access the internet and probably find out a lot more. (Male, Working Age, Tameside)

It was also felt that electronic information could be confusing:

I went online to look at what time the last tram was back home from Manchester and I think I'm quite savvy on things like that and I had to read it about four time and when I got on the tram, I got it back off my phone and gave it to my nephew and went: "What does that mean?" (Female, Working Age, Rochdale)

There was some discussion about the lack of publicity in the local media – but this was cast in terms of changes to the nature of local media itself:

[20] This LSTF package involved improvements to the pedestrian links between Eastleigh's train and bus stations and cycling links between the train station and Bishopstoke and Leigh Roads which were still on-going at the time of the focus group. Other elements of the package such as College, Personalised and Work Place Travel Plans and feeder bus services (e.g. between Southampton Airport Parkway and Chandler's Ford) had been completed.

.. the local newspaper has gone really wide now. So there is nothing very local in it. So you wouldn't know if anything was happening, you would be hard pressed to know about it really. (Female, Working Age, Tameside)

Question 5 (Tables A7.20, A7.25, 7.30, 7.35 and 7.40) examined other issues. As might be expected, this had the most diverse response in terms of themes. Finance was the dominant theme, but this was due to extended discussion of car parking in Gosport, although there was also a discourse on this topic in Rochdale. In Coalville, Rochdale and Tameside, integration returned as the dominant theme. In Coalville, this related to aspirations to use the freight rail line that goes through the area for passenger traffic, as well as better joining up of cycling infrastructure improvements schemes. Re-instatement of rail was also an issue in Gosport, although here the track has been lifted and the right of way is currently used by buses. In Tameside, the discussion related to the lack of connections between Hyde bus station and nearby rail stations (Hyde Central, Hyde North, Godley for Hyde) whilst in Rochdale the key issue was access, including parking at heavy and light rail stations and issues of overcrowding and the poor condition of the rolling stock on heavy rail, as highlighted in previous sections. In Eastleigh, the discussion focussed on infrastructure and particularly road layouts in the town centre.

Overall, neither the 2014 nor the 2015 focus groups indicated a groundswell of support for radical change in travel behaviour or local transport policy, although there were numerous suggestions for incremental improvements. Although we have not adopted psychological, sociological or other conceptual models to understand behavioural changes in this project, if we were to use the language of the trans-theoretical model of behavioural change, we would suggest that most of the participants to our focus groups were at the 'pre-contemplation' stage, i.e. they are not yet aware of a major need for change. Only around one in five of those involved in the 2015 focus groups were fully aware of the LSTF measures, with a similar number having undergone some behavioural change, which again endorses the findings from the primary surveys, and demonstrates the scale of the challenge for delivering wider population changes towards sustainable transport.

Table A7.16: Question 1 Frequency Counts for Coalville: To what extent have you changed your local travel behaviour over the last 12 months and why?

Parent Node	Frequency	Child Node	Frequency
Safety and Security	6	Personal Security	0
		Safety	1
		Threat Perception	5
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**1**	**Congestion**	0
		Cycle Paths	1
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	9	Access	7
		Connections	2
		Publicity/Information	0
Environment	5	Pollution	0
		Sustainable Travel	5
Time	2	RTI	0
		Journey Time	0
		Convenience	2
Planning	1	Planning	1
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.17: Question 2 Frequency Counts for Coalville: To what extent have your local travel choices improved over the last 12 months?

Parent Node	Frequency	Child Node	Frequency
Safety and Security	5	Personal Security	0
		Safety	5
		Threat Perception	0
Finance	5	Ticketing	3
		Fares	0
		Car Parking	2
Infrastructure	**3**	**Congestion**	0
		Cycle Paths	3
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	40	Access	26
		Connections	14
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	4	RTI	0
		Journey Time	4
		Convenience	0
Planning	9	Planning	9
Service Issue	5	Capacity	2
		Community Buses	0
		Shared Services	3

Table A7.18: Question 3 Frequency Counts for Coalville: Changes in local travel conditions

Parent Node	Frequency	Child Node	Frequency
Safety and Security	1	Personal Security	0
		Safety	1
		Threat Perception	0
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**10**	**Congestion**	8
		Cycle Paths	0
		Maintenance	1
		Road Layout	1
		Town/City Infrastructure	0
Integration	0	Access	0
		Connections	0
		Publicity/Information	0
Environment	6	Pollution	6
		Sustainable Travel	0
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	12	Planning	12
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.19: Question 4 Frequency Counts for Coalville: Awareness of LSTF

Parent Node	Frequency	Child Node	Frequency
Safety and Security	9	Personal Security	0
		Safety	8
		Threat Perception	1
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**1**	**Congestion**	0
		Cycle Paths	1
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	4	Access	3
		Connections	1
		Publicity/Information	0
Environment	6	Pollution	1
		Sustainable Travel	5
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	16	Capacity	0
		Community Buses	0
		Shared Services	16

Table A7.20: Question 5 Frequency Counts for Coalville – Additional Issues

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**3**	**Congestion**	0
		Cycle Paths	3
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	12	Access	12
		Connections	0
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	1	RTI	1
		Journey Time	0
		Convenience	0
Planning	11	Planning	11
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.21: Question 1 Frequency Counts for Eastleigh

Parent Node	Frequency	Child Node	Frequency
Safety and Security	2	Personal Security	0
		Safety	1
		Threat Perception	1
Finance	1	Ticketing	0
		Fares	1
		Car Parking	0
Infrastructure	**2**	**Congestion**	2
		Cycle Paths	0
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	17	Access	15
		Connections	2
		Publicity/Information	0
Environment	2	Pollution	0
		Sustainable Travel	2
Time	4	RTI	0
		Journey Time	0
		Convenience	4
Planning	1	Planning	1
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.22: Question 2 Frequency Counts for Eastleigh

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	1	Ticketing	1
		Fares	0
		Car Parking	0
Infrastructure	**4**	**Congestion**	0
		Cycle Paths	4
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	3	Access	2
		Connections	1
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	15	RTI	14
		Journey Time	0
		Convenience	1
Planning	0	Planning	0
Service Issue	1	Capacity	0
		Community Buses	0
		Shared Services	1

Table A7.23: Question 3 Frequency Counts for Eastleigh

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**32**	**Congestion**	19
		Cycle Paths	0
		Maintenance	2
		Road Layout	6
		Town/City Infrastructure	5
Integration	3	Access	2
		Connections	1
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	24	RTI	6
		Journey Time	17
		Convenience	1
Planning	17	Planning	17
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.24: Question 4 Frequency Counts for Eastleigh

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	12	Ticketing	6
		Fares	6
		Car Parking	0
Infrastructure	**13**	**Congestion**	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	3
		Town/City Infrastructure	10
Integration	46	Access	19
		Connections	1
		Publicity/Information	26
Environment	0	Pollution	0
		Sustainable Travel	0
Time	6	RTI	4
		Journey Time	1
		Convenience	1
Planning	0	Planning	0
Service Issue	61	Capacity	0
		Community Buses	61
		Shared Services	0

Table A7.25: Question 5 Frequency Counts for Eastleigh

Parent Node	Frequency	Child Node	Frequency
Safety and Security	7	Personal Security	0
		Safety	7
		Threat Perception	0
Finance	25	Ticketing	1
		Fares	24
		Car Parking	0
Infrastructure	**28**	**Congestion**	3
		Cycle Paths	0
		Maintenance	0
		Road Layout	25
		Town/City Infrastructure	0
Integration	5	Access	5
		Connections	0
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	4	RTI	1
		Journey Time	1
		Convenience	2
Planning	0	Planning	0
Service Issue	3	Capacity	0
		Community Buses	0
		Shared Services	3

Table A7.26: Question 1 Frequency Counts for Gosport

Parent Node	Frequency	Child Node	Frequency
Safety and Security	22	Personal Security	0
		Safety	10
		Threat Perception	12
Finance	14	Ticketing	2
		Fares	12
		Car Parking	0
Infrastructure	**19**	**Congestion**	13
		Cycle Paths	4
		Maintenance	0
		Road Layout	1
		Town/City Infrastructure	1
Integration	62	Access	42
		Connections	14
		Publicity/Information	6
Environment	21	Pollution	1
		Sustainable Travel	20
Time	39	RTI	9
		Journey Time	5
		Convenience	25
Planning	0	Planning	0
Service Issue	1	Capacity	1
		Community Buses	0
		Shared Services	0

Table A7.27: Question 2 Frequency Counts for Gosport

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	4	Ticketing	4
		Fares	0
		Car Parking	0
Infrastructure	**17**	**Congestion**	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	16
		Town/City Infrastructure	1
Integration	25	Access	9
		Connections	2
		Publicity/Information	14
Environment	0	Pollution	0
		Sustainable Travel	0
Time	3	RTI	3
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.28: Question 3 Frequency Counts for Gosport

Parent Node	Frequency	Child Node	Frequency
Safety and Security	20	Personal Security	0
		Safety	22
		Threat Perception	0
Finance	4	Ticketing	4
		Fares	0
		Car Parking	0
Infrastructure	**126**	**Congestion**	15
		Cycle Paths	6
		Maintenance	1
		Road Layout	95
		Town/City Infrastructure	9
Integration	28	Access	13
		Connections	2
		Publicity/Information	13
Environment	17	Pollution	10
		Sustainable Travel	0
Time	10	RTI	3
		Journey Time	5
		Convenience	2
Planning	32	Planning	32
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.29: Question 4 Frequency Counts for Gosport

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	37	Ticketing	14
		Fares	23
		Car Parking	0
Infrastructure	**44**	**Congestion**	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	14
		Town/City Infrastructure	30
Integration	44	Access	7
		Connections	5
		Publicity/Information	32
Environment	1	Pollution	0
		Sustainable Travel	1
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	7	Capacity	0
		Community Buses	0
		Shared Services	7

Table A7.30: Question 5 Frequency Counts for Gosport

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	74	Ticketing	4
		Fares	16
		Car Parking	54
Infrastructure	**24**	**Congestion**	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	2
		Town/City Infrastructure	22
Integration	18	Access	13
		Connections	5
		Publicity/Information	0
Environment	0	Pollution	0
		Sustainable Travel	0
Time	13	RTI	0
		Journey Time	6
		Convenience	7
Planning	0	Planning	0
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.31: Question 1 Frequency Counts for Rochdale

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	19	Ticketing	0
		Fares	16
		Car Parking	3
Infrastructure	**25**	**Congestion**	11
		Cycle Paths	0
		Maintenance	12
		Road Layout	2
		Town/City Infrastructure	0
Integration	34	Access	34
		Connections	0
		Publicity/Information	0
Environment	11	Pollution	0
		Sustainable Travel	11
Time	19	RTI	0
		Journey Time	13
		Convenience	6
Planning	0	Planning	0
Service Issue	8	Capacity	7
		Community Buses	1
		Shared Services	0

Table A7.32: Question 2 Frequency Counts for Rochdale

Parent Node	Frequency	Child Node	Frequency
Safety and Security	3	Personal Security	0
		Safety	3
		Threat Perception	0
Finance	7	Ticketing	0
		Fares	7
		Car Parking	0
Infrastructure	0	Congestion	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	0
Integration	9	Access	8
		Connections	0
		Publicity/Information	1
Environment	11	Pollution	0
		Sustainable Travel	11
Time	20	RTI	20
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.33: Question 3 Frequency Counts for Rochdale

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	33	Congestion	9
		Cycle Paths	0
		Maintenance	11
		Road Layout	3
		Town/City Infrastructure	10
Integration	8	Access	8
		Connections	0
		Publicity/Information	0
Environment	10	Pollution	10
		Sustainable Travel	0
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	8	Planning	8
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.34: Question 4 Frequency Counts for Rochdale

Parent Node	Frequency	Child Node	Frequency
Safety and Security	4	Personal Security	0
		Safety	4
		Threat Perception	0
Finance	26	Ticketing	26
		Fares	0
		Car Parking	0
Infrastructure	2	Congestion	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	0
		Town/City Infrastructure	2
Integration	8	Access	4
		Connections	0
		Publicity/Information	4
Environment	10	Pollution	0
		Sustainable Travel	10
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	19	Capacity	0
		Community Buses	16
		Shared Services	3

Table A7.35: Question 5 Frequency Counts for Rochdale

Parent Node	Frequency	Child Node	Frequency
Safety and Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	18	Ticketing	1
		Fares	8
		Car Parking	9
Infrastructure	7	Congestion	0
		Cycle Paths	0
		Maintenance	0
		Road Layout	6
		Town/City Infrastructure	1
Integration	33	Access	32
		Connections	0
		Publicity/Information	1
Environment	2	Pollution	1
		Sustainable Travel	1
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	1	Capacity	1
		Community Buses	0
		Shared Services	0

