**The impact of smarter choices on the use of active travel and public transport.**

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**ABSTRACT**

This paper examines the impact of the Local Sustainable Transport Fund (LSTF) and the Better Bus Area Fund (BBAF), with a particular focus on South Hampshire. In particular, it examines the impact on the extent of active travel (walking and cycling) and public transport usage. In so doing, the nudge hypothesis is critically examined. This hypothesis suggests that small changes in choice architecture can lead to large changes in behaviour. In the local transport context, this has meant an emphasis on improvements to information (such as real time information) and marketing (including personalised journey planning). This has often (but not always) coincided with physical improvements including the provision of interchanges, bus priority and cycleways. Before and after surveys are analysed to determine the impact on active travel and public transport. Results are compared with secondary data on road traffic, public transport and active travel usage. The extent of countervailing trends, such as changes in income levels and petrol prices, will be examined.

**1. Introduction**

There have been a number of trends in local transport policy in the UK in recent years. One is for funding to be increasingly awarded on a competitive basis. Another is for funding to be targeted towards ‘softer’ measures (also referred to as ‘smarter choices’ – Cairns et al., 2004) such as improvements in information and marketing rather than ‘harder’ measures such as infrastructure provision. Where infrastructure is to be provided the emphasis is on improvements for public transport, walking and cycling.

It might be suggested that Southampton, winner of the UK’s Transport City of the Year in 2013, has benefitted from these changes. It has been particularly successful in competitive bids.

1. It was awarded £3.96 million from the Local Sustainable Transport Fund (LSTF) (2012/13 to 2014/15), with a subsequent £1.0 million awarded for 2015/16, for the Southampton Sustainable Travel City project.
2. As part of Transport for South Hampshire[[1]](#footnote-1), it was awarded £5.75 million for the Better Connected South Hampshire project for the period 2012/13 to 2014/15.
3. Again as part of Transport for Hampshire, it shared in an award of £4.5 million from the Better Bus Area Fund (BBAF) for the period 2012/13 to 2013/14.

The aim of this paper is to provide a provisional evaluation of these interventions in terms of both process and impacts. In so doing, it will provide a critical examination of some of the theory underlying these interventions.

**2. Process Evaluation**

For the purpose of this paper, we define process evaluation in terms of whether the (largely) financial inputs and the (largely) physical outputs were achieved. The details of the financial inputs for the LSTF in Southampton are given in Table 1 – note these also include Local Authority contributions.

**Table 1: LSTF Funding Delivered by Southampton City Council (£ million)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Year** | **Source** | **Spend** | **Budget** | **Variance** |
| Revenue | 12/13 | SCC | 1.071 | 1.053 | 0.018 |
| 12/13 | TfSH | 0.464 | 0.418 | 0.046 |
| 13/14 | SCC | 1.170 | 1.152 | 0.018 |
| 13/14 | TfSH | 0.112 | 0.182 | -0.070 |
| 14/15 | SCC | 1.031 | 1.030 | 0.001 |
| 14/15 | TfSH | 1.064 | 1.011 | 0.053 |
| Total |  |  | 4.912 | 4.846 | 0.066 |
| Capital | 12/13 | SCC | 0.124 | 0.136 | -0.012 |
| 12/13 | TfSH | 0.758 | 0.610 | 0.147 |
| 13/14 | SCC | 1.041 | 1.320 | -0.278 |
| 13/14 | TfSH | 1.955 | 3.833 | -1.878 |
| 14/15 | SCC | 0.182 | 0.180 | 0.002 |
| 14/15 | TfSH | 3.499 | 3.503 | -0.004 |
| Total |  |  | 7.559 | 9.582 | -2.023 |
| TOTAL |  |  | 12.471 | 14.428 | -1.957 |

SCC = Southampton City Council, TfSH = Transport for South Hampshire.

Source: CSTC, 2015 and quarterly updates.

