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THEME: HOW CAN DEMAND MANAGEMENT BE ACHIEVED
WITHOUT FULL ROAD USER CHARGING?

**Making the case for active travel initiatives
as a travel demand management tool - Ways
forward given problems with evaluation**

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1 Introduction

Active travel initiatives - those encouraging walking and cycling - have the potential to yield widespread benefits such as increasing physical activity, reducing traffic congestion and lessening the impact of travel on the environment.

One reason for implementing such initiatives is specifically for the purpose of travel demand management. This refers to the use of different policies and techniques to achieve “*more efficient use of transportation resources*” (Victoria Transport Policy Institute 2014) by changing travel choices or the overall demand for travel. Hence, in the case of active travel schemes, the goal is to shift people from private car use to instead making journeys on foot or by bicycle. However, there are alternative travel demand management approaches that could be employed in preference of active travel schemes; road user charging being one. Therefore, there is competition for this stream of funding.

There is considerable weight behind the argument that provision should always be made to encourage active travel (as is the aim of the recent Active Travel (Wales) Act 2013 (Welsh Government 2013)), particularly in light of the potential health benefits from increased physical activity. However, in reality an authority, be it local or central government, has many responsibilities and funding is invariably going to be stretched.

It is also the case that transport funding has historically been focused on capital infrastructure schemes (Transport Committee 2011), whereas schemes not delivering infrastructure, such as demand management schemes, have been lower priority. Given this, providing strong evidence of the effectiveness of non-infrastructure active travel initiatives as a travel demand management measure would support funding in this area above the level that may otherwise be provided.

Unfortunately, assessing the impact of active travel initiatives and determining resultant ‘mode shift’ from the car to active modes is fraught with difficulties. Consequently, robust evidence with which to forecast the impact of future active travel interventions is not easily found. Wider literature reviews indicate data from active travel projects is heterogeneous (Ogilvie, Egan et al. 2004) and detail on data collection methods and assumptions made is often lacking (Davis 2014). Criticism has

also arisen on the reliability of the ‘go-to’ method of ‘before and after’ travel surveys, and the small sample sizes achieved meaning results are not valid to be generalised (Stopher, Clifford et al. 2009).

The decongestion and environmental benefits desired by travel demand management programmes only occur where a walking or cycling trip replaces a trip that would otherwise have been made by car, making it very important to detect the extent to which this shift occurs. Therefore, this paper considers *how we can better identify and validate the proposition that active travel schemes shift people from private vehicle use to walking and cycling*.

1.1 Scope of this paper

This paper focuses on demand-side active travel measures which attempt to change travel behaviour and do not necessarily rely on the provision of infrastructure, including:

- Cycle training
- Access to cycles
- Walking groups and led walks
- Personal Travel Planning (PTP)¹
- Active travel marketing
- ‘Beat the Street’-type initiatives²

These are initiatives that typically involve relatively small groups of people and can be expected to have quick results. Details of the individuals participating should be known to the project delivery team, and hence can be contacted after taking part. These types of interventions are often delivered as part of wider ‘smarter travel’ or ‘smarter choices’ investment programmes.

¹Residential Personal Travel Planning (PTP) generally involves trained travel advisors knocking door-to-door in a pre-defined target area, having a conversation about travel with a resident, and offers travel information and advice, and if desired by the resident, provides a pack of tailored travel information. PTP can also be undertaken at workplaces and schools.

²‘Beat-the-Street’ type initiatives are aimed at families with children. Participants are issued with smart cards that can be tapped against smart readers located in areas where walking and/or cycling are desired. Participants collect points each time they tap their card, and compete to gain the most points.