Table A7.36: Question 1 Frequency Counts for Tameside (Hyde)

Parent Node	Frequency	Child Node	Frequency
Safety & Security	4	Personal Security	0
		Safety	2
		Threat Perception	2
Finance	2	Ticketing	1
		Fares	1
		Car Parking	0
Infrastructure	**25**	**Congestion**	**17**
		Cycle Paths	**1**
		Maintenance	**0**
		Road Layout	**7**
		Town/City Infrastructure	**0**
Integration	27	Access	10
		Connections	17
		Publicity/Information	0
Environment	9	Pollution	0
		Sustainable Travel	9
Time	13	RTI	0
		Journey Time	12
		Convenience	1
Planning	0	Planning	0
Service Issue	8	Capacity	1
		Community Buses	7
		Shared Services	0

Table A7.37: Question 2 Frequency Counts for Tameside (Hyde)

Parent Node	Frequency	Child Node	Frequency
Safety & Security	10	Personal Security	10
		Safety	0
		Threat Perception	0
Finance	14	Ticketing	3
		Fares	11
		Car Parking	0
Infrastructure	**8**	**Congestion**	**0**
		Cycle Paths	**0**
		Maintenance	**3**
		Road Layout	**0**
		Town/City Infrastructure	**5**
Integration	34	Access	15
		Connections	18
		Publicity/Information	1
Environment	0	Pollution	0
		Sustainable Travel	0
Time	17	RTI	16
		Journey Time	0
		Convenience	1
Planning	0	Planning	0
Service Issue	5	Capacity	5
		Community Buses	0
		Shared Services	0

Table A7.38: Question 3 Frequency Counts for Tameside (Hyde)

Parent Node	Frequency	Child Node	Frequency
Safety & Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	0	Ticketing	0
		Fares	0
		Car Parking	0
Infrastructure	**21**	**Congestion**	**13**
		Cycle Paths	**4**
		Maintenance	**4**
		Road Layout	**0**
		Town/City Infrastructure	**0**
Integration	0	Access	0
		Connections	0
		Publicity/Information	0
Environment	18	Pollution	18
		Sustainable Travel	0
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	11	Planning	11
Service Issue	0	Capacity	0
		Community Buses	0
		Shared Services	0

Table A7.39: Question 4 Frequency Counts for Tameside (Hyde)

Parent Node	Frequency	Child Node	Frequency
Safety & Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	11	Ticketing	9
		Fares	2
		Car Parking	0
Infrastructure	**0**	**Congestion**	**0**
		Cycle Paths	**0**
		Maintenance	**0**
		Road Layout	**0**
		Town/City Infrastructure	**0**
Integration	16	Access	2
		Connections	0
		Publicity/Information	14
Environment	0	Pollution	0
		Sustainable Travel	0
Time	0	RTI	0
		Journey Time	0
		Convenience	0
Planning	0	Planning	0
Service Issue	7	Capacity	0
		Community Buses	7
		Shared Services	0

Table A7.40: Question 5 Frequency Counts for Tameside (Hyde)

Parent Node	Frequency	Child Node	Frequency
Safety & Security	0	Personal Security	0
		Safety	0
		Threat Perception	0
Finance	1	Ticketing	0
		Fares	0
		Car Parking	1
Infrastructure	**6**	**Congestion**	**2**
		Cycle Paths	**0**
		Maintenance	**0**
		Road Layout	**0**
		Town/City Infrastructure	**4**
Integration	13	Access	2
		Connections	10
		Publicity/Information	1
Environment	0	Pollution	0
		Sustainable Travel	0
Time	3	RTI	0
		Journey Time	3
		Convenience	0
Planning	12	Planning	12
Service Issue	1	Capacity	0
		Community Buses	1
		Shared Services	0

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Annex A: Cohort survey - main sections

SECTION **A**

Your thoughts about various forms of transport

1. Firstly, we would like to ask you about travelling by **walking and cycling.** To what extent do you agree or disagree with the following statements?

Tick one box per row	STRONGLY AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
a. Walking is unsafe because of the traffic	☐	☐	☐	☐	☐
b. Cycling is unsafe because of the traffic	☐	☐	☐	☐	☐
c. The level of crime or anti-social behaviour means walking or cycling is unsafe	☐	☐	☐	☐	☐
d. There are pavements suitable for walking	☐	☐	☐	☐	☐
e. There are dedicated routes or paths for cycling	☐	☐	☐	☐	☐
f. The routes for walking and cycling are generally well lit at night	☐	☐	☐	☐	☐
g. The routes are pleasant for walking or cycling	☐	☐	☐	☐	☐
h. I am willing to cycle on the roads (e.g. to work/school/the shops)	☐	☐	☐	☐	☐
i. I would cycle more if there were more dedicated cycle paths	☐	☐	☐	☐	☐

2. Now we would like to ask you about travelling by **bus and train.** To what extent do you agree or disagree with the following statements?

Tick one box per row	STRONGLY AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
a. Bus services go where I need to go	☐	☐	☐	☐	☐
b. Train services go where I need to go	☐	☐	☐	☐	☐
c. Buses are a reliable/punctual form of travel	☐	☐	☐	☐	☐
d. Trains are a reliable/punctual form of travel	☐	☐	☐	☐	☐
e. Bus stops are conveniently located	☐	☐	☐	☐	☐
f. Train stations are conveniently located	☐	☐	☐	☐	☐
g. Bus journeys are pleasant	☐	☐	☐	☐	☐
h. Train journeys are pleasant	☐	☐	☐	☐	☐
i. The value for money of the bus ticket is generally satisfactory	☐	☐	☐	☐	☐
j. The value for money of the train ticket is generally satisfactory	☐	☐	☐	☐	☐
k. In general, I think that successful people tend to travel by car rather than by bus	☐	☐	☐	☐	☐
l. In general, I think that successful people tend to travel by car rather than by train	☐	☐	☐	☐	☐

3. Thinking about safety in terms of the **risk of accidents**, please rate **bikes, buses, trains and cars** in order of safety from the most safe to the least safe.

Tick one box per row	MOST SAFE	2ND SAFEST	3RD SAFEST	LEAST SAFE
Bikes	☐	☐	☐	☐
Buses	☐	☐	☐	☐
Trains	☐	☐	☐	☐
Cars	☐	☐	☐	☐

4. Thinking about personal safety, that is the **risk of being a victim of crime**, please rate **bikes, buses, trains and cars** in order of safety from the most safe to the least safe.

Tick one box per row	MOST SAFE	2ND SAFEST	3RD SAFEST	LEAST SAFE
Bikes	☐	☐	☐	☐
Buses	☐	☐	☐	☐
Trains	☐	☐	☐	☐
Cars	☐	☐	☐	☐

Continued

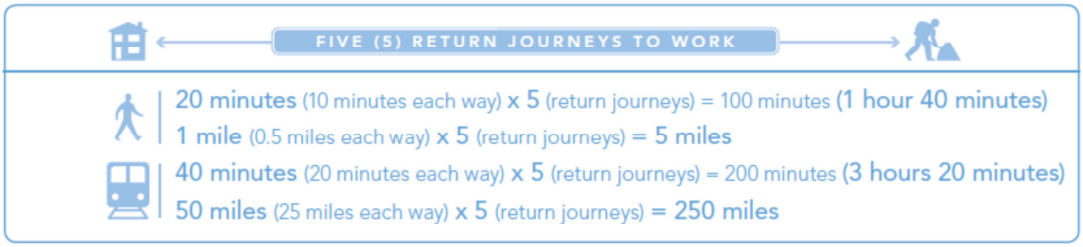
We'd now like to ask you about all your

journeys in the last seven days

using any method of transport and for **five** different journey purposes. Please complete any relevant questions, even if you don't travel around very much in general.

Please include all the journeys you made however long or short. If you used more than one method of travel, fill in the information for ALL methods of travel you used. Each return journey counts as one journey. For example if you travelled to work and back 5 times, this counts as 5 journeys. Where a return journey involves a number of purposes, please give the main purpose. If you spent time waiting for public transport please include this within the public transport journey time.

Here is an example for someone who walks and uses the train to/from work:



15. Thinking about your **journeys to and from work** (for example: travel to/from your place of work, accompanying your spouse to/from their work). Journeys during the course of work should not be included.

a. **How often** did you make such a journey over the last 7 days? ☐ TIMES ☐ **IF ZERO TIMES, TICK HERE AND GO TO QUESTION 16.**

b. **How much time in total** over the last 7 days did you spend **travelling to and from work** by:

	HOURS	MINUTES
Walking	☐	☐
Cycle	☐	☐
Bus	☐	☐
Train	☐	☐
Car, as a driver	☐	☐
Car, as a passenger	☐	☐
Other (please specify): _____	☐	☐

c. **How far** did you **travel in total** over the last 7 days **to and from work** by:

	MILES
Walking	☐
Cycle	☐
Bus	☐
Train	☐
Car, as a driver	☐
Car, as a passenger	☐
Other (please specify): _____	☐

16. Thinking about **your business journeys**, by which we mean any journeys in the course of your work or on employer's business (for example: travel to/from meetings, making deliveries, etc.) Journeys between your home and your main place (or places) of work should not be included.

a. **How often** did you make such a journey over the last 7 days? ☐ TIMES ☐ **IF ZERO TIMES, TICK HERE AND GO TO QUESTION 17.**

b. **How much time in total** over the last 7 days did you spend **travelling on business journeys** by:

	HOURS	MINUTES
Walking		
Cycle		
Bus		
Train		
Car, as a driver		
Car, as a passenger		
Other (please specify): _____		

c. **How far** did you **travel in total** over the last 7 days on **business journeys** by:

	MILES
Walking	
Cycle	
Bus	
Train	
Car, as a driver	
Car, as a passenger	
Other (please specify): _____	

17. Thinking about your **journeys to and from a place of study** (for example: travel to/from your university or college) or **to and from school** (for example: if you accompany a child to/from school).

a. **How often** did you make such a journey over the last 7 days? ☐ TIMES ☐ **IF ZERO TIMES, TICK HERE AND GO TO QUESTION 18.**

b. **How much time in total** over the last 7 days did you spend **travelling to and from a place of study or school** by:

	HOURS	MINUTES
Walking		
Cycle		
Bus		
Train		
Car, as a driver		
Car, as a passenger		
Other (please specify): _____		

c. **How far** did you **travel in total** over the last 7 days **to and from a place of study or school** by:

	MILES
Walking	
Cycle	
Bus	
Train	
Car, as a driver	
Car, as a passenger	
Other (please specify): _____	

Continued

18. Thinking about your **journeys for shopping** and **personal business** (for example: food shopping, non-food shopping, window-shopping, visiting a doctor, bank, solicitor or estate agents, visiting a relative in hospital, or accompanying someone else to a doctor, hospital etc.)

a. **How often** did you make such a journey over the last 7 days? ☐ TIMES ☐ **IF ZERO TIMES, TICK HERE AND GO TO QUESTION 19.**

b. **How much time in total** over the last 7 days did you spend **travelling** for **shopping and personal business** by:

	HOURS	MINUTES
Walking		
Cycle		
Bus		
Train		
Car, as a driver		
Car, as a passenger		
Other (please specify): _____		

c. **How far** did you **travel in total** over the last 7 days for **shopping and personal business** by:

	MILES
Walking	
Cycle	
Bus	
Train	
Car, as a driver	
Car, as a passenger	
Other (please specify): _____	

19. Thinking about your **journeys to visit friends and relatives and for other social activities** (for example: a journey to/from the cinema or other entertainment facilities).

a. **How often** did you make such a journey over the last 7 days? ☐ TIMES ☐ **IF ZERO TIMES, TICK HERE AND GO TO QUESTION 20.**

b. **How much time in total** over the last 7 days did you spend **travelling to visit friends or relatives and for other social activities** by:

	HOURS	MINUTES
Walking		
Cycle		
Bus		
Train		
Car, as a driver		
Car, as a passenger		
Other (please specify): _____		

c. **How far** did you **travel in total** over the last 7 days **to visit friends or relatives or for other social activities** by:

	MILES
Walking	
Cycle	
Bus	
Train	
Car, as a driver	
Car, as a passenger	
Other (please specify): _____	

Transport schemes in your area

SECTION C

20a. Now we would like to ask you about your awareness of travel schemes and transport infrastructure improvements in your area. To what extent are you aware of the following:

