



## **Bike It Review 2008 Technical Report**

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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 2006-2007. This data is presented in the Bike It Review 2008.

### **Data collection**

There are two data collection methods used in the monitoring of the Bike It programme: hands-up surveys and counts of bikes in bicycle sheds. The hands-up surveys provide data on cycling frequency, mode of travel to school and school travel preferences at individual schools and across the Bike It programme. The bicycle shed counts are used to provide examples of cycling activity at certain schools on particular days.

### **Hands-up surveys**

The hands-up survey asks three questions of pupils involved in the project at Bike It schools. The surveys are usually administered by the Bike It Officer, although in some cases teachers or School Champions administer the survey in the absence of the Officer. The pre-intervention hands-up survey is carried out as soon as possible when the Bike It Officer begins work at a school. Essentially, this is prior to any active role in the school. The follow-up is conducted at the end of the summer term, or as soon as the officer has completed a full academic year at the individual school (some Bike It Officers may begin delivery of the programme between January and July due to the nature of programme growth, these Officers will complete survey delivery in the following July).

The Bike It Officer responsible for administering the survey is provided with an instruction/guideline document. There is an additional document available for teachers or School Champions who may be delivering the survey in the absence of the Bike It Officer.

The hands-up survey asks three 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. How did you travel to school *today*?

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

3. How would you most like to travel to school?

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

Further details recorded in the survey are: school name, date of survey, class, weather, name of Bike It Officer or name of the person conducting the survey in the absence of the Bike It Officer.

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.

The data presented in the Bike It review relate to Bike It Officers working on projects in England and London. The figures are reported separately due to funding variations between the London project and the overall England programme. London is therefore not included in overall change figures supplied in the review.

The total number of schools included in the overall England figures are presented in Table 1. The number of responses to each question is also shown. This exercise has been repeated with reference to the data collected in London which is reported separately, see Table 2.

**Table 1: Number of schools and responses for England used in Bike It Review analysis 2006-2007**

Bike It Officer Area	Number of schools	Response Q1		Response Q2		Response Q3	
		PRE	POST	PRE	POST	PRE	POST
Manchester	3	687	705	722	735	682	719
Derby	4	905	805	910	827	908	865
Lancaster	9	1,692	2,133	2,187	2,155	2,070	2,182
Exeter	9	2,904	2,307	2,894	2,309	2,828	2,204
Brighton and Hove	8	1,510	1,433	1,505	1,431	1,509	1,427
Bristol	3	784	435	782	362	774	415
Aylesbury	9	2,592	2,084	2,830	1,939	1,214	1,758
Total	45	11,073	9,902	11,830	9,758	9,985	9,606

**Table 2: Number of schools and responses for London used in Bike It Review analysis 2006-2007**

Bike It Officer Area	Number of schools	Response Q1		Response Q2		Response Q3		Response Q4	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST
London	7	1,563	1,125	1,732	1,156	1,612	1,163	1,597	1,159

NOTE: Darlington data are not included in the review due to changes in personnel and level of comparative data availability from Bike It schools.

The Bike It Officer returns the complete hands-up survey forms to Sustrans Research and Monitoring Unit. The data is captured by an external data capture company. When the data is returned to the Research and Monitoring Unit, the data is checked for quality and analysed using SPSS to generate frequencies for each question, for each school. The data is provided at the individual school level. It is also aggregated by Bike It Officer area and Government Office Region, providing figures for these categories pre- and post-intervention. The data is aggregated across the whole programme (except for London) to give overall figures for Bike It, pre- and post-intervention. The following section provides an in-depth explanation of the analysis used.