Table 1: Number of participants in active travel initiatives

	Number of adults taking up the following services to encourage cycling or walking in the period July 2011 to March 2014		
	Northumberland County Council	Redcar & Cleveland Borough Council	Reading Borough Council
Bike maintenance services or classes	230	474	622
Adult cycle training	50	0	20
Led walks	0	1041	0
Led cycle rides	0	179	57
Cycle loans	388	85	10

Source: LSTF Outputs Report 2013/2014 for Northumberland County Council, LSTF Outputs Report 2013/2014 for Redcar & Cleveland Borough Council, LSTF Outputs Report 2013/2014 for Reading Borough Council

An indication of the numbers of participants in such initiatives is shown in Table 1 for three randomly selected authorities receiving sustainable travel funding. Residential PTP routinely targets 10,000 households or more, however, in reality the number of residents receiving travel information can easily be less than a quarter of this due to non-participation or not answering the door.

1.2 Structure of this paper

This paper begins by highlighting the potential for active travel modes to be used instead of car.

This is followed by a discussion of obstacles in the evaluation process that have the biggest impact when attempting to quantitatively demonstrate effectiveness of active travel schemes in terms of shifting people from car to travel on foot or by bicycle. At present, literature discussing problems of the evaluation process is concentrated in academic journals and thus is quite restricted in its reach.

This is followed by a discussion of the evaluation of projects funded through the Department for Transport’s Local Sustainable Transport Fund. This illustrates the difficulties and shows where opportunities to demonstrate effectiveness of active travel initiatives may have been missed.

To conclude the paper, suggestions for the future are put forward for the purpose of improving the evaluation process and reporting of results from active travel behaviour change initiatives, and promoting their validity for future use within travel demand management investment programmes.

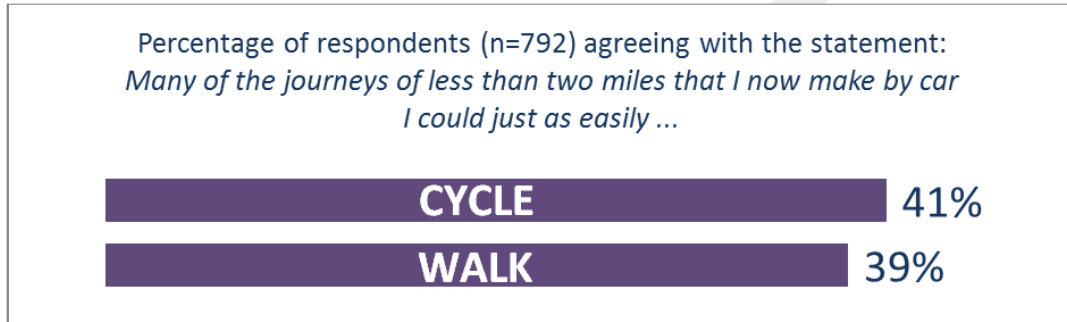
2 Potential to undertake active travel

The most recent National Travel Survey (NTS) shows that 58% of trips between one and two miles and 77% of trips between two and five miles are made by car (Department for Transport 2015a)³. Whilst accepting that there will be other factors constraining mode choice, including journey times, physical mobility, topography and weather, there is evidently potential to increase the proportion of trips by active travel modes. This is corroborated by the British Social Attitudes Survey where for journeys less than two miles currently made by car, 41% of respondents agreed or strongly agreed they could cycle these and 39% agreed or strongly agreed they could walk (Department for Transport 2015b).

It could be argued that active travel is not viable for longer distance journeys and therefore active travel initiatives are not always valid as a demand management tool. However, as a percentage of all trips, NTS data shows that 66% are less than five miles and 38% are less than two miles. Short distance trips (under 5 miles) therefore form the majority of trips, showing the value in encouraging active travel for short journeys. It is also the case that increasing the propensity for walking and cycling could lead to mode shift for longer journeys. For example, individuals may be more likely to use buses or trains for longer journeys if they can more

³National Travel Survey 2014 - Table NTS0308 - Trips by length and main mode

Figure 1: Potential to walk or cycle short trips



Data source: British Social Attitudes Survey 2014 - Table ATT0315 and Table ATT0317

easily walk or cycle to a bus stop or station.