	Tick one box per row	NOT AWARE AT ALL	PARTLY AWARE	FULLY AWARE BUT NOT DIRECTLY AFFECTED	FULLY AWARE AND DIRECTLY AFFECTED
a.	Public Transport Interchange Improvements	☐	☐	☐	☐
b.	Bus Priority Measures	☐	☐	☐	☐
c.	Demand Responsive Transport / Community Transport	☐	☐	☐	☐
d.	Cycling Infrastructure Schemes	☐	☐	☐	☐
e.	Walking Infrastructure Schemes	☐	☐	☐	☐
f.	Car Sharing Schemes	☐	☐	☐	☐
g.	College Travel Plans	☐	☐	☐	☐
h.	Personalised Travel Plans	☐	☐	☐	☐
i.	Workplace Travel Plans	☐	☐	☐	☐
j.	Station Travel Plans	☐	☐	☐	☐
k.	School Travel Plans	☐	☐	☐	☐
l.	Area Travel Plans?	☐	☐	☐	☐

20b. To what extent have the following travel schemes and improvements to transport infrastructure in your local area affected your travel behaviour over the last year:

	Tick one box per row	MY BEHAVIOUR DIDN'T CHANGE	MY BEHAVIOUR CHANGED A LITTLE	MY BEHAVIOUR CHANGED A LOT
a.	Public Transport Interchange Improvements	☐	☐	☐
b.	Bus Priority Measures	☐	☐	☐
c.	Demand Responsive Transport/Community Transport	☐	☐	☐
d.	Cycling Infrastructure Schemes	☐	☐	☐
e.	Walking Infrastructure Schemes	☐	☐	☐
f.	Car Sharing Schemes	☐	☐	☐
g.	College Travel Plans	☐	☐	☐
h.	Personalised Travel Plans	☐	☐	☐
i.	Workplace Travel Plans	☐	☐	☐
j.	Station Travel Plans	☐	☐	☐
k.	School Travel Plans	☐	☐	☐
l.	Area Travel Plans	☐	☐	☐
m.	Other? (Please specify): _____	☐	☐	☐

Continued

Annex B: Primary intervention locations

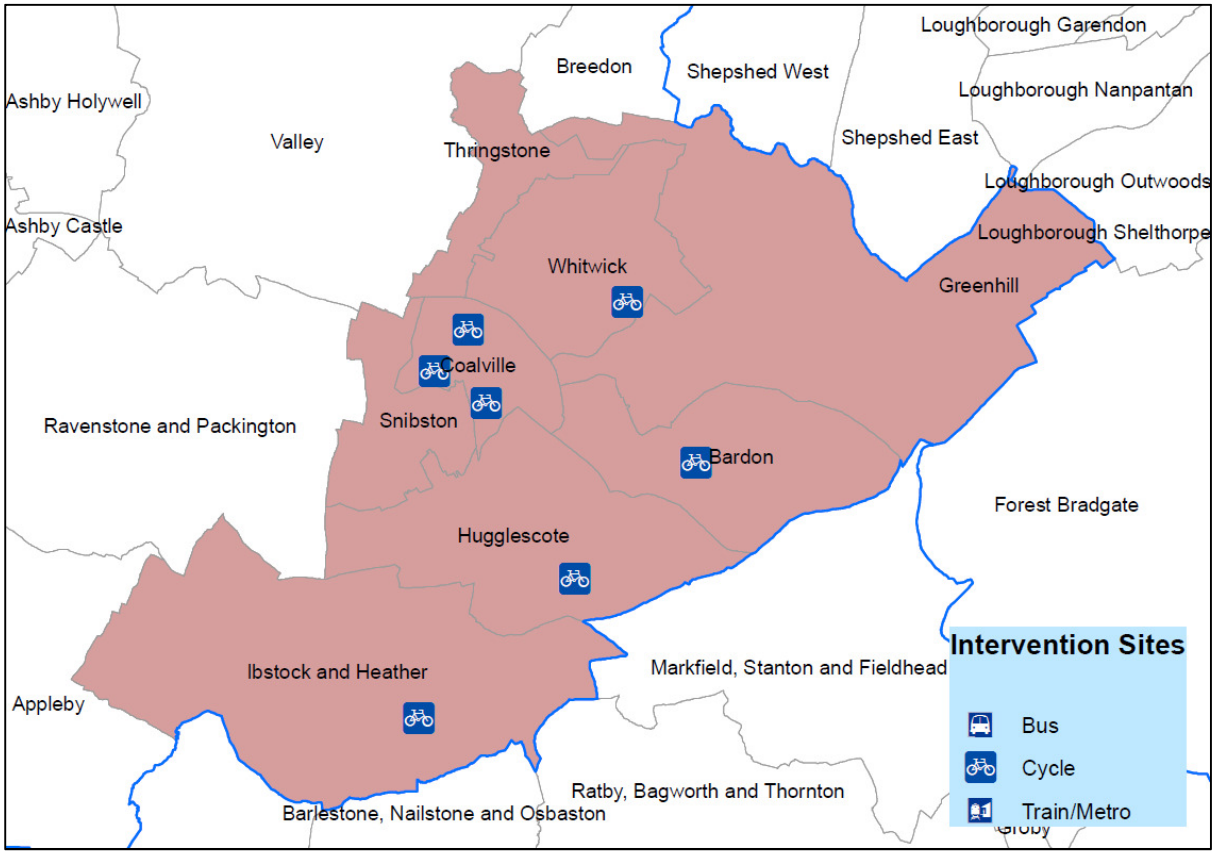


Figure A1: Coalville wards (Leicestershire) showing Primary Intervention sites

Data from 2011 Census:

	Total Population	Population 15 plus
Bardon	3,373	2,621
Coalville	5,988	4,869
Greenhill	6,907	5,648
Ibstock	7,121	5,891
Hugglescote	4,792	3,887
Snibston	5,143	4,146
Thringstone	4,367	3,702
Whitwick	6,867	5,796
TOTAL	44,558	36,554

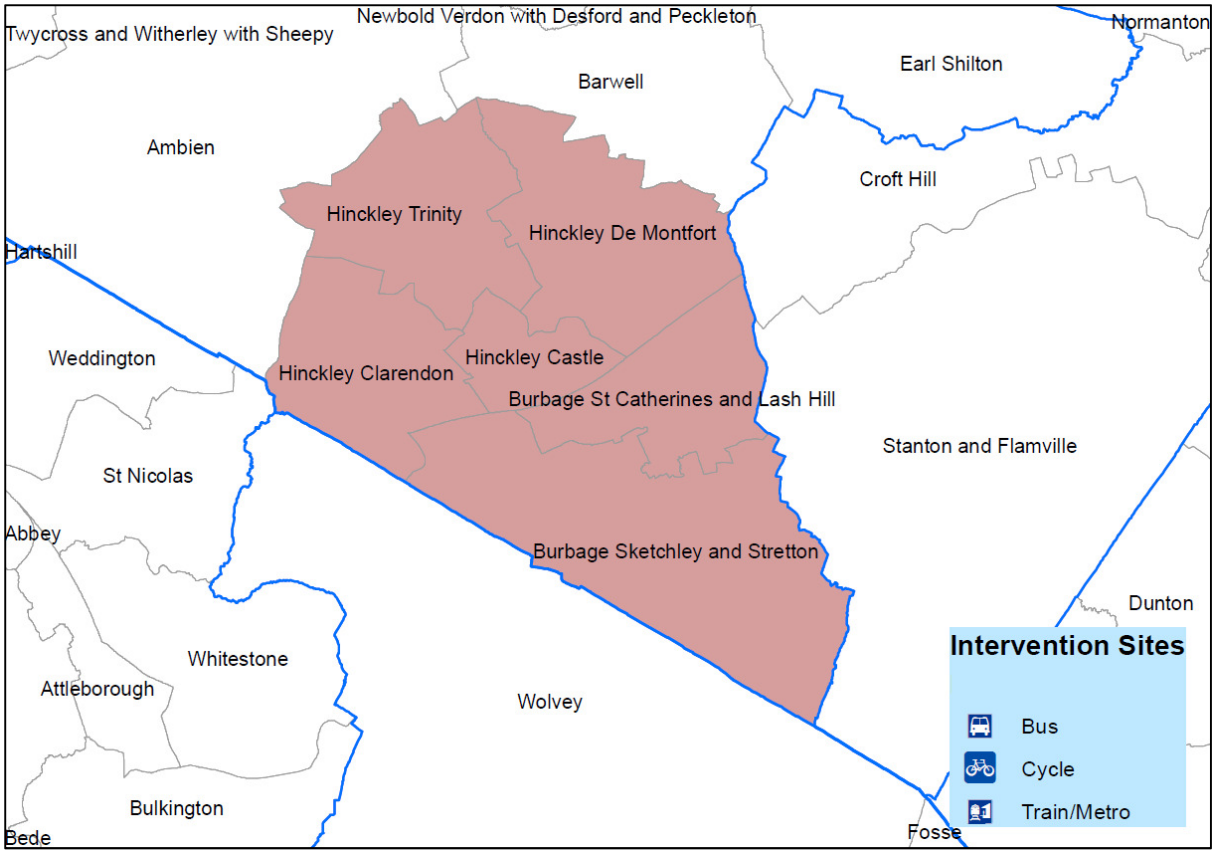


Figure A2: Hinckley wards (Leicestershire control area)

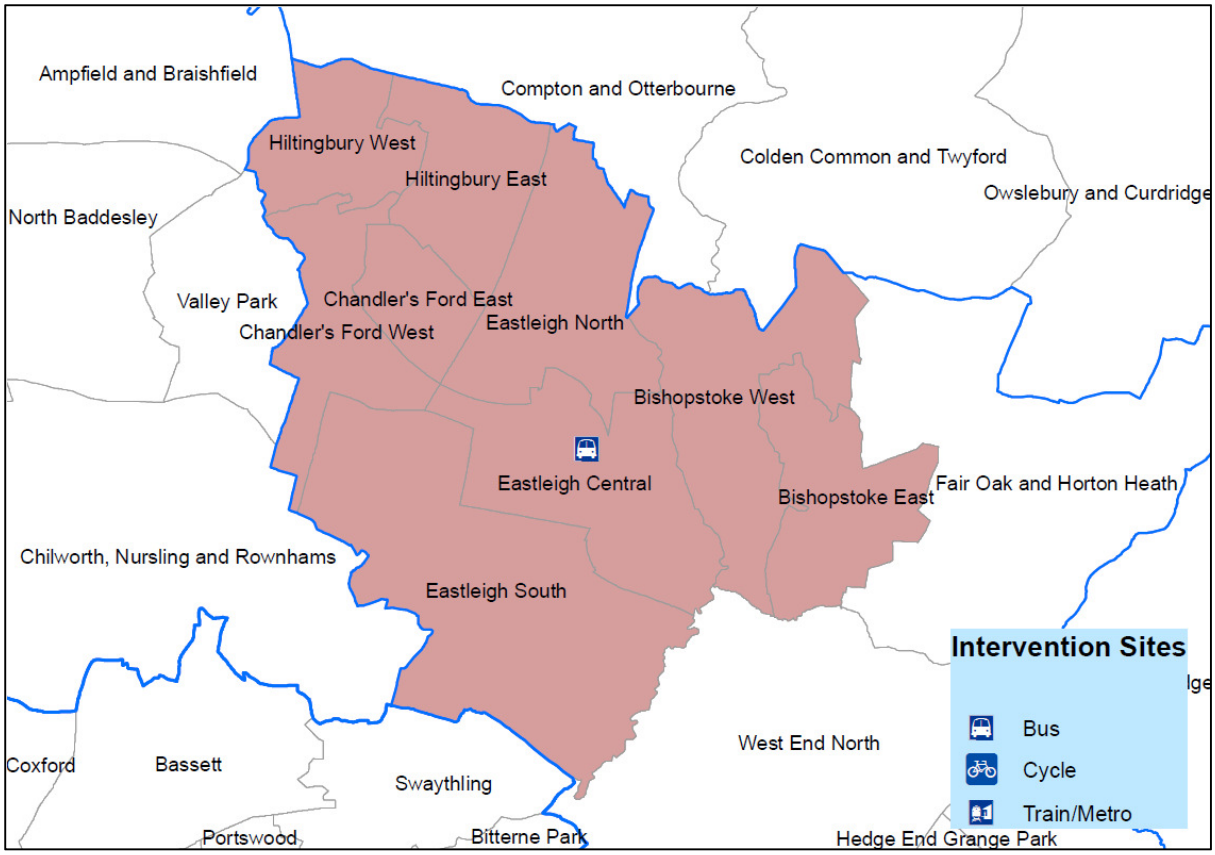


Figure A3: Eastleigh wards (TfSH) showing Primary Intervention sites

Figure A4: Fareham / Lock's Heath wards (TfSH control area)