Table 1 indicates that there was a financial underspend of around £2 million or 14% of the budget. It can be seen that this mainly relates to capital expenditure related to the TfSH funding of smart ticketing. Southampton City Council led on the delivery of this output and the Solent Go Smartcard was launched in August 2014[[2]](#footnote-2). Although it could be argued that this underspend was due to efficient delivery, there is also an element of the product being de-scoped. Top-up facilities are only provided by the smaller bus operators, whilst the two major ferry operators and the local rail operators have yet to join the scheme. It seems that the major public transport operators in South Hampshire have been reluctant to participate and have developed rival branded products. The underspend on smart ticketing has been diverted to expenditure on physical interventions such as improvements to public transport interchanges and bus priority – but this aspect of the programme is not administered by Southampton City Council.

Table 2 shows the financial outcomes for the BBAF, with out-turn spend and the budget closely matched, albeit with a slight overspend on the revenue side and underspend in terms of capital. However, this was only achieved by permitting expenditure to extend into a third year (2014/15).

**Table 2 BBAF Spend (£ million)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Out-turn | Budget | Variance |
| Revenue | 0.789 | 0.766 | 0.023 |
| Capital | 3.981 | 4.011 | -0.030 |
| TOTAL | 4.770 | 4.777 | -0.007 |

To an extent the smarter choices agenda championed by the LSTF is difficult to quantify physically. Arguably the main output is the My Journey brand, which has been adopted by other Local Authorities, most notably Wokingham, and the associated website[[3]](#footnote-3). Around 200,000 people have visited the My Journey website throughout the duration of the programme, whilst awareness levels of the MyJourney brand have been recorded as 57% in Southampton, 45% in Portsmouth and 23% in the smaller towns of Hampshire. Having just one brand across these authorities has made it easier for people to engage with Solent

Transport and this may ultimately lead to a change in travel behaviour (Solent Transport, 2015b).

One of the main activities relates to personalised journey planning and the extent of these in the Greater Southampton[[4]](#footnote-4) area is shown by Table 3.

**Table 3: Personalised Journey Planning (PJP)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Date** | **Visits** | **Contacts** | **Follow-up** |
| Eastleigh | Summer 2013 | 4,733 | 2,030 | 610 |
| Millbrook | Spring 2013 | 3,845 | 1,807 (E) | 193 (E) |
| Portswood | Autumn 2013 | 3,300 | 1,584 (E) | 260 (E) |
| **TOTAL** |  | **11,878** | **5,421** | **1,063** |

Note: Eastleigh PJPs undertaken by consultants WSP, those for Millbrook and Portswood by Parose.

Overall, over 5,000 individuals were contacted (out of a target adult population of around 300,000) and of those over 1,000 were involved in follow-up surveys and related activities. Work in nearby Gosport indicated that these interventions typically lead to a 10% reduction in car driving per participant (see Sloman et al., 2015, p 207). It should be noted that the approach adopted is relatively light touch compared to some variants of this approach such as individualised travel planning (Brög et al, 2009), Travel Smart (Taniguchi and Fujii, 2007) or Travel Blending (Rose and Ampt, 2001).

The Southampton LSTF also has a strong focus on engagement with employers and with the community. Some data on the level of this engagement are presented in Tables 4 and 5, with much of this engagement being undertaken by the sustainable transport charity, Sustrans. Overall, there has been engagement with over 30,000 employees at almost 200 businesses, whilst some 15,000 have attended My Journey roadshows.

**Table 4: Workplace Programme in Southampton**

|  |  |  |
| --- | --- | --- |
|  | 2012/13 | 2013/14 |
| Large Employer | 7 | 7 |
| SME (Intensive) | 6 | 4 |
| SME (Light Touch) | 26 | 22 |
| Roadshows etc. | 21 | 39 |
| Active travel events | 21 | 38 |
| Walk Participants | 240 | 240 |
| Cycle Participants | 488 | 505 |
| Active travel info. | 550 | 331 |
| Active travel champions | 15 | 6 |