Whilst this section has considered the possibility of directly replacing existing car trips with walking or cycling, one must also consider that interventions may lead to a wider reshuffle of an individual's travel behaviour. That is to say, a trip on foot or by bicycle may not be a like-for-like substitute of an existing trip by car. This is emphasised in the evaluation report of the Department for Transport's Sustainable Travel Towns travel behaviour change project which states: *"the picture is more complex than a simple mode shift of an unchanged trip pattern"* (Sloman, Cairns et al. 2010:252). This is important for the purposes of identifying mode shift, as it means all of an individual's travel over a given period of time needs to be assessed before and after an intervention, rather than looking at particular journeys.

3 Obstacles in the evaluation process

This section draws on published literature to highlight obstacles in the evaluation process that hinder robust evaluation of behaviour change schemes encouraging active travel. It is important to note that these types of interventions generally have relatively small budgets (between a few thousand to one hundred thousand pounds), with only a small proportion of that budget available for evaluation.

Concerns regarding evaluation methodology for voluntary travel behaviour initiatives have been raised in journal articles by Möser and Bam-

burg (2008)⁴, Stopher et al (2009) and Chatterjee (2009). There are several different issues described, but those of particular relevance to evaluating behaviour change initiatives encouraging active travel include:

- Obtaining complete travel records
- Detecting statistically significant change

3.1 Obtaining complete travel records and identifying mode shift

Obtaining complete travel records is pivotal to identifying where mode shift from car to active travel has taken place. Mode shift is recommended as an indicator of outcome performance and effectiveness in each of the evaluation guidance publications below that have been reviewed in the process of writing this paper. These are:

- Making Personal Travel Planning Work - Research (Parker, Harris et al. 2007)
- Making Personal Travel Planning Work - A Practitioners' Guide (Department for Transport 2008)
- Evaluation of Better Use Interventions: Evaluation Framework Report (AECOM 2009, for the Department for Transport)

⁴The systematic review which is notably used to derive mode shift percentages in the Department for Transport WebTAG (Transport Assessment Guidance) Unit M5-2 Modelling Smarter Choices

- Local Sustainable Transport Fund Monitoring and Evaluation Framework (Department for Transport 2012)
- Local Sustainable Transport Fund Monitoring and Evaluation Guidance (AECOM 2012, commissioned by PTEG)

Following on from the discussion in Section 2, to detect mode shift we ideally need to compare all of the trips made by a particular individual over a specified period of time, across all modes, before and after an intervention to allow comparison of the modal split percentages (the proportion of trips made by each mode of transport) before and after. For this reason methods that are typically used for monitoring walking (Department for Transport 2000) and cycling (Department for Transport 1999) including counters, piezoelectric mats, cordons and screenlines, and destination surveys, are not appropriate as they only identify overall volumes of travel in a specific area.

The common method for collecting data on all travel for an individual, as advocated in the guidance above, is through a travel diary where participants are asked to record their travel. However, there are issues with the reliability of self-reporting (discussed below) and this method can overburden participants leading to inaccurate reporting and non-completion. Furthermore, there can be significant costs involved in analysing resulting data. All these issues are a problem for evaluating active travel behaviour change initiatives given the small numbers of participants to follow up with and small evaluation budgets.

3.1.1 Problems with self-reported travel and prospects for future technology

The inaccuracy of self-reported travel data is evidenced by research experiments. The National Travel Survey have stated their problem with the recording of short walks (walks more than 50 yards and less than a mile), which they believe to have been historically under-reported in their surveys (Department for Transport 2014a). The NTS asks around 13,000 households annually to complete a seven day travel diary, but to reduce the burden on participants short walks are only reported on day seven. On conducting an experiment, the NTS found that short walks were under-reported when

collected on day seven instead of day one (Department for Transport 2014b).

Other recent research has compared self-reported travel diary data to video data from a wearable camera. The results at the group level showed validity, but at an individual level there was high random error (Kelly, Doherty et al. 2014). In addition, comparisons of GPS tracking to self-reported travel diary data showed under-reporting of trips (Anderson, Abeywardana et al. 2009).