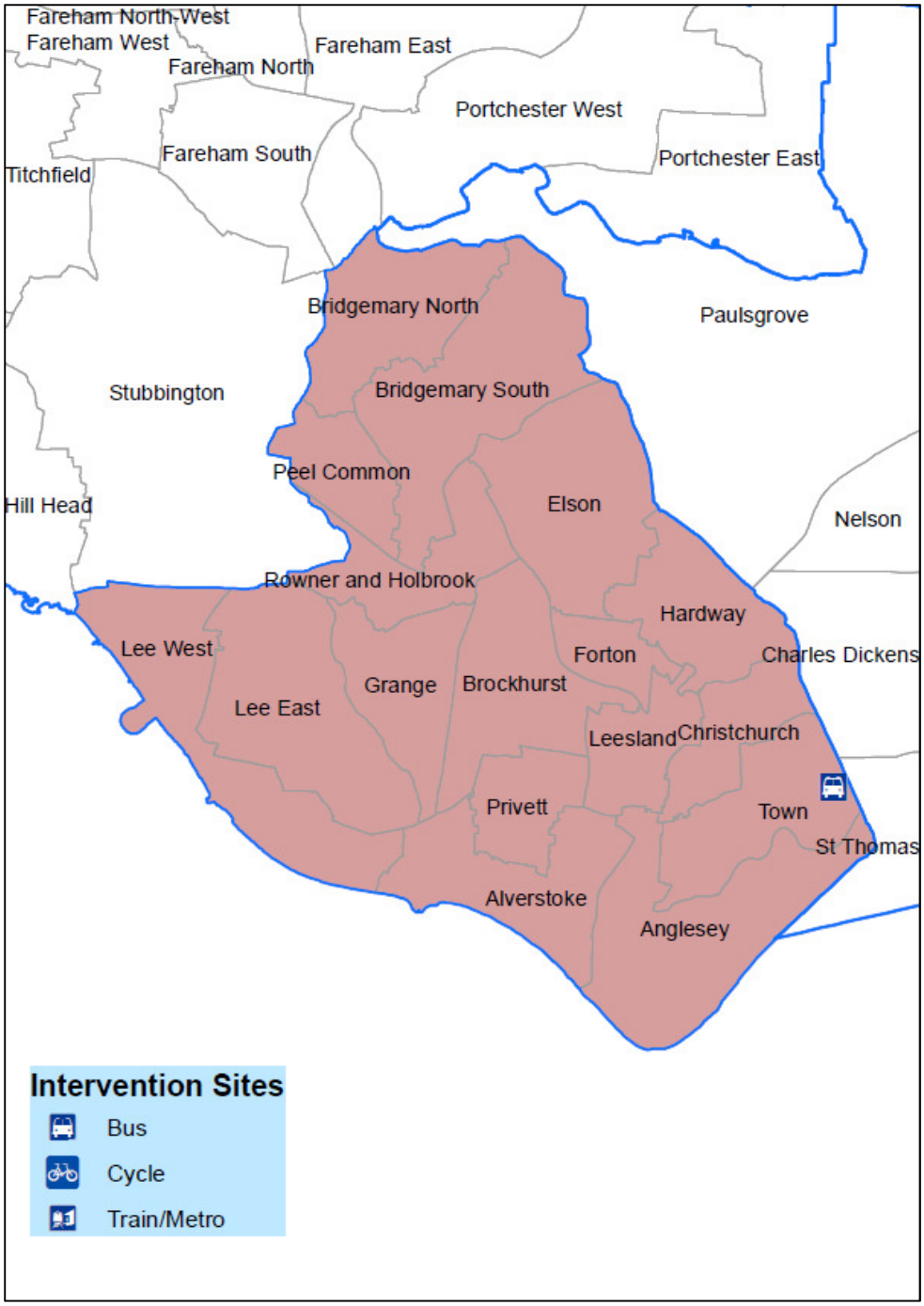


Figure A5: Gosport wards (TfSH) showing Primary Intervention sites

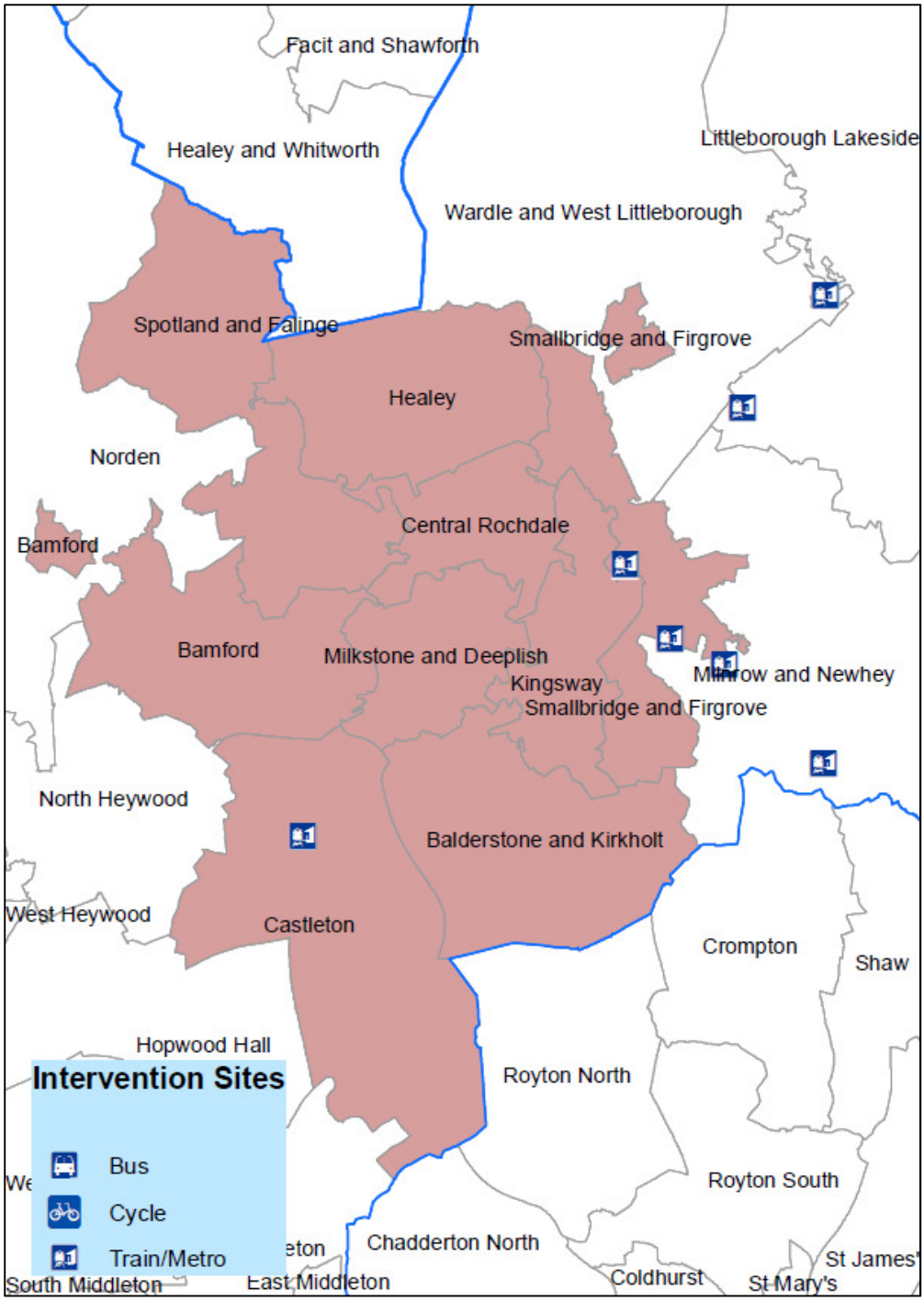
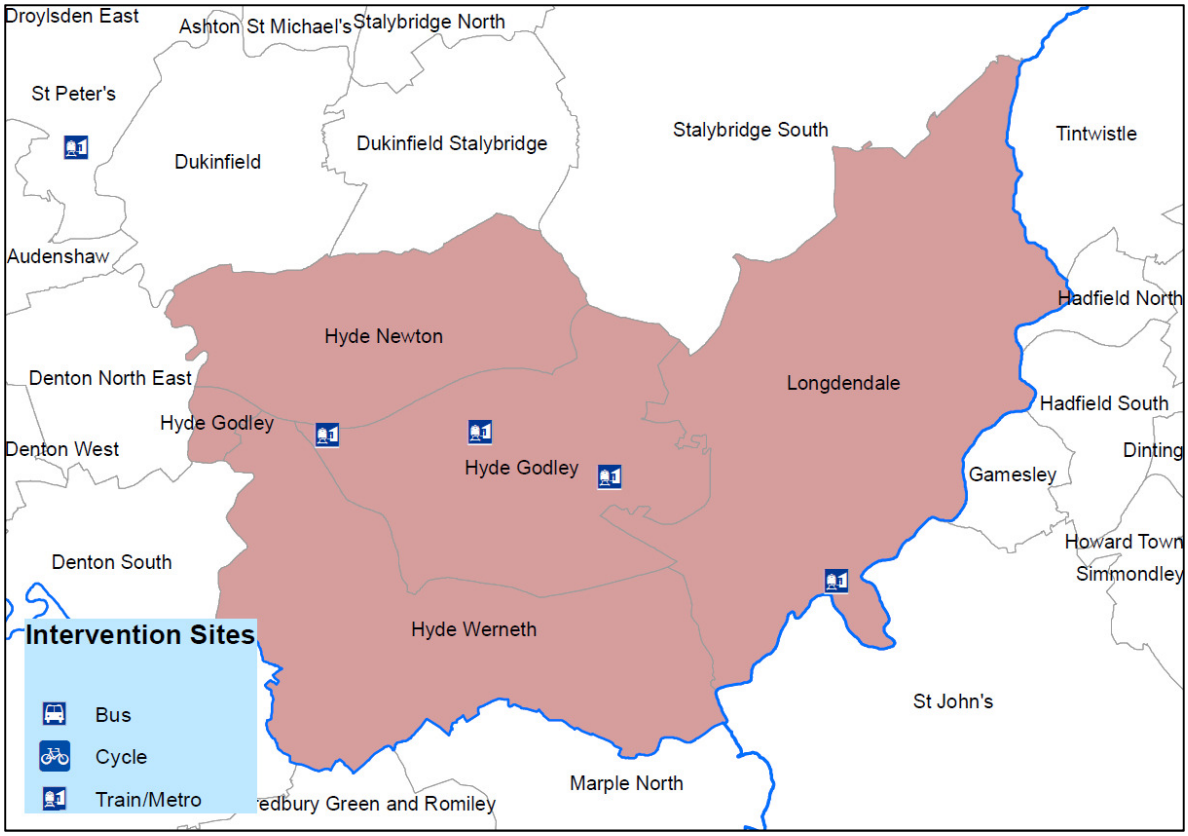


Figure A6: Rochdale wards (Greater Manchester) showing Primary Intervention sites



FigureA7: Tameside wards (Greater Manchester) showing Primary Intervention sites

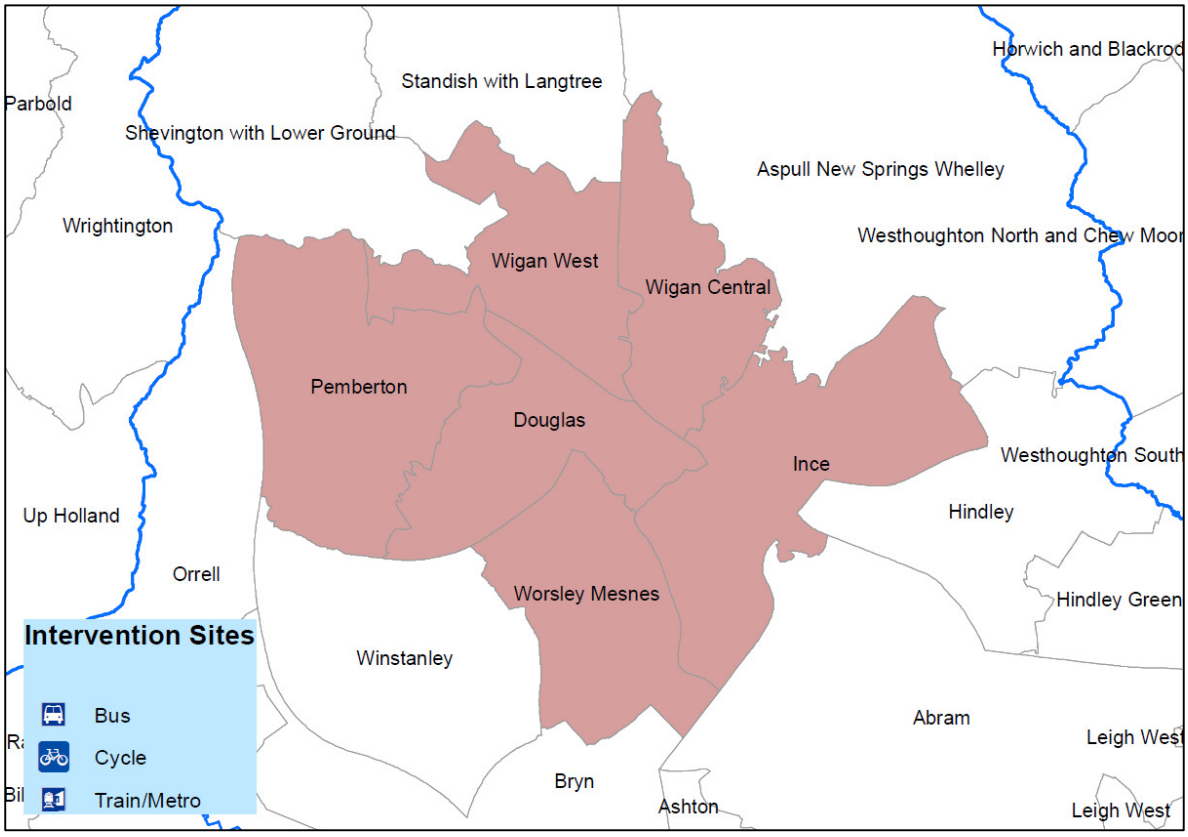


Figure A8: Wigan wards (TfGM control area)

