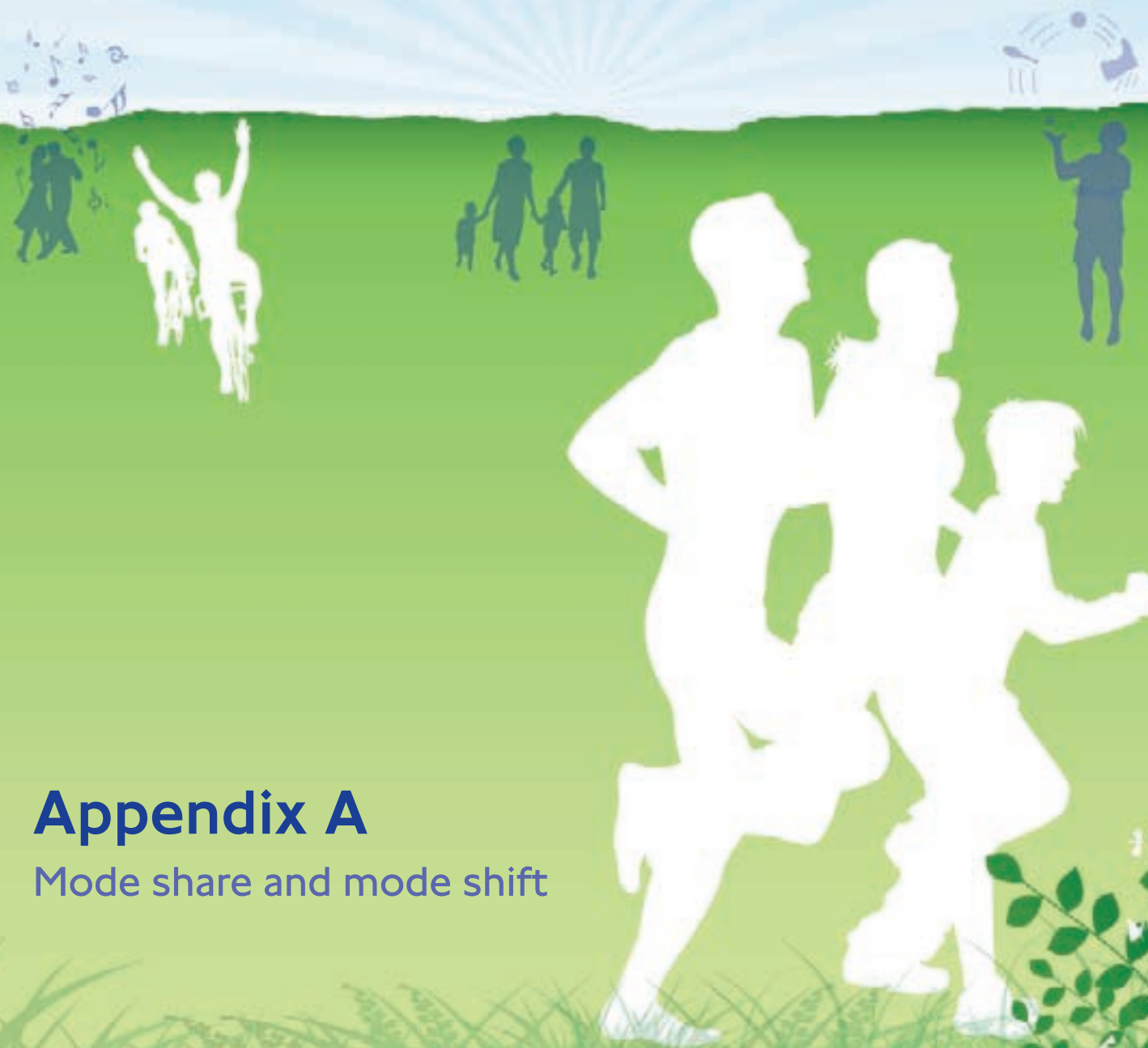


# Third **Annual** **Report** 2010



## Appendix A

Mode share and mode shift

## Introduction

Since 2006, the Smarter Travel Sutton (STS) programme has annually conducted approximately 1,500 personal interviews with a sample of residents of the London Borough of Sutton. The surveys collect information on residents' awareness of the STS, information on travel behaviour and attitudes to sustainable modes and car use.

Information on travel behaviour was used to derive a measure of mode share, an important indicator for the influence of the STS programme in changing travel behaviour, in particular, reducing car use and increasing use of walking and cycling. Doubts over the validity of the method for measuring mode share adopted for STS 2006 (baseline), 2007 and 2008 have persisted because of its approach.

The STS 2006–2008 surveys collected mode use information about journeys respondents made at least once per month for nine categories of purpose, and to locations they visited most often (for that purpose). For each purpose category, the trip frequency ie the number of times the trip for each purpose category (to the 'most often' location) was made per week, was also collected. This was then used to weight the mode use information corresponding to the same purpose to derive the volume of trips per week by each mode, from which mode share percentages could be derived.