For active travel behaviour change schemes with a small evaluation budget, self-reporting is the most feasible method to detect change in travel behaviour, but these findings suggest that self-reported travel behaviour should be regarded cautiously, particularly for small samples where any individual inaccuracy will have a greater effect on group level results.

GPS technology may be a solution given that it can automatically track movements, however, its use is not widespread. A pilot study using GPS devices to record travel was previously undertaken for the NTS in 2011 (Department for Transport 2011), but was not taken further. A lack of surety in the technology has been reported, and difficulties arose when analysing the resulting ‘big data’. There would also be a significant cost associated with such a system.

The possibilities for automatically recording travel may change with the increasing use of smartphones which are capable of collecting such data. Recent data shows that two-thirds of UK adults own such a device (Ofcom 2015). Smartphone apps that automatically record travel are being tested in countries abroad including in Singapore’s Future Mobility Survey and the Dutch Mobile Mobility Panel project (Geurs, Veenstra et al. 2013). These are supplemented by web-based platforms and there are certain limitations such as battery life of the phone and poor or interrupted signal, however, technology is continually improving so there are good prospects for this method.

3.1.2 Longevity of mode shift

An important issue that has not been mentioned thus far is the longevity of change in travel behaviour. There is a lack of evidence to say how long any change in travel behaviour will last following smarter choices initiatives (Mackett, Brown

2011). If behaviour change is not sustained indefinitely (as is likely the case), any figure of mode shift calculated will be a snapshot figure influenced by the length of time that has passed between participation in an initiative and a post-intervention survey.

3.2 Detecting statistically significant change

Assuming accurate changes in trip figures before and after an intervention can be elicited, it is necessary to test whether there is a statistically significant difference (i.e. the change seen is not due to random chance). This might be done using a paired t-test comparing travel of participants before and after. However, the smaller the number of participants, the harder it is to detect a given change as statistically significant, which is a problem for small active travel behaviour change initiatives. In addition, a small number of participants will reduce the generalisability of any results.

Furthermore, it is unlikely that all participants in an initiative will complete an after-survey. Achieving a sample size of respondents large enough to demonstrate change with a high level of confidence following a travel behaviour change intervention is an issue pointed out in the academic literature by several authors, including Bonsall (2009), Chatterjee (2009), Cohen (2009) and Stopher (2009). These authors make particular reference to vulnerabilities in evaluating PTP programmes.

Without broaching the technical statistical details⁵, in terms of sample sizes required, Richardson et al (2004) estimate that to detect a 10% change in car trips within a target community⁶ of 1500 households, based on gathering a single day of travel data, a sample of 547 is required. This reduces to 119 if data is collected over seven days, because variability in overall measurement is reduced. Richardson et al suggest that for measuring changes in walking and cycling, even greater sample sizes would be required, as there is more inherent variability in usage of these modes. It is not evident that results for PTP have been generated in-line with these estimates (as stated by Bonsall 2009: 308).

⁵See Richardson et al (2004) for in depth explanation

⁶It is assumed this refers to the number of participants

A related issue affecting reliability and wider applicability of results is bias. There are many potential sources of bias (see Richardson, Seethaler et al. 2004 for example) including after-survey respondents being unrepresentative of the wider population, or being the people more likely to have changed behaviour. Bias can potentially be corrected with weighting if characteristics that are over or under represented are known, however, a critical mass of respondents will still be required.

3.2.1 Ways forward

A potential solution to these issues is to increase the number of participants (demand permitting) and/or offer greater incentives to complete an after survey. However, this is unlikely to be viable for active travel behaviour change schemes given the associated increased costs in a constrained funding environment. Even if the numbers were large enough (as may be the case for some PTP programmes), the process of collecting and analysing complete travel records is disproportionately costly. This is emphasised by Cohen (2009) who, in reference to voluntary travel behaviour change schemes, states that a robust evaluation is prohibitively expensive.

That said, an automatic expectation that a programme will be evaluated and that the evaluation will produce quantitative results appears to exist (Cohen, 2009). Whilst there is a natural inclination to know how well something has worked, as the evidence in this paper suggests, robust quantitative results on an individual project basis are unlikely to be possible.

