

Bike It Review 2010

Technical report on data collection and analysis

May 2010

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1 Introduction

The following technical report outlines the mechanisms used for data collection, collation and analysis for the Bike It programme. This document refers to the data collected in the academic year 2008-2009.

1.1 Data collection and analysis

There were three key data collection methods used by Bike It officers in the monitoring of the programme for the 2008-2009 academic year; hands-up surveys, activity logs and counts of parked bikes. Further monitoring in the form of a Head Teacher and School Champion Survey and a survey of Local Authorities was administered by the Research and Monitoring Unit. The Research and Monitoring Unit were responsible for the collation and analysis of all data collected.

1.1.1 Hands-up surveys

The hands-up survey is used to measure the impact of the Bike It project. The hands-up survey allows data to be collected from a large number of pupils where it is not practical to conduct surveys at the individual pupil level. The surveys are typically administered by the Bike It Officer, although in some cases teachers or School Champions administer the survey in their absence.

The pre-intervention hands-up survey is carried out as soon as possible when the Bike It Officer begins to work at a school, typically in September. Essentially, this is prior to any active role in the school. The follow-up or post survey is conducted at the end of the summer term. Guidance for the delivery of the survey is also provided.

The pre and hands-up survey asks five questions:

1) Do you cycle to school?

The response options for this question are: Never, Everyday, Once or twice per week, Once or twice per term, Once or twice a year

2) Do you walk to school?

The response options for this question are: Never, Everyday, Once or twice per week, Once or twice per term, Once or twice a year

3) Do you come to school by car?

The response options for this question are: Never, Everyday, Once or twice per week, Once or twice per term, Once or twice a year

4) How did you travel to school today?

The response options for this question are: Car, Walk, Bus, Cycle, Train, Other

5) How would you most like/prefer to travel to school?

The response options for this question are: Car, Walk, Bus, Cycle, Train, Other

In London, the funding for the Bike It programme requires a fourth question: Is there a bicycle at home that you can regularly use? The response options for this question are: Yes, I own a bicycle; Yes, I can borrow a bicycle; No.

Further details recorded in the survey are: survey date, school name, class and year group, name of the Bike It officer, number of pupils present for the survey, number of pupils absent and whether the survey is pre or post intervention.

The data presented in the Bike It review relate to Bike It Officers working on projects in England, London, and Wales. The figures are reported separately due to funding variations and as a result of geographical considerations. London and Wales are not included in the overall change figures presented in the Bike It Review.

The total numbers of schools included in the overall England analysis are presented in Table 1 in the Appendix. The number of responses to each question is also shown. This exercise has been repeated with reference to the data collected in London and Wales which are reported separately (see Table 2 and Table 3 in the Appendix).

Once the survey has been completed, the Bike It officer enters the data into a web based monitoring database. The data is checked for quality and analysed using Excel to generate frequencies for each question, for each school. The data is provided at the individual school level and aggregated by Bike It officer area, providing figures for these categories pre- and post-intervention. The data is aggregated across the whole programme (separately for London and Wales) to give overall figures for Bike It, pre- and post-intervention. The following section provides an in-depth explanation of the analysis used.

1.1.2 Hands-up Surveys - data analysis

In each Bike It school two main surveys take place one before and one after the intervention.

We call m the number of students present at the pre hands-up survey at time t_{pre} and n the number of students present at the post hands-up survey at time t_{post} . Please note that neither m nor n have to correspond to the number of pupils at the school or year groups in question, nor do they have to be equal (administration of the survey through hands-up at a given day mean any number of pupils can be missing). The time points t_{pre} and t_{post} are different for every Bike It school. We have questions $i = 1, 2, 3, \dots$ and in each of the questions we have a number of responses options $j = 1, 2, 3, \dots$ we get the following notation for the numbers of pupils answering to the responses. The example shown is for the question 'Do you cycle to school?'

Response options for the pre survey are: m_1^1 for Never, m_2^1 for Everyday, m_3^1 for Once or twice per week, m_4^1 for Once or twice per term, m_5^1 for Once or twice a year. Responses for the post survey are noted correspondingly with n_j^1 for $j = 1, 2, 3, 4, 5$

The sum of the responses to the three questions is neither equal across the questions nor is it equal for the pre and post survey.

For questions $i = 1, 2, 3, \dots$

$$\sum_{j=1}^5 n_j^1 \neq \sum_{j=1}^6 n_j^2 \neq \sum_{j=1}^6 n_j^3 \quad \text{and} \quad \sum_{j=1}^5 m_j^1 \neq \sum_{j=1}^6 m_j^2 \neq \sum_{j=1}^6 m_j^3$$

$$\text{as well as} \quad \sum_{j=1}^{j_i} n_j^i \neq \sum_{j=1}^j m_j^i .$$

The results of the hands-up survey are usually given in frequency tables, comparing the frequencies of responses given pre project to those given post. For Question 1, this looks as follows:

Table 4: Example of frequencies for Question 1 of hands-up survey

	Pre t_{pre}	Post t_{post}
Never	$\frac{m_1^1}{m} = p_1^1$	$\frac{n_1^1}{n} = q_1^1$
Everyday	$\frac{m_2^1}{m} = p_2^1$	$\frac{n_2^1}{n} = q_2^1$
Once or twice a week	$\frac{m_3^1}{m} = p_3^1$	$\frac{n_3^1}{n} = q_3^1$
Once or twice a term	$\frac{m_4^1}{m} = p_4^1$	$\frac{n_4^1}{n} = q_4^1$
Once or twice a year	$\frac{m_5^1}{m} = p_5^1$	$\frac{n_5^1}{n} = q_5^1$

1.1.3 Hands-up survey - limitations

Sustrans consider the hands-up survey used in the Bike It project to be unique. Not only is the survey used to detect changes in behaviour pre and post project delivery, the survey captures the responses of thousands of children from individual schools across a number of Local Authority areas. The format that the survey takes allows for analysis at the school and Local Authority level, alongside analysis to explore the impact of the project overall.

It is possible to compare the proportions to each response category for each question through simply stating the frequencies or percentages. However, the results are subject to much variation. Sustrans cannot currently draw conclusions on where cycling trips in the Bike It programme are gained (i.e. from sustainable or unsustainable modes) and the changes taking place between other modes as the surveys are not paired. For example, we do not know whether a group of students that was previously driven to school have now cycled or whether a high proportion of cycling in the post survey is just due to a particularly nice weather day.

A further limitation is the timing of the survey: time of year that surveys are conducted and the level of contact that the Bike It Officer has had with the school may have implications on the responses gained. The pre-Bike It survey is typically conducted in September by the Bike It Officer, School Champion or a teacher at the school. If conducted by the Bike It Officer, the survey will be conducted as soon as possible. It may be the case that the Bike It Officer has already had contact with the school and pupils on a number of occasions before the opportunity to conduct the hands-up survey presents itself. If the School Champion or a teacher at the school carries out the survey, the Bike It Officer and Research and Monitoring Unit have limited control over the timing of the survey. The dates surveys are conducted are recorded on the form but it is difficult to discern the impact that the timing of the survey could make without precise details of exposure to the Bike It programme (through the Bike It Officer, School Champion or teacher) at the school. Such details would include individual details of number of visits, hours of contact, and promotion carried out at the school in the absence of the Bike It Officer. Seasonality may also impact findings. However, the

bicycle shed counts go some way to support the notion that weather is not the main factor influencing children's travel choices.

In addition, the hands-up survey is based on self-reporting. Children taking part in the survey (aged approximately 9-12 years) may report what they believe the surveyor, in this instance the Bike It Officer, School Champion or teacher, expects. Question 1 of the hands-up survey may lead children as it immediately raises the issue of cycling. Children may also report what they consider will reflect positively on themselves. A further limitation may be that children experience fallibility of memory which can impact on the reliability of self report data.

Age appropriate language is also essential. In the Bike It pilot conducted in the academic year 2004-2005, individual surveys were carried out with pupils. Bike It Officers reported that this approach proved both time consuming for the person administering and difficult for children of different abilities within the same year group to complete. The hands-up approach has provided opportunities for the person surveying to explain the questions and responses to the whole cohort before they are asked to put their hands-up, rather than working with large numbers of students on an individual basis.

The findings from the academic year 2008-2009 must also be treated with caution when determining the extent of the change in travel behaviour which can be attributed explicitly to the Bike It programme, independent of interventions that may be taking place in the local area and climate of travel behaviour more generally (e.g. physical infrastructure, soft measures, climate change, school congestion, etc.).

1.1.4 Counts of parked bikes

Alongside the hands-up surveys, Bike It officers conduct counts of the number of bikes parked in bicycle storage facilities at the Bike It school. Counts are conducted as regularly as possible. Each Bike It officer must record a minimum of three counts per term at each school (coinciding with the minimum number of activities delivered). The counts are logged onto the online web based monitoring system where they can be viewed or downloaded for further analysis.

The bicycle shed counts are used to highlight particularly high levels of cycling at schools on certain days, and are not used to accurately track changes in cycling trends. The counts can also point to the success of particular events conducted by the Bike It Officer which may enable them to focus time and resources to best effect in the future.

The online monitoring system also has the capacity to allow schools to enter their own counts. This function is currently being used to successfully engage Bike It schools.

1.1.5 Counts of parked bikes - limitations

While the bicycle shed counts are conducted on a regular basis, they are only conducted when logistics enable the Bike It Officer to be visiting or passing the school. The pattern of regularity between Bike It Officer areas and individual schools differs greatly. The most accurate way of monitoring changing cycle levels at an individual school would be through a daily count which is currently not possible. The implications of this are that a time series analysis is not possible with the current data. Accurate detection of change depends on a number of constants. Many factors present within the bicycle shed counts prevent the identification of trends. Amongst these are the frequency of counts, the amount of physical space available, the influence of the Bike It Officer 'on site' and the influence of weather on counts.