The main concern was that this method was different to that used by TfL in publishing residents' mode share in the Travel in London report. To derive these results, TfL uses the London Travel Demand Survey (LTDS) which uses a one day travel diary to collect information about all trips for the day prior to the interview day.

To achieve consistency with LTDS, it was agreed that for STS 2009, a one day travel diary survey design compatible with LTDS, and very similar to that deployed in the Smarter Travel Richmond upon Thames (STR) 2008 survey, would be adopted. A change like this meant that it would not be possible to distinguish real changes in mode share from those due to changes to the survey design, using STS 2009 and the baseline STS 2006 results. However, adopting an LTDS travel diary design meant there was an opportunity to use LTDS survey data (starting from 2005/06 survey (fiscal) year) as a baseline.

## 2 Mode share

The following table presents the full series of mode share results for the STS programme. The method for calculating mode share is the same used for preparing residents' mode share results for TfL's Travel in London report: percentage share of trip-stages, but with the number of walk trip-stages replaced by the number of walk 'all-the-way' (walk ATW) trips. The pre-2009 STS results are as reported. It was not possible to re-analyse the data to determine how the analysis of the number of walk ATW trips was carried out.

Mode	Survey year (source)			
	2006 (STS - baseline)	2007 (STS)	2008 (STS)	2009 (STS)
Rail	13%	14%	15%	7%
Underground	3%	4%	4%	4%
DLR	Not reported	Not reported	Not reported	0%
Tram	Not reported	Not reported	Not reported	0%
Bus	11%	12%	15%	11%
Car driver	59%	56%	52%	44%
Car passenger				8%
Cycle	2%	1%	2%	2.1%
Walk	9%	9%	10%	22%
Other	Not reported	Not reported	Not reported	2%
All modes	97%	96%	98%	100%
Number of trips	Not reported	Not reported	Not reported	4,387

As expected, there are some significant differences. The largest differences between STS 2009 and earlier years' results are seen in the share of rail trip-stages and share of walks. Compared to a number of different methods for collecting mode use information and deriving mode share estimates, the pre-2009 STS results for rail and walk are very high and very low respectively.

The scale of these differences rules out the possibility of using the pre-2009 STS data as a baseline and time-series for identifying the change and trends in mode share in relation to 2009.

Next, the STS 2009 results were compared against the LTDS series of weighted mode share results for residents of the London Borough of Sutton. The LTDS analysis was restricted to residents aged 18 or more. The method of mode share calculation for LTDS and STS are identical.

Mode	Survey year (source)				
	2005/06 (LTDS) %	2006/07 (LTDS) %	2007/08 (LTDS) %	2008/09 (LTDS) %	2009 (STS) %
Rail	6	8	6	8	7
Underground	5	7	4	5	4
DLR	0	0	0	0	0
Tram	0	1	0	1	0
Bus	10	10	12	12	11
Car driver	46	44	49	41	44
Car passenger	12	10	11	9	8
Cycle	0.6	0.4	0.9	0.1	2.1
Walk	19	18	16	23	22
Other	1	3	2	1	2
All modes	100	100	100	100	100
Number of trips	470,880	452,276	311,515	443,276	4,387

Mode	Survey year (source)		
	2005/06 (STS - baseline) %	2009 (STS) %	Change %
Rail	6	7	0.9
Underground	5	4	-0.5
DLR	0	0	0.1
Tram	0	0	0.1
Bus	10	11	1.3
Car driver	46	44	-2.2
Car passenger	12	8	-4.4
Cycle	0.6	2.1	1.5
Walk	19	22	2.7
Other	1	2	0.5
All modes	100	100	
Number of trips	470,880	4,387	

The LTDS and STS results compare well, as would be expected from compatible survey designs. The LTDS results on their own show a small number of relatively large changes from one year to the next. This is likely to be a reflection of the relatively small sample size of approximately 400 people (200 households) upon which annual LTDS results are based.

For the purposes of assessing mode share of STS 2009 against previous survey years, comparisons between LTDS 2005/06 and STS 2009 have been made to establish a measure in the overall change between the baseline year, prior to the implementation of STS initiatives in 2006, and the final year of the programme.

### 3 Mode shift

Mode share is an aggregate indicator of mode shift: an increase in the mode shares of walking and cycling and a decrease in the mode share of car is often interpreted as mode shift from car to walking or cycling. However, the subject of mode shift is often more complex than a basic assessment of mode share. For instance, a change in mode share may imply mode shift or it could be simply a consequence of the types of trips being made. This change may be due to external factors such as employment rather than by choices made by residents to use alternative modes.

This consideration leads to the question 'what is mode shift'? A rigid definition of mode shift would be a 'change in modes used to conduct the same trip', where same is taken to mean the same purpose and same

destination. A less rigid definition would be 'changes in aggregate volumes of modal stages'. The key difference is that mode share is a relative measure, so a rise in the use of a particular mode increases its overall share and necessarily leads to a reduction in the share of other modes. However, changes in volumes of modal stages can be analysed independently from other modes.

In addition to the above, mode shift has been analysed based on stage rates (number of stages divided by the number of people). The following table summarises the stage rates for LTDS 2005/06 and STS 2009 and measures of changes in stage rates.