Statistical expertise is required to undertake analysis and know what is appropriate to report given the quality of data. This expertise may not be particularly accessible within a small project evaluation team. Thus, results lacking in robustness may be unwittingly reported or interpreted with a false sense of their validity. This is clearly undesirable.

Cohen (2009) suggests a more detailed qualitative evaluation should instead be considered with a focus on why behaviour change has (or has not) occurred. He states *“I would argue, a statistic of the sort ‘fifteen percent of those interviewed said that they were making fewer car trips since participating in the project’, however limited, may well be useful to the commissioners of PTP in*

persuading others in their organisations that a positive impact has been achieved." (page 346). This more limited descriptive approach avoids drawing generalised quantitative conclusions from a small sample of participants and self-reported travel data that is less reliable than ideally desired.

In a similar vein to the previously referenced authors, caveats to evaluating effectiveness can be found in the guidance publications. For example, in the DfT's 'Making Personal Travel Planning Work - A Practitioners' Guide' it states "*Large sample sizes and high survey response rates are required to produce reliable and valid results*" and "*To conduct such evaluations will .. place a significant financial burden on any one particular project and hence is unlikely to be appropriate for all future projects*" (Department for Transport 2008:73).

4 Example of the Local Sustainable Transport Fund

The Department for Transport's (DfT) Local Sustainable Transport Fund (LSTF) has been a significant source of funding for active travel projects since 2011 (and comes to an end in 2016). This capital and revenue funding enabled local authorities to identify locally appropriate solutions to their transport issues and bid for a share of the £560 million fund.

One of three principles underlying the LSTF evaluation framework (Department for Transport 2012) was that evaluation of a project should be proportional to its size. To reduce the burden on authorities, a "*light touch*" approach to evaluation was adopted and "*small*" LSTF projects (84 out of a total 96 projects receiving less than £5 million) were only obligated to report their **outputs** to the DfT - i.e. the volume delivered - rather than **outcomes** (how travel has been influenced as a result of the initiatives delivered). The twelve large projects were required to report both outputs and outcomes (Sloman, Cairns et al. 2015).

Reporting of outputs was standardised and this confirms that many projects were delivering similar initiatives. For active travel behaviour change initiatives total output activity up to March 2014 across 87 of the projects shows:

- 23,269 adults had learnt how to service their

own bike or had it serviced by a trained mechanic

- 14,544 adults undertook cycle training
- 6,192 had been loaned a bike
- 43,675 participants had taken part in led walks and cycle rides
- 293,682 people had been given personalised travel planning support

Source: *LSTF Annual Report 2013-14* (Department for Transport 2014c)

There was little standardisation for outcome reporting. As stated above, reporting on outcomes was not required for the small projects and for the large projects the DfT wanted project delivery teams to have "*the flexibility to collect monitoring and evaluation evidence in a way which reflects the local variation of projects*" (Department for Transport 2012: 5).

Yet evidently there are large numbers of participants taking part in similar initiatives who potentially could have been asked to take part in before and after surveys, and could therefore have provided substantial evidence as to the effectiveness of said initiatives.

Whilst it is acknowledged that there will have been some variation in the delivery of these initiatives between projects, it appears that an opportunity to gather evidence of effectiveness of active travel behaviour change initiatives has been missed - a system for collecting⁷ and amalgamating standardised outcome data could have been put in place, improving the chance of detecting statistically significant results.

Inevitably, many authorities running small projects did endeavour to evaluate outcomes to quantify the impact of their investment and identify policy measures that should be continued after LSTF funding finishes, but as is explained below this has been done in different ways and the robustness of results is likely to have been affected by the obstacles outlined in previous sections.

