

## How accurate are the GBTS estimates?

As with all surveys, estimates from the GBTS are subject to sampling error. This is because we do not interview the entire GB population. Using a weighting procedure based on population profiles, results from the survey are "grossed up" to population - we take the results from our survey respondents, and use these to estimate how many trips were made by the total GB population. Generally speaking, the larger the sample, the smaller the sampling error.

## How do we measure the survey accuracy?

We can be very confident that results are accurate at national level, but there is a higher degree of error in results at a regional level. A statistical measure known as a confidence interval is used to quantify the accuracy. Conventionally, a 95% confidence interval is used. This means that were we to repeat the survey a large number of times, then 95% of the intervals would contain the true value. The larger the sample size, the narrower the interval.

As an example, the number of trips estimated for England each year has a margin of error of +/-3% at the 95% confidence interval. In other words, we can be 95% certain that the true number of trips taken in England each year is within +/-3% of the number estimated by the survey. In contrast, the figure rises to +/-6% for annual results for the North West and +/-12% for the North East region.

**The table below provides an estimate of the margins of error for the sample:**

	Reported Annual Trips 2010 (millions)	Approximate Sample (thousands)	Margin of Error
GB	<b>115.7m</b>	<b>17,000</b>	<b>+/-2%</b>
England	95.5m	14,000	+/-3%
West Midlands	7.8m	1,100	+/-8%
East	8.8m	1,300	+/-7%
East Midlands	7.7m	1,100	+/-9%
London	11.4m	1,500	+/-7%
North West	12.2m	1,800	+/-6%
North East	3.6m	500	+/-12%
South East	16.2m	2,400	+/-6%
South West	19.2m	2,900	+/-5%
Yorkshire and Humberside	10.0m	1,500	+/-7%

Based on the examples above, this indicates:

That in 2010, 95.5 million trips were taken within England, based on approximately 14,000 recorded trips, with a sampling error of 3%. In other words, there is a 95% likelihood that the true annual number of trips for England was in the range of 92.6m to 98.4 million. In reality, though not strictly statistical, it is likely that the "true" figure is likely to be broadly within these ranges, rather than at the outer limits of the margin of error.

### **What about nights and spend?**

The table above provides confidence intervals for the number of trips. Confidence intervals for nights and expenditure will be bigger. This is because each trip has the added variability due to the number of nights and an additional variability for the expenditure each night. In other words, it is likely that one individual will only take between 1 or 2 trips in a 4 week period, but each trip could last between one night and a month, and spend anything from zero to thousands of pounds. Therefore if the sample size is quite small, we can observe big variations on expenditure and nights figures.