Note: Awaiting data for 2014/15

**Table 5: Community Programme in Southampton**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **2012/13** | **2013/14** | **2014/15** |
| Group engagements | 12 | 10 | 12 |
| Sure Start | 5 | 4 | 1 |
| Health walks etc. | 4 | 9 | 11 |
| Roadshows etc. | 34 | 39 | 53 |
| Active travel events | 63 | 209 | 106 |
| Walk Participants | 214 | 148 | 459 |
| Cycle Participants | 999+ | 1039 | 556 |
| Active travel info. | 845 | 1900 | 1448 |
| Active travel champions | 22 | 10 | 41 |

Other measures related to the LSTF included real time information at bus stops, improved wayfinding as part of the Legible City initiative, car sharing, a sustainable distribution centre and physical interventions which for Southampton focussed on improved interchanges (particularly at Southampton Central and Eastleigh) and improved cycling provision, including the Eastern Cycleway over the Itchen Bridge.

In some respect, the outputs from the BBAF are more tangible and hence more quantifiable. They are summarised by Table 6.

**Table 6: BBAF Outputs**

|  |  |  |
| --- | --- | --- |
|  | Out-turn | Plan |
| On Board WiFi  Next Stop Announcements  LED Lighting  Refurbishment  Apprenticeship | 571 buses  526 buses  549 buses  148 buses  90 apprentices | 500 buses  500 buses  500 buses  141 buses  16 apprentices |

Source: Solent Transport, 2015a.

This seems to suggest that the planned outputs were exceeded. However, two outputs of the BBAF were not delivered. The Smartphone App was not taken forward as it was felt that this role was provided by the My Journey web based planner, although the extent to which this is mobile friendly might be disputed and although cost information is given for car travel, it is not given for public transport. Similarly, NFC tags at bus stops were not delivered, despite a promising trial (Gammer, 2011), largely because an investment in real time information displays was made by the LSTF instead.