Annex C: Data Entry and Consistency Check Guidance

This coding is designed for data entry into fields of the designated template - initially default to '-99' for not answered (or 'missing')

Dealing with improperly-provided answers (see also the specific coding instructions for each variable, as given further below)

[1] Dealing with Ranges

When a value range has been given when only one value is appropriate, enter in the form "(-44) A TO B". For example, if "1-3" was given as an answer when a single numeric value like "2" was expected, code as "(-44) 1 TO 3". An Example:

Field Name	What was written	What to enter
Q15bWorkWalkDist	4 – 8	(-44) 4 TO 8

[2] Dealing with Multiple Selections

When multiple options have been selected instead of the single option expected (e.g. when a single box should have been ticked), enter in the form "(-88) A AND B AND C AND D….". For example, if columns with a value of 1 and 3 were both selected, code as "(-88) 1 AND 3". For multiple selections always put numbers in ascending order. An Example:

Field Name	What was ticked	What to enter
Q2aBusAccess	'Strongly agree' AND 'Agree'	(-88) 1 AND 2

[3] Dealing with Text <u>associated</u> with a Number

- If a numeric answer is expected (e.g. Number of Bikes), but the answer is written as text, e.g. "ONE", "TWO" or "NONE", enter the numeric equivalent, i.e. 1, 2 or 0.
- If an integer 'x' is expected, but the answer is given as 'about', "maybe", "circa (c.)", "greater" or "less than" x, then enter x only.
- If a fraction is given as text, e.g. "A THIRD" or "1/2", then enter this as a **decimal**, i.e. 0.333 (to 3 decimal places) or 0.5, <u>except</u> where an integer is expected, in which case round down if <0.5, and round up if >=0.5.
- If the right units are added as text (or abbreviated text) to the number, e.g. "12 MILES" or "5 MINS", then enter the number ONLY, i.e. 12 or 5.

[4] **Answers given in wrong units**

Some questions may have answers given in the wrong units, please code as "(-10) plus text as written". For example, if a question asked how many miles travelled, and respondent has written "12km" please enter "(-10) 12 km". (This is not to be confused with where the right units are given, e.g. "12 Miles" should be entered as 12.)

[5] **Alternative Answer given for a forced response item**

When other text or an alternative reply has been written for a forced response item, this should be entered in the form "(-10) plus text as written". An Example (e.g. where the answer should have been a number or one of a set of pre-defined responses):

Field Name	**What was written**	**What to enter**
Q21WorkType	Working 30 hours a week	(-10) Working 30 hours a week

[6] **Unable to enter answer or other reasoning given**

If the respondent does not know the answer, e.g. "Don't know", "N/A", "No idea", or "Unknown", then leave this as missing (enter -99). Otherwise, if an answer is given, but it does not fit into any of the other five situations above, please code as "(-10) plus the text and/or number" exactly as written.

If **any other text** has been written on the page, that provides further information for an answer (e.g. "I go to the hospital every week"), or is beyond the scope of a particular question or section (e.g. "mind your own business"), then enter this text under **'Additional Comments'** (the last column on the data entry sheet).

Front-page of Travel Survey			
Page	Number/Description	Variable Names (Header)	Variable Details
3	ID number	ID	Enter 7-digit code, e.g. P13-0000 ID code appears on the top right corner of the Travel Survey Front-page (page 3). If the Front-page is missing, enter: HAM-0000 (for surveys with 'University of Southampton' logo on page 3) LEI-0000 (for surveys with 'Leicestershire County Council' logo on page 3) MAN-0000 (for survey with 'Transport for Greater Manchester' logo on page 3)

Section A			
4	1. Perceptions of **walking and cycling**	Q1aWalkUnsafe Q1bCycleUnsafe Q1cCrime Q1dWalkPavement Q1eCycleRoute Q1fLighting Q1gPleasantRoute Q1hCycleOnRoad Q1iCycleMore	Strongly agree = 2 Somewhat agree = 1 Neither agree nor disagree = 0 Somewhat disagree = -1 Strongly disagree = -2 Not answered = -99 Multiple answers = -88
	2. Perceptions of **bus and train**	Q2aBusAccess Q2bTrainAccess Q2cBusReliable Q2dTrainReliable Q2eBusConvenient Q2fTrainConvenient Q2gBusPleasant Q2hTrainPleasant Q2iBusTicket Q2jTrainTicket Q2kBusCompare Q2lTrainCompare	Strongly agree = 2 Somewhat agree = 1 Neither agree nor disagree = 0 Somewhat disagree = -1 Strongly disagree = -2 Not answered = -99 Multiple answers = -88
5	3. Rank of modes by the **risk of accidents**	Q3Bikes Q3Buses Q3Trains Q3Cars	Most safe = 1 2nd safest = 2 3rd safest = 3 Least safe = 4 Not answered = -99 Multiple answers = -88
	4. Rank of modes by the **risk of being a victim of crime**	Q4Bikes Q4Buses Q4Trains Q4Cars	As above

Section B			
6	5. Number of vehicles in household	Q5AdultBikes Q5ChildBikes Q5CompanyCars Q5PrivateCars Q5Motorcycles Q5DisabilityScooter	Enter integer as stated (including 0) If decimal provided <0.5 round down If decimal provided >= 0.5 round up Not answered = -99 Multiple answers = -88
		Q5NoAdultBikes Q5NoChildBikes Q5NoCompanyCars Q5NoPrivateCars Q5NoMotorcycles Q5NoDisabilityScooter	No mark = -99 If ticked, check the corresponding value entered above (e.g. Q5AdultBikes for Q5NoAdultBikes, Q5ChildBikes for Q5NoChildBikes, etc.): - if the value is zero or not answered → 1 - if the value is greater than zero (> 0) → -99 (treat as missing) Note: If this box is ticked (= 1) and the corresponding value above is not answered, replace the -99 value above with 0
	6. Important factors when buying a household car or van	Q6Cost Q6Engine Q6Speed Q6Style Q6Environment	**Yes**, it is important = 1 **No**, it does not matter = 2 If neither 'Yes' nor 'No' marked = -99 (treat as not answered) If both 'Yes' and 'No' marked, also = -99 (treat as missing)
	7. Travel by car	Q7CarJourney	**Yes** = 1 **No** = 2 If neither 'Yes' nor 'No' marked = -99 (not answered) If both 'Yes' and 'No' selected = -88 (treat as multiple answers)
	8. Property of main car	Q8Model	Enter text. Note: respondent may state more than one vehicle in the text. Not answered = -99
		Q8Fuel	Petrol = 1 Diesel = 2 Other = 3 Not answered = -99 Multiple answers = -88
		Q8FuelOtherSpecify	Enter text as specified, e.g. 'electric' (i.e. fully electric), 'hybrid' (i.e. electric and petrol

			hybrid), 'gas', 'LPG' (i.e. liquid petroleum gas - a subset of gas), 'biofuel' or 'other'. Not answered = -99
		Q8EngineSize	Less than 1.4 litres = 1 1.4-2.0 litres = 2 More than 2.0 litres = 3 Not answered = -99 Multiple answers = -88
		Q8Ageof Vehicle (in Years)	If number stated → enter number as is (do not enter 'Years', if this is also stated) If 'New' stated (instead of a number) → enter number as 0 If a range is given, e.g. 2-3 Years → enter the mid-point, e.g. 2.5 If 'about', 'maybe', greater' or 'less than' x Years → then enter x If the age is provided in different units, e.g. 1 year 6 months → convert to years, e.g. 1.5 If just a car registration or other text given → -10 and enter text as given Multiple answers = -88, as respondents may have 2 cars Not answered = -99
	9. Frequency of flight journeys	Q9aWithinUK Q9bShortHaul Q9cLongHaul	No flights = 1 1 flight = 2 2 flights = 3 3 flights or more = 4 Not answered = -99 Multiple answers = -88
7	10. Five minutes walking ability	Q10Walk5Mins	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
	11. Cycling ability and activity	Q11aCycle5Min	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q11bCycleLast	Within a week = 1 Within a month = 2 Within a year = 3

			More than a year ago = 4 I've never ridden a bicycle = 5 I can't remember = 6 Not answered = -99 Multiple answers: - If 6 (I can't remember) is given with any other answer → 6 only, otherwise = -88
	12. Bus ability and activity	Q12aBusOneself	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q12bBusStop	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q12cBusLast	Within a week = 1 Within a month = 2 Within a year = 3 More than a year ago = 4 I've never taken a bus = 5 I can't remember = 6 Not answered = -99 Multiple answers: - If 6 (I can't remember) is given with any other answer → 6 only, otherwise = -88
	13. Train ability and activity	Q13aTrainOneself	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q13bTrainStop	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q13cTrainLast	Within a week = 1

			Within a month = 2 Within a year = 3 More than a year ago = 4 I've never taken a train = 5 I can't remember = 6 Not answered = -99 Multiple answers: - If 6 (I can't remember) is given with any other answer → 6 only, else = -88
	14. Home shopping	Q14aFoodShopping Q14bNonFoodShopping	Regularly = 1 Sometimes = 2 Only done this once or twice = 3 Never = 4 Don't know = 5 Not answered = -99 Multiple answers = -88
Section B: seven day travel diary			
8	15. **Work journeys**	Q15aWorkFrequency ('Times')	Enter integer, including 0 If decimal provided <0.5 round down If decimal provided >= 0.5 round up If a range given, e.g. 2-5 → mid-point or the closest integer to the mid-point, e.g. 4 Not answered = -99
		Q15aNoWorkJourneys	No mark = -99 If ticked, check the corresponding frequency entered above: - if frequency is zero or not answered → 1 - if frequency is greater than zero (> 0) → -88 (1 AND FREQUENCY NOT ZERO)
		Q15bWorkWalkH Q15bWorkWalkM Q15bWorkCycleH Q15bWorkCycleM Q15bWorkBusH Q15bWorkBusM Q15bWorkTrainH Q15bWorkTrainM	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99

		Q15bWorkDriveH Q15bWorkDriveM Q15bWorkPassH Q15bWorkPassM Q15bWorkOtherH Q15bWorkOtherM	
		Q15bWorkOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
		Q15cWorkWalkDist Q15cWorkCycle Dist Q15cWorkBusDist Q15cWorkTrainDist Q15cWorkDriveDist Q15cWorkPassDist Q15cWorkOtherDist	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q15cWorkOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3

			- Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
9	Q16. **Business journeys**	Q16aBusiFrequency ('Times')	Enter integer, including 0 If decimal provided <0.5 round down If decimal provided >= 0.5 round up If a range given, e.g. 2-5 → mid-point or the closest integer to the mid-point, e.g. 4 Not answered = -99
		Q16aNoBusiJourneys	No mark = -99 If ticked, check the corresponding frequency entered above: - if frequency is zero or not answered → 1 - if frequency is greater than zero (> 0) → -88 (1 AND FREQUENCY NOT ZERO)
		Q16bBusiWalkH Q16bBusiWalkM Q16bBusiCycleH Q16bBusiCycleM Q16bBusiBusH Q16bBusiBusM Q16bBusiTrainH Q16bBusiTrainM Q16bBusiDriveH Q16bBusiDriveM Q16bBusiPassH Q16bBusiPassM Q16bBusiOtherH	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99

		Q16bBusiOtherM	
		Q16bBusiOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
		Q16cBusiWalkDist Q16cBusiCycle Dist Q16cBusiBusDist Q16cBusiTrainDist Q16cBusiDriveDist Q16cBusiPassDist Q16cBusiOtherDist	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q16cBusiOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8

			- Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
	Q17. **School journeys**	Q17aStudyFrequency ('Times')	Enter integer, including 0 If decimal provided <0.5 round down If decimal provided >= 0.5 round up If a range given, e.g. 2-5 → mid-point or the closest integer to the mid-point, e.g. 4 Not answered = -99
		Q17aNoStudyJourneys	No mark = -99 If ticked, check the corresponding frequency entered above: - if frequency is zero or not answered → 1 - if frequency is greater than zero (> 0) → -88 (1 AND FREQUENCY NOT ZERO)
		Q17bStudyWalkH Q17bStudyWalkM Q17bStudyCycleH Q17bStudyCycleM Q17bStudyBusH Q17bStudyBusM Q17bStudyTrainH Q17bStudyTrainM Q17bStudyDriveH Q17bStudyDriveM Q17bStudyPassH Q17bStudyPassM Q17bStudyOtherH Q17bStudyOtherM	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q17bStudyOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3

			- Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
		Q17cStudyWalkDist Q17cStudyCycle Dist Q17cStudyBusDist Q17cStudyTrainDist Q17cStudyDriveDist Q17cStudyPassDist Q17cStudyOtherDist	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q17cStudyOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99

10	Q18. **Personal journeys**	Q18aPersonalFrequency ('Times')	Enter integer, including 0 If decimal provided <0.5 round down If decimal provided >= 0.5 round up If a range given, e.g. 2-5 → mid-point or the closest integer to the mid-point, e.g. 4 Not answered = -99
		Q18aNoPersonalJourneys	No mark = -99 If ticked, check the corresponding frequency entered above: - if frequency is zero or not answered → 1 - if frequency is greater than zero (> 0) → -88 (1 AND FREQUENCY NOT ZERO)
		Q18bPersonalWalkH Q18bPersonalWalkM Q18bPersonalCycleH Q18bPersonalCycleM Q18bPersonalBusH Q18bPersonalBusM Q18bPersonalTrainH Q18bPersonalTrainM Q18bPersonalDriveH Q18bPersonalDriveM Q18bPersonalPassH Q18bPersonalPassM Q18bPersonalOtherH Q18bPersonalOtherM	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater' , 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q18bPersonalOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8

			- Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
		Q18cPersonalWalkDist Q18cPersonalCycle Dist Q18cPersonalBusDist Q18cPersonalTrainDist Q18cPersonalDriveDist Q18cPersonalPassDist Q18cPersonalOtherDist	If only a number given, enter number as is If 'don't know'-type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q18cPersonalOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
	Q19. **Social Journeys**	Q19aSocialFrequency ('Times')	Enter integer, including 0 If decimal provided <0.5 round down If decimal provided >= 0.5 round up If a range given, e.g. 2-5 → mid-point or the closest integer to the mid-point, e.g. 4 Not answered = -99

		Q19aNoSocialJourneys	No mark = -99 If ticked, check the corresponding frequency entered above: - if frequency is zero or not answered → 1 - if frequency is greater than zero (> 0) → -88 (1 AND FREQUENCY NOT ZERO)
		Q19bSocialWalkH Q19bSocialWalkM Q19bSocialCycleH Q19bSocialCycleM Q19bSocialBusH Q19bSocialBusM Q19bSocialTrainH Q19bSocialTrainM Q19bSocialDriveH Q19bSocialDriveM Q19bSocialPassH Q19bSocialPassM Q19bSocialOtherH Q19bSocialOtherM	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q19bSocialOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99

		Q19cSocialWalkDist Q19cSocialCycle Dist Q19cSocialBusDist Q19cSocialTrainDist Q19cSocialDriveDist Q19cSocialPassDist Q19cSocialOtherDist	If only a number given, enter number as is If 'don' t know' -type answer or box just ticked → -99 (treat as missing) If 'greater', 'less than' or 'about' x → then enter x If a range given → -44 Not answered = -99
		Q19cSocialOtherSpecify	Where 'other' travel mode is stated, code according to the following: - Taxi → 1 - Van, LGV (light goods vehicle), caravan or Ambulance → 2 - Mini-bus, employer-bus or taxi-bus → 3 - Coach → 4 - Truck, lorry, HGV (Heavy goods vehicle) or Fire Engine → 5 - Motorcycle or motorbike → 6 - Motor scooter, moped or electric scooter → 7 - Airplane, plane, flying or flight → 8 - Tube, subway, metro or Underground → 9 - Ferry, ship, boat or water-bus → 10 - Mobility or disability scooter, horse, sailing and tram → 11 If the stated text does not fall into one of the above categories → then enter text as is Not answered = -99
Section C			
11	20a. Awareness of various schemes	Q20aaInterchange Q20abBusPriority Q20acDRT Q20adCycleInfra Q20aeWalkInfra Q20afCarShare Q20agCTP Q20ahPTP Q20aiWTP Q20ajSTP	Not aware at all = 1 Partly aware = 2 Fully aware but not directly affected = 3 Fully aware and directly affected = 4 Not answered = -99 Multiple answers: - if 1 (not aware at all) AND 2 (partly aware) → then 2; otherwise = -88

		Q20akSchTP Q20alATP	
	20b. Affected travel behaviour	Q20baInterchange Q20bbBusPriority Q20bcDRT Q20bdCycleInfra Q20beWalkInfra Q20bfCarShare Q20bgCTP Q20bhPTP Q20biWTP Q20bjSTP Q20bkSchTP Q20blATP	My behaviour didn't change = 1 My behaviour changed a bit = 2 My behaviour changed a lot = 3 Not answered = -99 Multiple answers = -88
		Q20bmOtherSpecify	Enter text as is
		Q20bmOtherChange	My behaviour didn't change = 1 My behaviour changed a bit = 2 My behaviour changed a lot = 3 Not answered = -99 Multiple answers = -88
Section D			
12	21. Type of work	Q21WorkType	Doing paid work full-time = 1 Doing paid work part-time = 2 Full-time student = 3 Part-time student = 4 Part-time work and part-time student = 5 Unemployed = 6 Retired = 7 Looking after home or family = 8 Permanently sick or disabled = 9 Other = 10 Not answered = -99

			Multiple answers = -88
		Q21WorkOtherSpecify	Enter text Not answered = -99
	22. Main place of work or study	Q22aWorkPostcode	Enter text Not answered = -99
		Q22bWorkAddress	Enter text Not answered = -99
	23. Occupation of the chief wage earner	Q23aOccupationCWE	Senior Managerial/Professional = 1 Middle Managerial/Professional = 2 Junior Managerial/Clerical/Supervisory = 3 Skilled Manual (with professional qualifications/served an apprenticeship) = 4 Unskilled Manual (no qualifications/not served an apprenticeship) = 5 Full time student = 6 Retired = 7 Unemployed/ between jobs = 8 Housewife/ househusband = 9 Other = 10 Not answered = -99 Multiple answers = -88
		Q23aOtherOccSpecify	Enter text Not answered = -99
		Q23bRepondentCWE	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
		Q23cSelfEmployed	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
Section E			
13	24. Gender of respondent	Q24Gender	Male = 1 Female = 2

			Not answered = -99 Multiple answers = -88
	25. Age of respondent	Q25Age	Enter number as is Not answered = -99 Range entered = -44
	26. Indoor Weight	Q26WeightStone Q26WeightPound Q26WeigthKG	Enter number as is Not answered = -99 Range entered = -44
	27. Height	Q27HeightFoot Q27HeightInch Q27HeightCM	Enter number as is Not answered = -99 Range entered = -44
	28. Any long-term health problems	Q28Illness	Yes = 1 No = 2 Not answered = -99 Multiple answers = -88
	29. Thought on own health condition	Q29Health	Excellent =1 Good = 2 Fair = 3 Poor = 4 Not answered = -99 Multiple answers = -88
	30. Ethnic identity	Q30Ethnicity	White = 1 Mixed ethnic group = 2 Asian or Asian British = 3 Black or Black British = 4 Other = 5 Not answered = -99 Multiple answers = -88
		Q30OtherEthnicSpecify	Enter text Not answered = -99
	31. Educational qualification	Q31Education	Higher Degree, Degree, NVA4, NVQ5 or equivalent = 1 BTEC (higher), BEC (higher), TEC (higher), HNC, HND or equivalent = 2

			GCE A' Level, NVA3, Scottish Higher or equivalent = 3 BTEC (National), BEC (National), TEC (National), ONC, OND or equivalent = 4 GSE A to C, GCSE 'O' Level, CSE Grade Q1, NV2 or equivalent = 5 Other qualifications = 6 No formal qualifications = 7 Not answered = -99 Multiple answers = -88
	32. Home post code	Q32HomePostcode	Enter text Not answered = -99
	33. Duration of staying at current home	Q33CurrentHomeYear Q33CurrentHomeMonth	Enter number as is Not answered = -99
14	34. Number of family members	Q34Babies Q34Children Q34Adults	Enter as integer If decimal provided <0.5 round down If decimal provided >= 0.5 round up Not answered = -99
	35. Tenure type	Q35Tenure	Rent it from the council, a housing association or a charity = 1 Rent it from a private landlord or letting agency = 2 Partly owns it and partly rents it (shared ownership) = 3 Owns it (including buying with a mortgage) = 4 Other = 5 Not answered = -99 Multiple answers = -88
		Q35TenureOther	Enter any additional text where specified with 'Other', else leave as -99
	36. Household income per year	Q36Income	Up to £10,000 = 1 £ 10,001 - £ 20,000 = 2 £ 20,001 - £ 30,000 = 3 £ 30,001 - £ 40,000 = 4 £ 40,001 - £ 50,000 = 5 £ 50,001 - £ 75,000 =6

			More than £ 75,000 = 7 Don't know = 8 Not answered = -99 Multiple answers = -88
	37. Other comments	Q37Comments	Enter text where specified. Ignore 'Don't know', 'N/A', 'No, 'None' etc. (= -99) Not answered = -99
Any	Additional comments	For recording any other comments made by the respondent, which is not entered elsewhere [hence no question numbering]	Enter text as written, and the question or page it relates to, e.g. "(Q11) - N/A", or "(page 8) - Retired" Not answered = -99

Annex D: Mapping of Thornton et al. (2011)'s "Golden Questions" to Carbon Case Study Survey Questions and Segment Determination Process

1. Determination of Car Ownership

The segmentation model and algorithm proposed by Thornton et al. (2011) [1] differentiates between car and non-car owners through a series of 'Golden Questions'. The following table provides a comparison between how car and non-car owners are differentiated between Thornton et al. and the Carbon Case Study cohort survey questions for the before survey.

Thornton et al. (2011) Criteria	Survey Criteria
B5 - How many vehicles does your household own or have continuous use of at present? Car-owner=1 or more; Non-owner=No cars.	**5 - How many of the following vehicles are kept in your household? (Include all vehicles kept overnight)** **- Private cars and vans (Write in number);** **- Tick if Zero *Private* Cars;** **- Company cars and vans (Write in number); and** **- Tick if Zero *Company* Cars** *Car-owner*: Private Car Number = 1* or more, OR (Private Car Number is 0 or Missing or if 'Zero Private Cars' is Ticked) AND Company Car Number = 1 or more**; *Non-owner*: Private Car Number = 0*** and/*or* if 'Zero Private Cars' was ticked**** AND Company Car Number = 0 and/*or* if 'Zero Company Cars' was ticked; *Missing*: The Number *and* Tick if Zero are *both* missing for Private *and* Company Cars ;

* includes records where the Number box was ticked or a car registration number was given instead (converted Number to 1)

** includes records where 'Number of Company car/van' was >0 but 'Tick if zero' for Private cars and Number were 0 or missing

*** includes records where an incorrect entry was given for 'Number', i.e. 'Taxis' and 'N/A' (converted Number to 0 and 'Tick if Zero')

**** excludes records where 'Tick if Zero' was ticked, but the number of cars was not zero ('Tick' converted to 'Missing')

While Thornton et al. used one question to determine car-ownership, the survey applied a set of four questions, which made the segmentation process more complicated. Initially, it was suggested that the number of car-owners could be those where the 'Number of Private Cars and Vans' kept overnight is *not* zero or missing, and therefore non-owners could be those where this Number is zero *and/or* where the 'Tick if Zero' box was ticked. As illustration, for the before dataset, this would correspond to 5,891 'Private Car-owners' and 798 'Non Private Car-owners', with a further 109 cases where the 'Number of Private cars and vans' and 'Tick if Zero' were both missing. However, of the missing cases, 19 respondents were found to keep a 'Company' vehicle, i.e. the 'Number of Company cars and vans' kept overnight was one or more. In addition, of the 798 Non Private Car-owners, 106 also said they kept a Company car/van, and it was concluded that all these respondents had 'owned or had continuous use of a vehicle' according to Thornton et al.'s criteria. Therefore, the number of 'car-owners' under this combined Private and Company car/van criteria is 6,016, including 125 (or 106 + 19) respondents who owned a Company car/van but did not keep a Private vehicle or where this information was missing. The total number of respondents included in the segmentation analysis is therefore 6,708, which comprises 6,016 car-owners (90%) and 692 non-owners (10%), while a further 90 people gave no data for either Company or Private cars (all four associated data items were missing), and these people were excluded from the segmentation analysis for the before survey respondents (which is a larger dataset).

