

Bus Punctuality Questionnaire: Guidance Notes

Background:

This questionnaire is for upper-tier and single-tier Local Authorities, Passenger Transport Executives/Integrated Transport Authorities and Transport for London and requires information on the proportion of non-frequent local bus services (fewer than 6 buses an hour) running on time and the average excess waiting time for frequent local bus services in each local authority area during the financial year. The collected data is used to publish statistics against the departmental indicator "Proportion of non-frequent bus services running on time in England" (see [here](#)), as well as factoring into funding allocations for the Integrated Transport Block (ITB). Statistical tables [bus0902](#) and [bus0903](#) are also updated annually using the collected data. This return requires the information which was previously (to 2009-10) provided to Department for Communities and Local Government as National Indicator 178.

Definition:

Bus punctuality is defined as keeping public service buses to their scheduled bus departure times and is measured in two different ways:

- the percentage of **non-frequent** buses on time
- the average excess waiting time for **frequent** services

Scheduled services are those services timetabled by bus companies (both commercial and those supported by local authorities).

Non-frequent services (fewer than 6 buses per hour) are measured by whether the bus departs within its 'on-time' window of 1 minute 0 seconds early to 5 minutes 59 seconds late. Buses that fail to run should be treated as 'late' and not ignored in the calculations.

Frequent services (6 or more buses per hour) are measured by the excess waiting time experienced by passengers over and above what might be expected with a service that was always on time.

Calculation:

The information required is reported as two parts:

Q1: The proportion of non-frequent scheduled services on time, given by:
 $(0.5) \times (\% \text{ of buses starting their route on time}) + (0.5) \times (\% \text{ of buses on time at intermediate timing points})$
'On time' is defined as between 1.00 minute early and 5 minutes 59 seconds late.

Q2: The average excess waiting time for frequent services (not applicable to all areas) is calculated as the difference between the average observed and average scheduled waiting times (in minutes). Example calculations are given below:

Example timetable:

The table below shows an example timetable for a frequent service with 6 buses scheduled per hour. The scheduled departure times are used to calculate the average **scheduled waiting time**.

Scheduled departure times	Scheduled headway (minutes)
0800	
0810	10
0820	10
0830	10
0840	10
0850	10

Example service:

This table below shows a set of departure times for the same frequent service. These are used to calculate the average **actual waiting time**.

Actual departure times	Actual headway (minutes)
0802	
0811	9
0819	8
0830	11
0850	20
0900	10

Calculating excess waiting time:

The average **excess waiting time** is the difference between the average scheduled waiting time and the average actual waiting time.

Scheduled waiting time (SWT)

$$SWT = \frac{\sum_i^n (\text{Scheduled headway}_i^2)}{2 \times \sum_i^n (\text{Scheduled headway}_i)}$$

$$SWT = \frac{10^2 + 10^2 + 10^2 + 10^2 + 10^2}{2 \times (10 + 10 + 10 + 10 + 10)}$$

$$SWT = \frac{500}{100}$$

$$SWT = 5 \text{ minutes}$$

Actual waiting time (AWT)

$$AWT = \frac{\sum_i^n (\text{Observed headway}_i^2)}{2 \times \sum_i^n (\text{Observed headway}_i)}$$

$$AWT = \frac{9^2 + 8^2 + 11^2 + 20^2 + 10^2}{2 \times (9 + 8 + 11 + 20 + 10)}$$

$$AWT = \frac{766}{116}$$

$$AWT = 6.60 \text{ minutes}$$

Excess waiting time (EWT)

$$EWT = AWT - SWT$$

$$EWT = 6.60 - 5$$

$$EWT = 1.60 \text{ minutes}$$

Data Source:

As automatic vehicle location (AVL) data is becoming more widely available, this is now the preferred data source for measuring bus punctuality.

Where AVL data covers all services, if possible calculations should be based on all available data relating to weekdays during term time and in peak hours (i.e. between 8am and 10:30am and between 3pm and 5:30pm). If this is not possible a representative sample of AVL data should be taken. In this case please contact the DfT Bus Statistics team for further guidance.

If AVL data is not available, local authorities may perform manual observations. As above, these should be carried out on weekdays during term time and should be mainly in peak hours.

Return Format (including decimal places)

Q1: Percentage of non-frequent services on time, to nearest whole number.

Q2: Excess waiting time of frequent services – number of minutes with two decimal places (e.g. 1.74 minutes).

Further Guidance:

Revised guidance for bus operators on punctuality and reliability standards was published in 2018 by the Traffic Commissioners (see [here](#)).

FAQs:

1) Will data be reported at the individual London Borough spatial level or will it just be available at the London wide (Transport for London) level?

Transport for London will report one figure for the whole of London.

2) Where Bus Company Data (including electronic information) or local authority electronic monitoring is not available, are other methods such as the collection of data using manual surveys acceptable?

Local authority data from observations at the side of the road are, of course, acceptable. However, this method is very labour-intensive both in terms of collecting the actual data, as well as doing the necessary matching with scheduled departure data. Care also needs to be taken that the data are not compromised by changes in the sites used or by any special factors affecting the sites being monitored.