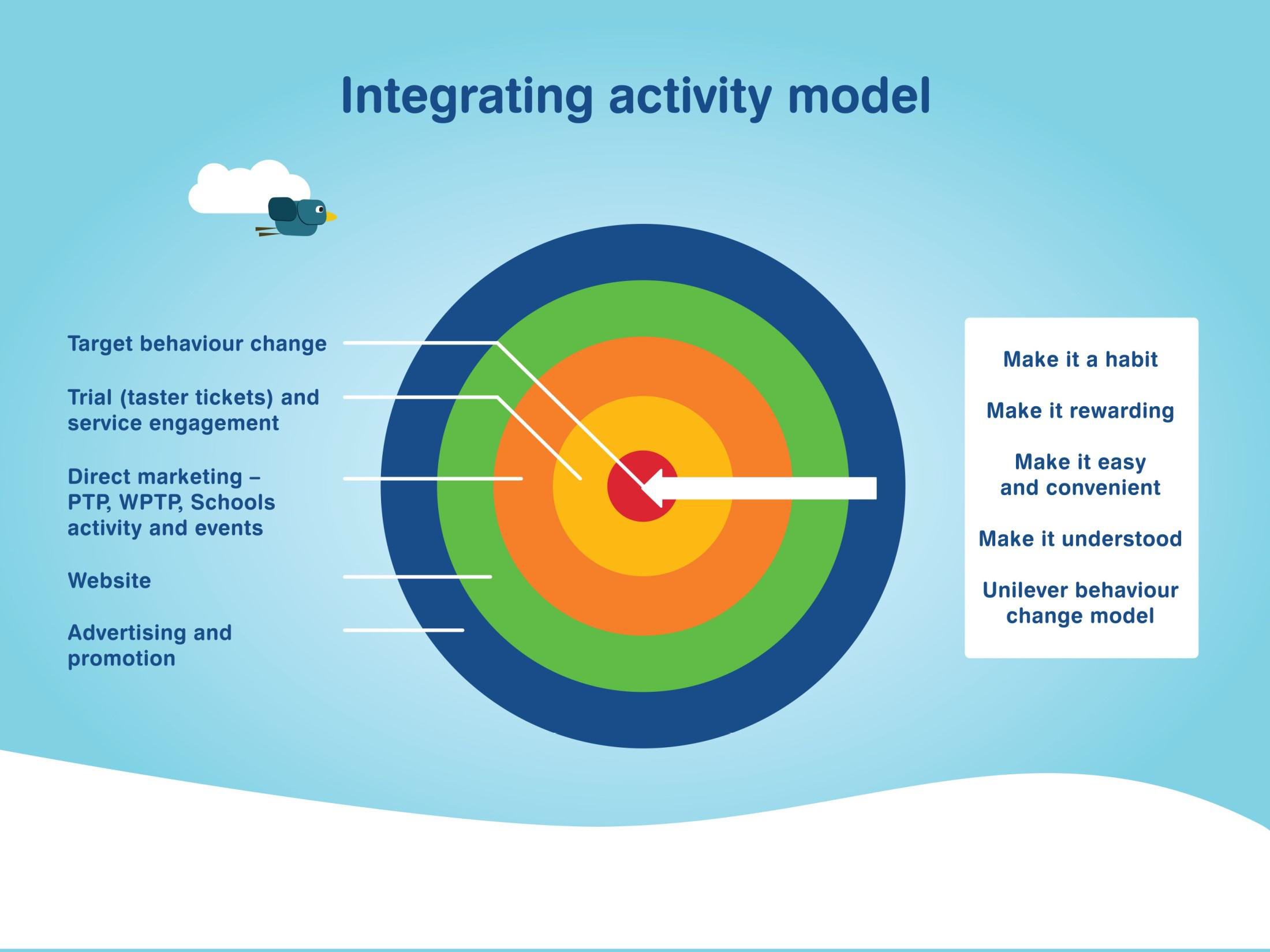
**3. Theoretical Underpinnings**

The conventional approach to evaluating transport policy looks at how changes in policy lead to changes in the transport system in terms of journey time and costs which in turn leads to changes in behaviour. Such an approach is underpinned by microeconomic theory in which consumers are rational utility maximisers. However, smarter choices do not fit neatly into this conceptual framework. Their impacts on the transport system in terms of journey times and costs are modest or, in some cases, absent. Far more important is how smarter choices affect attitudes, beliefs and perceptions and then in turn intentions and behaviours. Here the appropriate theoretical underpinnings are provided more by psychology and sociology than economics (see, for example, DfT, 2011, and Bamberg et al., 2011). This in turn has led to the development of behavioural economics - where psychology meets economics. This stresses the importance of bounded rationality, heuristics, loss aversion, herd mentality, network effects and misperceptions (e.g. excessive weight put on small probabilities). Popular concepts include the importance of messengers, priming and default choices and how small changes to, for example, choice architectures can nudge people into making big behavioural changes (Gladwell, 2000, Thaler and Sunstein, 2008). In essence, better information about active travel and public transport should lead to more sustainable travel choices.

In the field, more practical approaches are adopted. Logic mapping has become widespread, in the UK influenced by the Treasury’s Magenta Book (HMT, 2011). This emphasises 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 results, whilst impacts are the longer term results. This might in turn be seen to be influenced by the realist evaluation approach (see, for example, Pawson and Tilley, 1997) which sets up a framework to determine what policy interventions work, where, for whom and why. This approach places an emphasis on context, process (or mechanisms) and outcomes.

The approach adopted by Southampton City Council is illustrated by Figure 1 and is informed by consumer marketing models, such as those used by Unilever. It is strongly related to trans-theoretical stages of change model of Prochaska and DiClemente (1983). Advertising and other promotional activities are designed to raise awareness. The direct marketing helps increase contemplation, whilst trials encourage participation and, if those trials are successful, behaviour change. However, it is noticeable that the Southampton model does not have a maintenance stage and, as a result, the risk of relapse might be high.

**Figure 1: Approach adopted by Southampton City Council**



Note: PTP = Personalised Travel Plan, WPTP = Workplace Travel Plan.