Note: it is not possible to discern from the data available whether any kept Company vehicle is also available for the respondent' private use or whether this usage was only available for work. For example, among the 10 people who said they kept a Company car/van and not a Private car/van (i.e. Number of Private cars/vans is zero), only one had said they were 'Self-employed', while 9 stated they were 'Doing paid work full-time', 'part-time' or had not specified their 'Current Situation'. (There were a further 96 respondents who said they kept a Company car/van and had ticked the 'Zero if Ticked' box for Private cars/van, but these were not analysed.) In addition, the permutations of 'Number of Private cars/vans', 'Number of Company cars/vans', 'Tick if Zero Private cars/vans' and 'Tick if Zero Company cars/vans' appeared to show inconsistencies, where one value contradicted another (e.g. 'Tick if Zero' was ticked, but the number was not zero) and/or they had one or more missing values among the four data items. While an attempt was made to clean up the Private car/van data inconsistencies in these cases, the Company car/van data was not scrutinised, apart from in cases where the respondent did not keep a Private car/van (n=125, versus n=852 overall).

The following provides a comparison of the questions used in the segmentation of car-owners between Thornton et al. (2011) [1] and the cohort survey, using the before survey dataset (which is larger than the after survey). The Thornton et al. approach used 10 questions (referenced by A. to J. below for convenience) to provide 6 car-owner segments, and a similar approach has been applied to the Carbon Case Study survey, although it should be noted there is not a one-to-one mapping between the two sets of questions/approaches.

2. Car-owners (n=6,016)

	Thornton et al. (2011) Criteria	Survey Criteria (shading indicates same criteria as non car-owners - see further below)
A.	**(B2 & B39) - Mobility / disability issues (combined from 2 questions)** 1=Respondent has no mobility or disability issues; 2=Respondent has a disability or long standing health problem that makes it difficult (but not impossible) to ride a bicycle but no problems going out on foot, or use local buses, or get in or out of a car; 3=Respondent has a disability or long standing health problem that makes it difficult to go out on foot, or use local buses, or get in or out of a car, or makes it impossible to ride a bicycle.	**28, 10, 12a, 13a - Health, disability and mobility issues (combined from 4 questions[1])** 1=Respondent has no long-term illness, health problem or disability which limits their daily activities or the work that they do, including any problems due to old age (Question 28 or 'Q28'=No); 2=Respondent has a long-term illness, health problem or disability (Q28=Yes), but they are able to walk continuously on level ground for at least five minutes (Q10=Yes[2]) and/or they are able to take a bus on their own, without help from others (Q12a=Yes[2]) and/or they are able to take a train on their own, without help from others (Q13a=Yes[2]); 3=Respondent has a long-term illness, health problem or disability (Q28=Yes), and find it difficult to walk on level ground (Q10=No[3]), and/or to take a bus (Q12a=No[3]) or train on their own (Q13a=No[3]); Missing = where no data was given for Q28 *or* where answer given for Q28, but no data given for Q10, 12a *and* 13a (n=322). Note: [1]There is also a question relating to whether respondents can cycle continuously on level ground for at least five minutes, but several cases have said 'no' due to comments such as 'I don't know how to ride a bike' or 'last rode years ago', rather than any value associated with Q28 (long-term illness), so this question is not used. [2]Where any *one* of the three mobility questions have been stated as 'Yes' *AND* none are specified as 'No'. [3]Where any *one* of the three mobility questions has been given as 'No'. Where the data given for Q10, 12a and/or 13a contradict Q28, the answer to Q28 is determinant. For example, if Q28 illness=No

		and Q13a Train = No, then rank=1. This is supported by exceptions found in the responses to the mobility questions, e.g. a 22-year old female who has no illness/disability issues has said she cannot take the train in Coalville without help, and this is probably due to the lack of a local rail station rather than any personal mobility issue, i.e. she required a lift from others.
B.	**F5(b) - Age of respondent** 1=16-20; 2=21-29; 3=30-39; 4=40-49; 5=50-59; 6=60-69; 7=70+.	**25 - Age**[5] 1=16-20; 2=21-29; 3=30-39; 4=40-49; 5=50-59; 6=60-69; 7=70+; Missing = where no data was given for Q25 (n=316). Note: [5]These are different age groupings to those used for the 'Travel Diary' data analysis.
C.	**F12 - Highest level of education from pre-coded list** 1=University first degree or above; 2=Diploma / A levels or equivalent; 3=GCSE A-C or equivalent; 4=GCSE D-E or equivalent; 5=No qualifications listed at question.	**31 - Highest education qualification** 1=Higher Degree, Degree, NVQ4, NVQ5 or equivalent (1^6); 2=BTEC (Higher), BEC (Higher), TEC (Higher), HNC, HND or equivalent (2^6); 2=GCSE 'A' Level, NVQ3, Scottish Higher or equivalent (3^6); 3=BTEC/BEC (National), TEC(National), ONC/OND or equivalent (4^6); 3=GCSE Grades A to C, GCE 'O' Level, CSE Grade 1, NVQ2 or equivalent (5^6); 4=Other qualifications[7] (6^6); 5=No formal qualifications (7^6); Missing = where no data was given for Q31 (n=259). Note: [6]This represents the answer as coded in the survey dataset. [7]This can sometimes be interpreted as a misnomer, as some respondents have included professional qualifications in this category. In some (but not all) of these cases, the respondent also holds another qualification, and the other (higher) qualification has been taken.
D.	**B5 - How many vehicles does your household own or have continuous use of at present?** 1=No car; 2=1 car; 3=2 cars; 4=3+ cars.	**5 - How many of the following vehicles are kept in your household? (Include all vehicles kept overnight)** **- Private cars and vans (Write in number)** **- Company cars and vans (Write in number)** The number of vehicles is calculated from the sum of these two numbers. 1=0 (n=0 by definition); 2=1 car; 3=2 cars; 4=3+ cars. No Missing data (as already excluded from segments dataset).
E.	**B17 - Whether Speed/performance is important when buying a car or van** 1=Yes; 0=No;	**6 - Speed/performance is important when buying a household car or van** 1=Yes, it is important (1^8); 0=No, it does not matter (2^8); Missing = where no data was given for Q6 speed/performance (n=152). Note: [8]This represents the answer as coded in the survey dataset.

F.	**Social - social grade** 6=A; 5=B; 4=C1; 3=C2; 2=D; 1=E.	**23a - Which of the following best describes the occupation of the Chief Wage Earner in your household?** 6=Professional[10]/Senior Managerial (1[9]); 5=Middle Managerial (2[9]); 4=Junior Managerial/Clerical/Supervisory (3[9]); 3=Skilled Manual (professional qualifications/served apprenticeship) (4[9]); 2=Unskilled Manual (no qualifications/not served an apprenticeship) (5[9]); 1=Full time student[11] (6[9]); 1=Retired[12] (7[9]); 1=Unemployed/Between Jobs[13] (8[9]); 1=Housewife/Househusband (9[9]); Missing = where no data was given for Q23a or = 'Other' (10[9]) (n=1,578). Examples of 'Other' where specified include 'Self-employed', 'Royal Navy', 'Education provider' and 'NHS' (this is a free text field). Self-employed includes e.g. 'IT Consultant' so cannot assume to be tradesmen In any case. Note: Chief Wage Earner may not be the respondent. [9]This represents the answer as coded in the survey dataset. [10]This appears to include all professionals, irrespective of seniority. [11]No distinction is made between those in higher education, and those undertaking vocational or other (e.g. English language) courses. [12]No data on occupation/social grade prior to retirement. [13]Includes those who are not unemployed.
G.	**A1 - Years lived in current home** 1=Up to 1 year; 2=More than 1, to 2 years; 3=More than 2, to 5 years; 4=More than 5, to 10 years; 5=More than 10, to 20 years; 6=More than 20.	**33 - How long have you lived in your current home?** (Years and Months[14]) 1=Less than 1 Year, i.e. Year = 0 or Year = Missing and Months >=0; 2=Year = 1 to 2 (irrespective of Months stated); 3=Year = 3 to 5 (irrespective of Months stated); 4=Year = 6 to 10 (irrespective of Months stated); 5=Year = 11 to 20 (irrespective of Months stated); 6=Year >= 21 (irrespective of Months stated); Missing = where both Year and Months are missing (n=183). Note: [14]Data has been cleaned so that Month cannot exceed 12. (Where Month exceeds 12, it is reduced by 12 and the Year is incremented by 1.) Where Month is given as 12 (n=3), it is assumed that this is slightly less than 12, i.e. no increment is added to Year.
H.	**B17 - Whether or not style/design is important to you when buying a car or van?** 1=Yes; 0=No.	**6 - Style/design is important when buying a household car or van** 1=Yes, it is important (1[15]); 0=No, it does not matter (2[15]); Missing = where no data was given for Q6 style/design (n=152). Note: [15]This represents the answer as coded in the survey dataset.
I.	**B42(4) - Agreement with: I would cycle (more) if there were more dedicated cycle paths** 1=Definitely disagree; 2=Tend to slightly; 3=Neither agree nor disagree;	**1i - To what extent do you agree/disagree with the following statement?** **- I would cycle more if there were more dedicated cycle paths** 1=Strongly disagree (-2[16]); 2=Somewhat disagree (-1[16]); 3=Neither agree nor disagree (0[16]);

	4=Tend to agree; 5=Definitely agree.	4=Somewhat agree (+1[16]); 5=Strongly agree (+2[16]); Missing = where no data was given for Q1i, or more than one answer was stated and it is not possible to discern the principle response (n=239). Note: [16]This represents the answer as coded in the survey dataset.
J.	**B19 - Miles personally driven per year** 1=0; 2=1-499; 3=500-999; 4=1,000-1,999; 5=2,000-2,999; 6=3,000-3,999; 7=4,000-4,999; 8=5,000-6,999; 9=7,000-8,999; 10=9,000-11,999; 11=12,000-14,999; 12=15,000-17,999; 13=18,000-20,999; 14=21,000-29,999; 15=30,000 or more.	**15b, 16b, 17b, 18b, 19b - How far did you travel in total over the last 7 days - By Car, as a driver** (in miles)**:** **- for work** (15b) **- in the course of business** (16b) **- for study/school** (17b) - **for shopping and personal business** (18b); and - **to visit friends/relatives or for other social activities** (19b)**.** The driving mileage over 7-days for each purpose is summed, and this total is multiplied by 52 (weeks) to derive the annual miles driven (product values are rounded to nearest mile). 1=0; 2=1-499; 3=500-999; 4=1,000-1,999; 5=2,000-2,999; 6=3,000-3,999; 7=4,000-4,999; 8=5,000-6,999; 9=7,000-8,999; 10=9,000-11,999; 11=12,000-14,999; 12=15,000-17,999; 13=18,000-20,999; 14=21,000-29,999; 15=30,000 or more; Missing = where no 7-day Travel Diary data given for *any* driving mileage (i.e. all purposes) (n=991). Note: The weekly mileage driven is as recorded in the Travel Diary sections of the cohort survey, and is unweighted. This includes a proportion of both journeys to/from work and travel in the course of business, as it is apparent (from random sampling) that some respondents are not able to differentiate between the mileage driven for work and those made in the course of business, e.g. because they are mobile workers, but do not work from home. This method of deriving the personal annual mileage is therefore likely to be an over-estimate, especially where the respondent has made long-distance journeys during the course of the survey week.

Note: Where data is 'Missing' for a given question, that criterion is ignored for the purposes for calculating the weightings used to determine the respondent's segment. This is true in the calculation of all 6 car-owning segment weightings, with the respondent being allocated to a segment if *one or more* of these questions are answered. Analysis shows that 96% of car-owners (n=5,793) have answered 8 or more of the mapped Golden Questions, and less than 0.2% (n=11) have answered 4 or less. (There are no car-owners who did not respond to any question.)

The following provides a comparison of the questions used in the segmentation of *non-car owners* between Thornton et al. (2011) [1] and the survey. The Thornton approach again uses 10 questions (referenced by K. to T. below) to provide the 3 non car-owning demographic segments, and a similar

approach is again used for the cohort survey, although there is not a direct one-to-one mapping between the two approaches.