1.1.6 Activity logs

The Activity Log has been designed to record the positive cycling experiences delivered through Bike It which are not picked up by the hands-up survey and the bike counts. The activity log records the number of participants (pupils, staff, parents and siblings) at every single activity delivered by the Bike It officer. Bike It officers are required to record a minimum of 3 separate activities per school per term.

Counts of participants at activities are entered into the online database. An extensive drop down list of activities is provided for selection, allowing officers to enter meaningful data. The list also allows for the categorisation of activities for analysis.

1.1.7 Activity logs - limitations

It should be noted that activity logs represent multiple experiences and double counting of individual pupils, parents and staff is not taken into account. It is not possible to use the activity log to identify trends.

1.1.8 Head teacher and school champion and Local Authority surveys

Surveys of Head Teachers or School Champions, along with key Local Authority contacts for the programme are conducted during June, following a full academic year of Bike It delivery. The survey can be considered a post project evaluation survey. Questions to head teachers and school champions address issues including the impact of particular activities during Bike It delivery, the impact of Bike It on factors such as car traffic outside of the school and the physical activity awareness of pupils. Local Authorities are asked questions about the way in which the project has helped them deliver their own strategies or objectives.

1.1.9 Head teacher and school champion surveys - limitations

Responses to the survey may be subject to 'positive self selection', i.e. it may be that those in support of the project are more willing to complete the survey as compared with those who are less satisfied. It could be argued however, that this relationship could also be reversed.

1.1.10 Contact

For further information on the data collection and analysis, or for queries and requests concerning the monitoring of the Bike It project, please contact:

alex.bulmer@sustrans.org.uk or call 0191 2699370

Appendix

Table 1: Overall number of schools and responses for Bike It 2008-2009

Bike It Officer Area	Number of schools	Response Q1		Response Q2		Response Q3		Response Q4		Response Q5	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Ashford	5	1480	1256	1341	1216	1322	1267	1315	1253	1342	1258
Aylesbury	5	703	653	704	644	700	644	704	673	719	679
Birmingham	9	2340	2073	1121	2000	1121	1879	2338	2039	2340	2032
Brighton & Hove	4	562	508	564	480	550	413	575	485	570	472
Bristol	1	156	161	-	-	-	-	157	157	161	142
Bury	4	372	835	-	-	-	-	372	883	377	909
Coventry	4	838	951	-	-	-	-	902	946	894	949
Derby	3	264	250	264	250	263	250	263	250	249	249
Doncaster	3	834	736	838	721	787	709	812	745	884	720
Exeter	5	1204	750	1182	735	1179	760	1223	719	1251	759
Gateshead & South Tyneside	1	103	48	118	50	118	48	120	49	123	51
Knowsley, Sefton and St Helens	6	887	754	-	-	-	-	883	802	884	793
Lancaster	4	403	571	419	577	421	571	419	571	425	571

Leicester	5	610	661	610	662	610	662	610	661	610	661
Lincoln	2	299	307	77	73	77	73	263	313	295	316
Liverpool	11	1757	1562	470	448	532	448	1727	1577	1750	1552
Luton, Bedford & St. Albans	5	1777	1751	260	276	251	261	1759	1743	1774	1744
Reigate & Banstead	6	1162	1157	1157	1159	1170	1147	1127	1171	1229	1158
Sheffield	4	356	445	355	451	354	465	352	442	354	445
Slough and South Bucks	9	1985	1800	-	-	-	-	1992	1803	1989	1783
Stockport	3	821	676	-	-	-	-	791	693	469	689
Swindon	3	338	322	345	319	316	318	353	320	346	294
Teesside	9	2668	1362	-	-	-	-	2668	1362	2668	1362
Thames Gateway	11	2483	2293	2441	2297	2431	2405	2386	2286	2452	2310
Total	122	24402	21882	12266	12358	12202	12320	24111	21943	24155	21898

Table 2: Number of schools and responses for Bike It London 2008-2009

Bike It Officer Area	Number of schools	Response Q1		Response Q2		Response Q3		Response Q4		Response Q5	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Havering, Lambeth and Newham	8	940	852	690	608	640	584	1051	898	990	887
Hackney, Hammersmith & Fulham and Wandsworth	9	2588	1789	625	1010	625	804	2560	1893	2540	1888
Camden, Southwark and Haringey	6	792	721	765	705	719	714	825	740	773	724
Tower Hamlets	5	828	713	790	716	811	712	814	713	797	712
Total	28	5148	4075	2870	3039	2795	2814	5250	4244	5100	4211

Table 3: Number of schools and responses for Bike It Wales 2008-2009

Bike It Officer Area	Number of schools	Response Q1		Response Q2		Response Q3		Response Q4		Response Q5	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Neath Port Talbot	12	1170	1186	94	91	94	90	1210	1186	1246	1185
Conwy	8	975	627	904	1087	888	1058	907	1085	905	1085
Total	20	2145	1813	998	1178	982	1148	2117	2271	2151	2270