⁷It is noted that incentives may be needed to encourage high before and after survey completion rates

The guidance for evaluation, geared towards the twelve large projects, stopped short of any standardisation. The LSTF evaluation framework recommended the use of ‘local household surveys’ to monitor changes in walking and cycling, however, there is no further detail on this. The LSTF-specific evaluation guidance (AECOM 2012) recommended a household panel survey to provide data for a range of indicators, and suggests that this could include a detailed one day travel diary (Section 3.4.2). However, further on in the document, a seven day travel diary is recommended for monitoring changes in walking and cycling (Section 6.2.2). There is no template for either travel diary - for example, to specify whether all stages of a journey should be captured, or whether main mode of travel is sufficient.

Given the costs associated with a travel diary and the burden on respondents likely to lead to frequent non-response or non-completion, this is somewhat at odds with the stated light touch approach. Consequently, varying survey designs can be seen across publicly available project evaluation documents. Questions attempting to summarise travel patterns have been used in lieu of a travel diary, presumably attempting to avoid the drawbacks associated with a potentially more robust travel diary method. Examples of different question types from real LSTF projects are presented in Figures 2 to 4 at the end of this paper.

Answers to these questions would give a good indication of travel behaviour. However, a comparison with baseline survey data (as presumably was intended) is unlikely to yield definitive reliable mode shift figures. Each question refers to a different metric which could produce different results⁸, firstly due to the way respondents interpret the question and their ability to respond consistently, and secondly, where the grouping of trips leads some trips to be omitted (“days travelled on” rather than trips in Example Question A and in the grouped frequency response in Example Question C).

⁸Example Question A asks for “days travelled on”, Example Question B asks how often a journey was made, and Example Question C uses a grouped frequency response scale of ‘times’ travelled. Preliminary re-assessment of travel diary data suggests that if the same group of respondents were to complete the different questions based on the same seven day period, different mode shift figures would be produced.

The focus on easily defined journey purposes is recommended in the LSTF Monitoring and Evaluation Guidance (AECOM 2012). Whilst this provides a trigger to help respondents recall their travel, it could also lead to less easily defined journeys being left out, which is a problem for identifying mode shift across all travel. The benefit of a travel diary, at least, is that individuals only have to recall their actual travel, rather than recall, add up and summarise their travel.

Mode shift percentages achieved by individual LSTF projects in the early years of funding were quoted in many published bids for subsequent extension funding for 2015/2016, but these figures could each have been derived differently. Whilst doubtlessly reported in good faith, it can be seen that there may be cause for concern over the quality, standardisation and validity of results used in subsequent bidding for new funding.

Lack of standardisation is a theme of the recommendations put forward by researchers who conducted a meta-analysis of LSTF interim results from the 12 large projects (Sloman, Cairns et al. 2015). This included a recommendation to “*standardise attitudinal and travel surveys*” (page 209). It was also noted that the large LSTF projects took “*widely varied approaches*” (page 207) to their outcomes reports from the outset, and that in hindsight they really should have been better coordinated.

5 Conclusions and recommendations

This paper has demonstrated that many trips currently made by car are of a distance that could potentially be walked or cycled. Thus, it is reasonable to believe that initiatives encouraging active travel could be used as a demand management measure to reduce car trips. This paper has specifically considered the evaluation of active travel behaviour change interventions and how their effectiveness in generating mode shift is demonstrated. Nationally available evidence is focused on Personal Travel Planning or packages of measures and is considered relatively weak (Möser, Bamberg 2008). Furthermore, the guidance for evaluating effectiveness of travel behaviour change schemes is not appropriate

to the scale of individual active travel initiatives.

The process of detecting mode shift for active travel is fraught with difficulties. Even with the reported problems of self-completion, the most robust method of data collection (a travel diary) is prohibitively expensive, and alternative travel survey approaches seen in the LSTF example are unlikely to yield reliable mode shift figures. There are also problems with collecting enough participant data to generate statistically significant results with wider applicability. An opportunity to collect a high volume of standardised outcome data from LSTF funded interventions has been missed.

Ideally we need a substantively and statistically robust, yet cheap, method of identifying mode shift following interventions designed to increase active travel, and thus extracting the strongest possible evidence to support investment in active travel initiatives as a demand management measure.