**4. Impact Evaluation**

Although both schemes have multiple intended outcomes, for the purposes of this paper we will focus on one - modal shift. The LSTF programme had an objective of achieving a 12% modal shift away from private car use towards other forms of transport for travel to central Southampton. However, it was also assumed that private car use would grow modestly between 2010 and 2016 (by 1.5%) but this would be much less than overall travel growth (which was forecast at 27%). For BBAF, it was assumed that bus usage across Southampton would grow by 8%, leading a 5.6% increase in public transport mode share.

In evaluating the impacts of LSTF and BBAF we draw on two types of data: primary data we have collected ourselves and secondary data collected by governmental bodies.

4.1 Evidence from Primary Data Collection

For the LSTF we have three main data sources. Firstly, we have undertaken on-line surveys of participants at the My Journey roadshows and related events. This included an abridged seven day travel diary that had been tested for validity and reliability as part of the iConnect project (Adams et al., 2013). We refer to this as the exposure group and we have a total of 105 respondents to the surveys in 2013/14 and 64 in 2014/5. Secondly, we undertook a postal self-completion survey, that also included the seven day travel diary, for the Woolston ward of Southampton. This was an area that was relatively unaffected by LSTF interventions and we refer to this as our control group. There were 99 respondents to this survey in 2013/14 and 52 in 2014/5. Thirdly, telephone surveys have been undertaken by market research companies in 2011 (MRUK) and 2013 (ICM). This included a one day travel diary. Both have a sample size of 1,500 but the 2011 sample was stratified, with 100 respondents from each of 15 geo-demographic groups, whilst the 2013 sample was random. There are plans to repeat the telephone survey.

One of our key metrics is weekly travel distance. Some illustrative results for the control and exposure groups are given by Table 7.

**Table 7: Mean Weekly Distance Travelled per Survey Respondent 2014/15**

|  |  |  |
| --- | --- | --- |
| Travel distance (miles) | Exposure group | Control group |
| Walking | 4.83 | 5.00 |
| Cycling | 18.42 | 2.31 |
| Bus | 5.98 | 7.94 |
| Train | 23.21 | 17.06 |
| Drive | 59.73 | 99.01 |
| Passenger | 8.69 | 21.39 |
| Other | 7.45 | 0.04 |
| TOTAL | 128.31 | 152.75 |

It can be seen that there are differences in the overall level of weekly travel, with the exposure group travelling around 16% less. Furthermore, there are important differences in the modes used. In particular, the exposure group travels more by active travel, train and other, and less by car and bus. This is likely to be explained by the different socio-demographics of the two groups, in addition to exposure to LSTF measures.

The mode splits implied by this data are given by Table 8, whilst the changes in mode split are given by Table 9.

**Table 8: Mode Splits from Travel Surveys: 2014/15** (excluding other)

|  |  |  |
| --- | --- | --- |
| Distance share | Exposure group (%) | Control group (%) |
| Active Travel | 19.2 | 4.8 |
| Public Transport | 24.2 | 16.4 |
| Sustainable Travel | 43.4 | 21.2 |
| Car Driver | 49.4 | 64.8 |
| Car Passenger | 7.2 | 14.0 |
| All Car | 56.6 | 78.8 |

Table 9 reinforces the greater car dependency in the control group (accounting for 79% of travel) compared to the exposure group (57% of travel).

**Table 9: Changes in Mode Splits (%) from Travel Surveys: 2014/15 compared to 2013/14** (excluding other)

|  |  |  |
| --- | --- | --- |
| Distance share | Exposure group | Control group |
| Active Travel | +1.9 | +1.0 |
| Public Transport | +4.4 | -1.7 |
| Sustainable Travel | +6.3 | -0.8 |
| Car Driver | -5.6 | +6.5 |
| Car Passenger | -0.7 | -5.7 |
| All Car | -6.3 | +0.8 |

Table 9 shows that the share of active travel has increased in both the exposure group (by almost two percentage points) and the control group (by one percentage point). The use of public transport has increased in the exposure group (by over four percentage points) but has reduced in the control group (by almost two percentage points). The position with car travel is complicated by the seeming shift from car passenger to car driver in the control group. However, overall car use is down over six percentage points in the exposure group but up almost one percentage point in the control group. This suggests that the LSTF schemes are having some effect on travel patterns and the findings are consistent with recent work elsewhere, including recent work in Coalville (Leicestershire) (Parker et al., 2014). However, the small sample sizes mean that the results are not statistically significant.