3. Non-owners (n=692)

	Thornton et al. (2011) Criteria	Survey Criteria (shading indicates same criteria as for car-owners above)
K.	**F12 - Highest level of education from pre-coded list** 1=University first degree or above; 2=Diploma / A levels or equivalent; 3=GCSE A-C or equivalent; 4=GCSE D-E or equivalent; 5=No qualifications listed at question.	**31 - Highest education qualification** 1=Higher Degree, Degree, NVQ4, NVQ5 or equivalent (1[17]); 2=BTEC (Higher), BEC (Higher), TEC (Higher), HNC, HND or equivalent (2[17]); 2=GCSE 'A' Level, NVQ3, Scottish Higher or equivalent (3[17]); 3=BTEC/BEC (National), TEC(National), ONC/OND or equivalent (4[17]); 3=GCSE Grades A to C, GCE 'O' Level, CSE Grade 1, NVQ2 or equivalent (5[17]); 4=Other qualifications[18] (6[17]); 5=No formal qualifications (7[17]); Missing = where no data was given for Q31 (n=84). Note: [17]This represents the answer as coded in the survey dataset. [18]This can sometimes be interpreted as a misnomer, as some respondents have included professional qualifications in this category. In some (but not all) of these cases, the respondent also holds another qualification, and the other (higher) qualification has been taken.
L.	**(B2 & B39) - Mobility / disability issues (combined from 2 questions)** 1=Respondent has no mobility or disability issues; 2=Respondent has a disability or long standing health problem that makes it difficult (but not impossible) to ride a bicycle but no problems going out on foot, or use local buses, or get in or out of a car; 3=Respondent has a disability or long standing health problem that makes it difficult to go out on foot, or use local buses, or get in or out of a car, or makes it impossible to ride a bicycle.	**28, 10, 12a, 13a - Health, disability and mobility issues (combined from 4 questions[19])** 1=Respondent has no long-term illness, health problem or disability which limits their daily activities or the work that they do, including any problems due to old age ('Q28'=No); 2=Respondent has a long-term illness, health problem or disability (Q28=Yes), but they are able to walk continuously on level ground for at least five minutes (Q10=Yes[20]) and/or they are able to take a bus on their own, without help from others (Q12a=Yes[20]) and/or they are able to take a train on their own, without help from others (Q13a=Yes[20]); 3=Respondent has a long-term illness, health problem or disability (Q28=Yes), and find it difficult to walk on level ground (Q10=No[21]), and/or to take a bus (Q12a=No2[1]) or train on their own (Q13a=No[21]); Missing = where no data was given for Q28 *or* where answer given for Q28, but no data given for Q10, 12a *and* 13a (n=74). Note: [19]There is also a question relating to whether respondents can cycle continuously on level ground for at least five minutes, but several cases have said 'no' due to comments such as 'I don't know how to ride a bike' or 'last rode years ago', rather than any value associated with Q28 (long-term illness), so this question is not used. [20]Where any *one* of the three mobility questions have been stated as 'Yes' *AND* none are specified as 'No'. [21]Where any *one* of the three mobility questions has been given as 'No'. Where the data given for Q10, 12a and/or 13a contradict Q28, the answer to Q28 is determinant. For example, if Q28 illness=No and Q13a Train = No, then rank=1. This is supported by

		exceptions found in the responses to the mobility questions, e.g. a 22-year old female who has no illness/disability issues has said she cannot take the train in Coalville without help, and this is probably due to the lack of a local rail station rather than any personal mobility issue, i.e. she requires a lift from others.
M.	**Social - social grade** 6=A; 5=B; 4=C1; 3=C2; 2=D; 1=E,	**23a - Which of the following best describes the occupation of the Chief Wage Earner in your household?** 6=Professional[23]/Senior Managerial (1[22]); 5=Middle Managerial (2[22]); 4=Junior Managerial/Clerical/Supervisory (3[22]); 3=Skilled Manual (professional qualifications/served apprenticeship) (4[22]); 2=Unskilled Manual (no qualifications/not served an apprenticeship) (5[22]); 1=Full time student[24] (6[22]); 1=Retired[25] (7[22]); 1=Unemployed/Between Jobs[26] (8[22]); 1=Housewife/Househusband (9[22]); Missing = where no data was given for Q23a or = Other (10[22]) (n=279). Examples of 'Other' where specified include 'Self-employed', 'Royal Navy', 'Education provider' and 'NHS' (this is a free text field). Self-employed includes e.g. 'IT Consultant' so cannot assume to be tradesmen In any case. Note: Chief Wage Earner may not be the respondent. [22]This represents the answer as coded in the survey dataset. [23]This appears to include all professionals, irrespective of seniority. [24]No distinction is made between those in higher education, and those undertaking vocational or other (e.g. English language) courses. [25]No data on occupation/social grade prior to retirement. [26]Includes those who are not unemployed.
N.	**CN76 - Frequency of use of home delivery for non-food shopping** 1=Regularly; 2=Sometimes; 3=Once or twice; 4=Don't know; 5=Never.	**14b - How often, if at all, do you use home delivery (e.g. internet shopping/telephone ordering)? - For any non-food shopping, such as for buying books, CDs, clothes, holidays, or insurance** 1=Regularly (1[27]); 2=Sometimes (2[27]); 3=Have Only Done This Once or twice (3[27]); 4=Don't know (5[27]); 5=Never (4[27]); Missing=where no data was given for Q14b, or more than one answer was given and it is not possible to discern the principle response (n=15). Note: [27]This represents the answer as coded in the survey dataset. Note that 4 and 5 are coded the other way round in the survey.
O.	**(B47 & B50) Number of short-haul flights taken in last 12 months** 0=No flights; 1=1 flight; 2=2 flights; 3=3 flights or more.	**9b - How many flights did you make by plane during the last twelve (12) months? A return journey including at least one flight trip described below counts as one flight:** - Short-haul flights starting from the UK to Europe 0=No Flights (1[28]); 1=1 Flight (2[28]); 2=2 Flights (3[28]); 3=3 Flights or More (4[28]);

		Missing=where no data was given for Q9b, or more than one answer was stated and it is not possible to discern the principle response (n=63). Note: [28]This represents the answer as coded in the survey dataset.
P.	**B42(8) - Agreement with: I am willing to cycle on the roads (e.g. to work/school/the shops)** 1=Definitely disagree 2=Tend to slightly 3=Neither agree nor disagree 4=Tend to agree 5=Definitely agree	**1h - To what extent do you agree/disagree with the following statement?** **- I am willing to cycle on the roads (e.g. to work/school/the shops)** 1=Strongly disagree (-2[29]); 2=Somewhat disagree (-1[29]); 3=Neither agree nor disagree (0[29]); 4=Somewhat agree (+1[29]); 5=Strongly agree (+2[29]); Missing=where no data was given for Q1h, or more than one answer was stated and it is not possible to discern the principle response (n=103). Note: [29]This represents the answer as coded in the survey dataset.
Q.	**B46 - How safe are trains relative to other modes (in terms of risk of being a victim of crime)** 1= Least safe; 2=3rd most safe; 3=2nd most safe; 4=Most safe.	**4 - Thinking about personal safety, that is the risk of being a victim of crime, please rate trains in order of safety from the most safe to the least safe (compared to Bikes, Buses and Cars)** 1= Least safe (4[30]); 2=3rd most safe (3[30]); 3=2nd most safe (2[30]); 4=Most safe (1[30]); Missing=where no data was given for Q4(trains), or more than one answer was stated and it is not possible to discern the principle response (n=43). Note: [30]This represents the answer as coded in the survey dataset.
R.	**F15 - Which of these phrases comes closest to describing your feeling about your household income these days?** 1=Living comfortably on present income; 2=Coping on present income; 3=Finding it difficult on present income; 4=Finding it very difficult on present income.	**36 - What is your total household income from all sources before tax?** 1=More than £75,000 (7[31]); 1=£50,001 - £75,000 (6[31]); 2=£40,001 - £50,000 (5[31]); 2=£30,001 - £40,000 (4[31]); 3=£20,001 – £30,000 (3[31]); 3=£10,001 – £20,000 (2[31]); 4=Up to £10,000 (1[31]); Missing='Don't know' (8[31]), or where no data was given for Q36, or more than one answer was stated and it is not possible to discern the principle response (n=221). Note: It is recognise that these income mappings are approximate, as the perceived standard of living also depends on many other factors, including region/economic activity, marital status/number of children, etc. [31]This represents the answer as coded in the survey dataset.
S.	**F5(b) - Age of respondent** 1=16-20; 2=21-29; 3=30-39; 4=40-49; 5=50-59; 6=60-69;	**25 - Age**[32] 1=16-20; 2=21-29; 3=30-39; 4=40-49; 5=50-59; 6=60-69;

	7=70+.	7=70+; Missing = where no data was given for Q25 (n=67). Note: [32]These are different age groupings to those used for the 'Travel Diary' data analysis.
T.	**B31(1) - Agreement with: In general, I think that successful people tend to travel by car rather than by bus** 1=Definitely disagree 2=Tend to slightly 3=Neither agree nor disagree 4=Tend to agree 5=Definitely agree	**2k - To what extent do you agree/disagree with the following statement? - In general, I think that successful people tend to travel by car** **rather than by bus** 1=Strongly disagree (-2[33]); 2=Somewhat disagree (-1[33]); 3=Neither agree nor disagree (0[33]); 4=Somewhat agree (+1[33]); 5=Strongly agree (+2[33]); Missing=where no data was given for Q2k, or more than one answer was stated and it is not possible to discern the principle response (n=33). Note: [33]This represents the answer as coded in the survey dataset.

Note: Where data is 'Missing' for a given question, that criterion is ignored for the purposes for calculating the weightings used to determine the respondent's segment. This is true for the calculation of all 3 non car-owning segment weightings, with the respondent being allocated to a segment if *one or more* of the mapped questions are answered. Analysis shows 83% of the non car-owners (n=573) in the before dataset have answered 8 or more of the mapped questions, while less than 3% (n=19) have answered 4 or less. (One non car-owner did not respond to any question, therefore could not be mapped to a segment, and is ignored for the purpose of the segmentation analysis.)

4. Weighting Coefficients and Segment Allocation Algorithms

Segment membership for both car and non-car owners is determined using the same weightings and calculation algorithms as proposed by Thornton et al. (2011) [1]. The tables below show the weighting coefficients applied for car- and non-car-owners across the 9 segments (6 for car and 3 for non-car). Membership is then determined on a respondent-by-respondent basis using two 4-step algorithms (one for car-owner, the other for non-owner). The 4-steps are:

- i) The respondent's answer to each of the 10 mapped Golden Questions is multiplied by the relevant weighting coefficient - this is done for each of the segments or columns in the table;
- ii) The products for each question are summed, to generate a single total score for each respondent for each column in the table;
- iii) The relevant 'constant' is subtracted from each of the column totals;
- iv) The respondent is then allocated to the segment / column which they score highest against, once the constant has been subtracted.

Weighting Coefficients for Car-owners

Variable	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
A. Mobility/Disability	31.69499	10.90149	11.73576	12.2171	11.04677	11.1493
B. Age	4.76361	2.25679	4.43519	4.81527	3.04875	3.12341
C. Education	1.61234	2.4675	1.21981	2.82662	3.08955	2.49465
D. Number of vehs	6.84815	7.00689	7.17285	7.40678	7.67473	10.36731
E. Speed important	0.85221	0.60548	1.08672	1.52037	0.44677	5.04625
F. Social grade	2.57846	2.12591	2.0502	3.10691	3.10564	2.81858
G. Years in home	2.08327	1.19514	2.05797	2.3035	1.63197	1.67484
H. Style important	0.53561	0.43243	0.42176	0.29506	-0.02409	3.37571
I. cycle more	2.05982	1.6176	1.36296	1.75761	1.18885	1.5303
J. Personal mileage	0.29543	0.35912	0.44257	0.43462	0.58981	0.56081
Constant (subtracted from total)	-85.38568	-29.8349	-40.0442	-54.1945	-42.44767	-50.17753

Weighting Coefficients for Non car-owners

Variable	Segment 7	Segment 8	Segment 9
K. Education	1.17153	2.98486	1.64898
L. Mobility/Disability	3.60936	0.77332	1.27561
M. Social grade	2.07312	2.44424	1.47091
N. Non-food home delivery	2.68713	2.40626	3.10983
O. Short haul flights	0.63313	1.63136	0.56284
P. Cycle on roads	1.93977	1.17098	1.552
Q. Trains safe	2.16234	2.92211	2.2129
R. Income	3.25463	3.87662	5.12073
S. Age	3.51519	1.67595	1.36022
T. Car Bus Compare	2.94934	2.58275	2.89275
Constant (subtracted from total)	-40.99708	-31.35068	-30.34247

Reference:

[1] Thornton, A., Evans, L., Bunt, K., Simon, A., King, S. and Webster, T. (2011). Climate Change and Transport Choices: Segmentation Model - A framework for reducing CO2 emissions from personal travel. TNS-BMRB Report for the Department for Transport, London, July 2011.