The main difference between the two years is a reduction in the overall the stage rate from 3.43 in 2005/06 to 2.86 in 2009: a reduction of 0.57 stages per person per day, or 17 per cent. This is a large change and could be attributed to a number of factors besides the potential that it is a real change. These include; sample variation (especially LTDS), season variation between LTDS travel diaries (cover whole [in practise, 'most'] of the year) and, STS (covering September to October).

The increase in individual modal stage rates, expressed as a percentage are given in the column headed 'Modal change'. These show a very large, nearly two-fold increase in the cycle rates (186 per cent) and a 59 per cent increase in tram use which account for a very small proportion of travel and large reductions in Underground (minus 25 per cent), car driver (minus 21 per cent) and car passenger (minus 47 per cent) which collectively account for the majority of travel.

Expressing the difference in stage rates (column headed 'Difference') as a percentage of the 'All modes' baseline stage rate figure of 3.43 provides a breakdown of how the 17 per cent reduction is accounted for across each mode. The near three-fold increase in cycling accounts for a one per cent increase in the overall stage rate. However, this increase is countered by large reductions in car driver and car passenger, accounting for minus 10 per cent and minus six per cent respectively of the overall reduction and smaller reductions in Underground and walking stage rates each accounting for minus one per cent reductions.

Given the uncertainty with the size of the reduction in the overall stage rates, hence individual modal stage rates, the same assessment can be made using adjusted STS 2009 stage rates that assume no change in the 'All modes' stage rate. The following table illustrates the effect of doing so.

Mode	Survey year (source)				
	2005/06 (LTDS) %	2009 (STS) %	Difference %	Modal change %	Overall %
Rail	0.20	0.19	-0.01	-4	0
Underground	0.16	0.12	-0.04	-25	-1
DLR	0.00	0.00	0.00	0	0
Tram	0.00	0.01	0.00	59	0
Bus	0.33	0.31	-0.02	-5	0
Car driver	1.59	1.26	-0.33	-21	-10
Car passenger	0.41	0.22	-0.19	-47	-6
Cycle	0.02	0.06	0.04	186	1
Walk	0.66	0.63	-0.03	-5	-1
Other	0.05	0.05	0.01	13	0
All modes	3.43	2.86	-0.57	-17	-17

Mode	Survey year (source)				
	2005/06 (LTDS) %	2009 (STS) (adjusted) %	Difference (adjusted) %	Modal change (adjusted) %	Overall change (adjustd)%
Rail	0.20	0.23	0.03	15	1
Underground	0.16	0.15	-0.02	-10	0
DLR	0.00	0.00	0.00	0	0
Tram	0.00	0.01	0.00	90	0
Bus	0.33	0.37	0.05	14	1
Car driver	1.59	1.51	-0.08	-5	-2
Car passenger	0.41	0.26	-0.15	-36	-4
Cycle	0.02	0.07	0.05	243	2
Walk	0.66	0.76	0.09	14	3
Other	0.05	0.06	0.02	35	0
All modes	3.43	3.43	0.00	0	0

## 4 Conclusions

The effect of adjusting the STS 2009 result to get the same 'All modes' stage rate for LTDS, mean the results for 'Overall change' now exactly match those derived from the mode share results in the 'Change' column. In fact the LTDS 2005/06 and STS 2009 stage rates are the same as the relative mode share measures but on a different scale, so both the modal change and overall change calculations performed on the mode share results would reproduce the results equivalent in the above table.

The analysis of stage rates provides a measure of the scale of changes. The results of the unadjusted stage rates suggest a very large reduction in car stage rates which accounts for nearly all the reduction in the 'All modes' stage rate. This implies the large change in car use has not led to a correspondingly large change in the use of other modes. This also suggests that there hasn't been a mode shift from car to walk or cycling, but rather just a reduction in car use.

The adjusted results suggest that most of the reduction in car use (minus six per cent) has been taken up by increases of two per cent and three per cent in cycling and walking respectively: a large mode shift from car to active modes.

The introduction of the 'LTDS compatible' one day travel diary in the travel behaviour section of the STS 2009 questionnaire has produced mode share results which compare well with equivalent LTDS results. The change means it was not possible to use pre-2009 STS mode share estimates as the basis upon which to make comparisons with STS 2009. LTDS 2005/06 was identified as the only complete LTDS survey year which can provide a baseline (ie prior to commencing the implementation of STS initiatives).

Comparisons between the LTDS (2005/06) baseline data and STS 2009 show more than six per cent reduction in the mode share of car (driver and passenger), approximately one per cent increases in mode share of rail and buses, and increases in cycling and walking of 1.5 per cent and 2.7 per cent respectively.

Analysis of aggregate levels of stage rates for individual modes provides evidence of a reduction in the overall stage rates of 17 per cent. However, sample and seasonal variations in LTDS results require a cautious approach in reporting of these results. Both mode share and stage rate measures suggest there has been a change in the intensity of use of modes that indicates car use has reduced and walking and cycling has increased between the 2005/06 and 2009 period.

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