Below, this paper makes recommendations to put into practice in the short-term and given the future prospects for using technology to monitor travel, also puts forward recommendations for the long-term. These recommendations are geared towards compiling evidence of effectiveness in a standardised way, with the ideal scenario being an online database that is accessible to those bidding for funding and making a case for active travel behaviour change projects.

5.1 Short-term recommendations

In the short-term, beginning immediately, this paper suggests that:

1. Guidance is developed which is focused on the practical processes that should be undertaken during evaluation of voluntary travel behaviour change projects designed to encourage active travel. This should detail standardised questions for use in a follow-up survey, recommend a suitable period of time between the intervention and the follow-up survey, and set standards for reporting. This would ideally be led by the DfT to encourage widespread use.
2. Such guidance should advise limiting statistical conclusions to high-level indicators where the number of after survey respondents is small. For example, “*four out of five adults*

now cycle more than they did before taking part in the course”, rather than results that have been derived through more complex statistical analysis.

3. Supporting data concerning the characteristics of the population and those participating should be collected. In line with previous research on factors affecting levels of walking and cycling, this should include as a minimum: age, average trip length/ distribution using either Census data or the National Travel Survey, and topography of the area. This could allow some assessment of the factors that contribute to an initiative being more or less successful. Additional guidelines for obtaining qualitative insight could also be given.

Questions proposed to generate the example result stated in Recommendation 2, are:

1. Do you cycle **more** since taking part in the programme?
2. Do you walk **more** since taking part in the programme?
3. Do you travel by car/private owned vehicle **less** since taking part in the programme?

These questions would be accompanied by tick box answers for Yes or No. It would also be desirable to add a free-text comment box, prompting respondents to describe *how often* and *what for*. This qualitative evidence should be considered important by funding decision makers.

If the budget is available (and this may have to come centrally from the Department for Transport rather than on an individual project basis), a standardised travel diary approach should be developed for participants to record their travel before and after participating in an initiative. Whilst this paper has pointed out the fallibility of self-reported travel behaviour, until the technology with reliable automatic recording is cost-effectively available, a self-completion travel diary is the best method.

The travel diary data would ideally be collated via a central system allowing results from identical interventions to be analysed together by a team with statistical expertise. Again, this would require the collection of supporting information concerning

demographics, trip characteristics in the area, and topography. The recording period and the length of time between participation and the after-survey would also have to be standardised.

At individual project level, evaluation teams should be advised to assess travel diary data in a qualitative manner, unless they have the budget, expertise and necessary number of participants to do otherwise (the guidance should offer examples of when this may be the case). The exact procedures used should have to be reported alongside any results.

5.2 Long-term recommendations

In the long-term, this paper would encourage the following actions:

1. Development of a smartphone application to automatically record a person's movements throughout the day, using GPS and other data. The participant would be required to activate the app before their first trip of the day and switch it off on arriving home (or at their final destination). This would be used before participation in an intervention and potentially at intervals after.
2. Development of analysis software to accompany the app, allowing the data collected to be processed into a useful format. Such software would use algorithms to deduce whether a person has walked, cycled or used motorised transport⁹.
3. A template for standardised reporting of outcomes that could be produced on a project specific basis.
4. A central storage point where data is amalgamated. This could potentially allow statistical analysis of mode shift based on data combined from various projects.
5. Development of a database storing statistical outcomes that can be used to forecast the outcomes of future interventions. This could be similar to TRICS, which is a national database used to forecast the number of car trips that will be generated by a new development, based on existing traffic survey data.

⁹A complex task!

5.3 Practicalities

These long term recommendations require substantial research and development. The key aspect - as far as evaluating effectiveness of active travel initiatives is concerned - is the ability to collect and combine standardised complete before-and-after travel data from sufficiently similar interventions, facilitating robust statistical analysis¹⁰. An app that automatically records travel is likely to be the best way forward, given the popularity and widespread use of smartphones. As described in Section 3, apps are being used in other countries and although there are some concerns this is an area constantly evolving.