Much larger sample sizes were achieved by the telephone surveys and some of the key results concerning mode choice are given by Table 10.

**Table 10: Mode Splits in Southampton from Telephone Surveys**

|  |  |  |
| --- | --- | --- |
|  | **2011** | **2013** |
| Car | 57.0 | 57.1 |
| Walk | 25.1 | 32.4 |
| Public Transport | 12.5 | 8.6 |
| Cycle | 5.4 | 2.9 |
| Trips per person per day | 2.1 | 3.0 |

Although, there has been no change in car use, there appears to have been increases in walking and decreases in the use of public transport and cycling and these differences are statistically significant. However, this is likely to be due to changes in sampling and data collection methodologies, given the large increase in the number of reported trips per day. Other data from the telephone surveys relates to frequency of mode use. This indicated that there were increases in the number of days per year that cycling and rail were used (albeit from low bases) and a strong decrease in the use of bus (Table 11).

**Table 11: Frequency of Mode Use in Southampton from Telephone Surveys (Days per Year)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **2011** | **2013** | **% change** |
| Bus  Rail  Car Driver  Car Passenger  Walk  Cycle | 66  11  155  90  208  27 | 57  17  174  88  213  33 | -14  +54  +12  -3  +2  +22 |

A card survey tool was deployed to monitor and evaluate changes in bus customer satisfaction related to the BBAF. In 2013, it was found that bus passengers preferred to complete survey cards than use the on-line survey tool that was also offered, with 232 survey cards completed through 4 survey days, as compared to 126 surveys completed online over a period of 12 months. In the repeat surveys in 2014, there were 582 completed survey cards, with 173 from Shirley (Southampton), 104 for Eastleigh, 167 from Fareham and 138 for Portsmouth. The key findings related to customer satisfaction and some details are given in Appendix A. Overall, there was a modest increase in overall satisfaction which was 64% in 2014 compared to 62% in 2013 (Song et al., 2014), with increases across all main attributes.

4.2 Evidence from Secondary Data Collation

**Table 12: Bus Passengers per Annum (millions)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 04/05 | 05/06 | 06/07 | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 |
| Southampton | 18.9 | 18.4 | 19.3 | 19.7 | 19.8 | 18.6\* | 18.0 | 18.2 | 17.8 | 18.0 |
| Portsmouth | 11.4 | 11.0 | 11.3 | 11.7 | 11.9 | 10.5 | 10.8 | 10.9 | 10.1 | 10.3 |
| Hampshire | 27.1 | 26.7 | 28.2 | 29.8 | 30.5 | 30.3 | 31.1 | 31.9 | 31.6 | 32.1 |

\*Difference between 08/09 and 09/10 in Southampton is due to the change of data collection methodology.

Table 12 indicates that to date the BBAF may have had modest effects on bus usage, with bus usage increasing by 1.1% in Southampton, by 2.0% in Portsmouth and by1.6% in South Hampshire between 2012/13 and 2013/14. However, route specific data show very strong variability with growth in East Southampton but declines in West Southampton (including Shirley), where there were numerous service changes, partly in response to competition.

More generally within Southampton and using 2010/11 as the base it can be seen that bus usage is constant up to 2013/14, whilst rail usage is up 10%. Between 2010 and 2013, car traffic on primary roads was down 6%, whilst on secondary roads it was 4%. Modelling based on economic performance and fuel prices would have expected a modest growth of 2%. Figure 2 shows that cordon counts around the City Centre have shown little change in mode splits since 2010.

**Figure 1: Southampton City Centre Mode Splits based on Cordon Counts**

School travel surveys in Southampton do suggest some model shift. For example, for primary schools between 2010/11 and 2012/13 car usage was down from 27% to 21%, whilst walk was up from 70% to 77%. For secondary schools over the same period, car use was down from 17% to 16%, whilst walk was up from 61% to 67%.