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 though 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  $i = 1, 2, 3$  and in each of the three questions we have a number of responses options  $j = 1, 2, 3, \dots$  we get the following notation for the numbers of students answering to the responses:

1. Do you cycle to school?

Response options for the pre 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  $j = 1,2,3,4,5$

2. How did you travel to school *today*?

Response options for the pre are:  $m_1^2$  for Car,  $m_2^2$  for Walk,  $m_3^2$  for Bus,  $m_4^2$  for Cycle,  $m_5^2$  for Train,  $m_6^2$  for Other

Responses for the post survey are noted correspondingly with  $n_j^2$  for  $j = 1,2,3,4,5,6$

3. How would you most like to travel to school?

Response options for the pre are:  $m_1^3$  for Car,  $m_2^3$  for Walk,  $m_3^3$  for Bus,  $m_4^3$  for Cycle,  $m_5^3$  for Train,  $m_6^3$  for Other

Responses for the post survey are noted correspondingly with  $n_j^3$  for  $j = 1,2,3,4,5,6$

As we can see in table 1 and 2 above, 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  $i = 1,2,3$

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

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

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 3: Example of frequencies for Question 1 of hands-up survey**

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

### Limitations

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 is 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 2006-2007 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.).

### **Bicycle shed counts**

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. The counts are conducted as regularly as possible when the Bike It Officer visits the school. The bicycle shed counts are logged using a standardised Excel spreadsheet. The spreadsheet records the name of the Bike It Officer and Bike It area, the name of the school, the number of pupils on the school roll, the number of spaces for bicycles, the actual number of bicycles on the day of the count, the weather on the day of the count, and details of any activity conducted by the Bike It Officer on that particular day, for example, bike rides or bike maintenance.

The bicycle shed counts are used to highlight particularly high levels of cycling at particular schools on particular days. They are not used to accurately track changes in cycling trends. The bicycle shed counts 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.

### **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.

### **Additional data sources**

Bike It Officers also collect information on Bike It activities that they conduct in individual schools (i.e. the number of participants at sessions such as bike maintenance and other Bike It activities). This data is stored by the individual Bike It Officer for personal reporting and is not run through the quality assurance systems at Sustrans' Research and Monitoring Unit.

### **Pupil Level Annual School Census Data (PLASC)**

The Pupil Level Annual School Census 2007 included a question on travel. PLASC records data at the pupil level, by school and by Local Authority area. The 2007 PLASC data are collected between October and December 2006.

The question on school travel asks: How do you usually travel to school? The response options for this question are: Walking; Cycle; Car; Car share; Public bus service; Dedicated school bus; Bus – type not known; Taxi; Train; London Underground; Metro, tram or light rail; Boarding pupil – not applicable; Other form of transport.

The question on school travel is only mandatory for schools with a School Travel Plan. This is approximately 56% of schools. The data presented in the Bike It Review are from these schools. Where broken down by category (i.e. particular towns) the percentage is based on a different number of schools per location.

Data for schools with a School Travel Plan in the Cycling Demonstration Towns (Aylesbury, Exeter, Brighton and Hove, Lancaster, and Derby) were extracted from the PLASC dataset made available to Sustrans through the Department for Children Schools and Families. The data from these schools was aggregated using Excel to provide an overall percentage for each of the travel modes.

The PLASC data has been presented in the Bike It Review 2006-2007 to enable Sustrans to demonstrate the added value that Bike It provides in the Cycle Demonstration Towns.

### **Limitations**

When using PLASC data alongside data collected by the Bike It hands-up survey approach, there are important factors to consider when drawing conclusions about what this data means in comparative terms. Firstly, the survey timing differs. Where PLASC data is gathered between September and January the actual PLASC submission day in January, the Bike It hands-up survey is conducted in September, or as soon as possible when the Bike It Officer is in post. The PLASC data also relates to overall, whole school figures, whereas the Bike It data is collected from children within the delivery cohort, in most cases one or two school year groups. PLASC is only mandatory to schools with a School Travel Plan, this may have implications for the data presented. The question PLASC utilises differs from the comparative question asked as part of the Bike It monitoring. PLASC asks children to state how they *usually* travel to school. In Bike It, children are asked how they travel on the day of the survey, i.e. *today*. It is also important to consider other aspects of data reliability which may be a result of survey format (Bike It has a small number of questions compared to PLASC).

### **Contact**

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