There is a question about the provision of such an app and accompanying software and whether it would be funded privately or publically. If all evaluators of active travel behaviour change initiatives were encouraged to contribute before and after data (as would be desirable), then the app and accompanying analysis software would ideally be funded by the DfT/ central government, to avoid the undesirable situation where project teams (which may be external consultants) do not want to pay a (different) consultant to process their results. Alternatively, if the software was developed privately, project teams agreeing to contribute data could be given access to the output for free. However, there could be issues with the permanence of that private developer and for that reason, government control would be preferred.

It may also be questioned whether the funding required to develop an app and analysis software would be more than the potential benefit to be gained. However, considering that more than half a billion pounds was spent during the five-year life of the LSTF, the cost of developing an app and analysis software would amount to a tiny fraction of that. Furthermore, an app could potentially be used for other government travel projects, such as National Travel Survey data collection. The NTS has previously considered the prospect of using GPS and given the growth of technology, it may be time to consider a change again.

¹⁰It is noted that this could require some standardisation of inputs e.g. a certain level of achievement for a cycle training course. It is recommended that as much supplementary information as possible regarding inputs should be recorded.

Figure 2: Example Question A^a

Q5. During the last 7 days, on how many days did you travel to work (or education)? *(Please tick one answer below only. If you did not travel to work in the past week, tick 0 and move on to question 7. If you do not work, tick N/A and move on to question 7)*

<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> N/A
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Q6. During the last 7 days, on how many days did you make your journey to work (or education) by the following methods of transport? *(Please tick one response per line only and ensure the total number of days adds up to your answer in question 5. If you used more than one method of transport on one day then count only the method used for the main part, i.e. the greatest distance, of your journey)*

No. days	0	1	2	3	4	5	6	7
Walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car alone as driver	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car with other(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorcycle/moped	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taxi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Van	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

^aThe question is repeated for shopping and leisure.

Figure 3: Example Question B^b

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 spend time waiting for public transport please include this within the public transport journey time.

Section B – About Your Travel (Your Shopping and Personal Business Journeys)

Q1. 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)...

How often did you make such a journey over the last 7 days?

Q2. How much time in total over the last 7 days did you spend travelling for shopping and personal business by:

(Please provide your answers in minutes)

Walking	<input type="text"/>
Cycle	<input type="text"/>
Bus	<input type="text"/>
Train	<input type="text"/>
Car as a driver	<input type="text"/>
Car as a passenger	<input type="text"/>
Other	<input type="text"/>

Q3. How far did you travel in total over the last 7 days for **shopping and personal business** by:

(Please provide your answers in miles)

Walking	<input type="text"/>
Cycle	<input type="text"/>
Bus	<input type="text"/>
Train	<input type="text"/>
Car as a driver	<input type="text"/>
Car as a passenger	<input type="text"/>
Other	<input type="text"/>

Q4. Specify other mode if you used any.

^bThe question is repeated for commuting and leisure.

Figure 4: Example Question C

1a. How do you usually travel for each of the following purposes?

Please cross one box in each row for your MAIN MODE of transport for each journey purpose.

	Walking	Cycling	Train	Bus or coach	Car or van (alone)	Car or van (sharing with others)	Taxi or minicab	Motorcycle or moped	Other	I do not travel for this purpose
Work/ Education/ Training										
Taking children to school										
Accessing healthcare										
Main supermarket shopping										
Local shops and services										
Parks and leisure facilities										
Leisure trips to <i>specified facility</i>										

1b. If you said that you usually travel via an 'other' method for any of the journey purposes listed at 1a, can you please tell us what form(s) or transport?

--

2. How often, if at all, do you use the following transport modes to get about?

*Please cross **one** box in each row.*

	4 or more times a week	2 or 3 times a week	About once a week	About 2 or 3 times a month	About once a month	Less than once a month/ never
Walking						
Cycling						
Train						
Bus or coach						
Car or van (alone)						
Car or van (sharing with others)						
Taxi or minicab						
Motorcycle or moped						

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