**5. Conclusions**

We can see that the LSTF and BBAF interventions have largely been delivered as planned, although somewhat backloaded. As a result, and given lags in data availability, it is premature to make a full assessment. However, we have some evidence that LSTF interventions might be reducing car driving by between 6% and 12% for exposed groups, depending on the treatment of the control. We estimate that around 25% of the Southampton LSTF adult population have been exposed to LSTF measures[[5]](#footnote-5). This would suggest reductions in car driving at the whole population level of around 1.5 to 3.0%. Although not inconsistent with car traffic reductions observed in Southampton (down between 4% and 8%, depending on the treatment of the control), these reductions are the bottom end of the work of others, in particular that of Sloman et al. (2010) on the Sustainable Travel Towns where traffic reductions of around 9 to 10% were found. It is also unlikely that the LSTF is responsible for all of the reduction of car travel – and other factors may be at play here, related to the concept of peak car (see, for example, Goodwin and Van Dender, 2013). There is also some evidence that the BBAF has coincided with a reverse in the decline in bus use, at least for a year.

Overall, the trends are in the planned direction. Active travel and public transport usage are up, but mainly due to increase in cycling and rail. Car use appears down. However, the changes are not of the forecast magnitude (in fact both car share for journeys to the city centre and bus use have remained broadly constant) and may be easily reversed. One target that does look like it will be met related to jobs. It was forecast that the LSTF would contribute to an extra 6,700 jobs between 2010 and 2016, particularly in the city centre. Between 2010 and 2013 the number of jobs in Southampton increased from 121,000 to 127,000, although the spatial location of these new jobs is not know.[[6]](#footnote-6)

Opportunities to achieve the desired scale of impacts may result from long-term dynamics, including the bottom-up development of sustainable travel, promoted by social media, and the creation of virtuous circles where higher levels of usage lead to both higher levels of investment and increases in the social acceptance of active travel and public transport use as the norm. However, there are possible threats. The changes to the National Planning Policy Framework and giving responsibility for major transport improvements to Local Enterprise Partnerships may unleash a new wave of top-down car dependent developments. The instability of the commercial bus network (due to competition) and the social bus network (due to Local Authority cut-backs) hampers the prospects for the bus market, whilst the cut-backs in funding are also limiting the abilities of Local Authorities to deliver (and monitor) even small interventions.

Our initial conclusion is that, somewhat contrary to the nudge hypothesis, the relatively small scale interventions in Southampton are only associated with relatively small changes in travel behaviour in the short run, albeit in the intended direction.

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Appendix A: Bus User Satisfaction



2013 results are from Hu, T.Q.T (2013) Monitoring and Evaluating the Better Connected South Hampshire and BBAF Projects. MSc Dissertation, Transportation Planning and Engineering, University of Southampton.

1. Now Solent Transport. [↑](#footnote-ref-1)
2. See <http://solentgo.co.uk/> [↑](#footnote-ref-2)
3. For example, see <http://myjourneysouthampton.com/>. A video highlighting the main programmes and activities of the Solent Transport LSTF may be found at : <https://www.youtube.com/watch?v=z3e_E9eeYXM> [↑](#footnote-ref-3)
4. Southampton had a population of around 237,000 in 2011. Greater Southampton includes Eastleigh, Hythe and Totton and has a population of around 417,000 whilst the South Hampshire conurbation (which also includes Portsmouth) has a population of over 1 million. [↑](#footnote-ref-4)
5. Assuming no double counting and all interventions affect Southampton residents, 30,000 affected by Workplace Travel Plans, 15,000 by Roadshows and almost 3,400 by Personalised Journey Plans. The population aged 17 plus is estimated at almost 195,000. [↑](#footnote-ref-5)
6. https://www.nomisweb.co.uk/reports/lmp/la/1946157287/subreports/jd\_time\_series/report.aspx? [↑](#footnote-ref-6)