

## Measurement template

Field	Notes
<b>Short title</b>	Reliability of journeys on Highways Agency's motorway and A road network
<b>Technical definition</b>	The reliability of journeys on Highways Agency's motorway and A road network is measured by the percentage of 'journeys' that are 'on time'. For this measure, a 'journey' represents travel between adjacent major junctions on the network. An 'on time journey' is defined as one which is completed within a set reference time, drawn from historic data on that particular section of road.
<b>Rationale</b>	One of the Department's structural reform priorities is to 'Invest in our roads to promote growth, while reducing congestion and tackling carbon'. This indicator monitors what studies have repeatedly shown to be the biggest problem caused by congestion – unreliable journey times.
<b>Formula</b>	<p>The measure is calculated as follows:</p> <ol style="list-style-type: none"> <li>1. Observed 'journey' times are calculated for each junction to junction road link (stretch of road between major junctions) in both carriageway directions for each 15 minute period.</li> <li>2. Pre-determined reference times are set for each of approximately 2,500 links, each 15 minute period of the day and for each of 13 day types (e.g. first working day of week). Reference times are based on historical averages specific to the link, time period and day type. A fixed tolerance of three seconds per mile is added to historical average journey times to derive references.</li> <li>3. The observed 'journey' times are compared to the pre-determined references. Where observed times are equal to or less than the reference times, these 'journeys' are deemed to be 'on time'.</li> <li>4. Where links are affected by roadworks, the observed 'journey' times are compared to alternative reference values, based on the temporary speed limit in place on that link.</li> <li>5. Performance for individual links and 15 minute time periods is aggregated based on respective traffic levels (flow * link length). This ensures those with higher numbers of vehicles travelling on them and/ or longer links</li> </ol>

have a larger contribution to the overall statistics.

The following worked example shows how 'on time' performance is calculated for specific links/time periods and how link level performance is aggregated.

Calculation of performance for M25 Junction 15 to 16 (clockwise) on Wednesday 15<sup>th</sup> September 2010, 08:45 to 09:00

Reference time <i>(based on historical average for the link on normal working Wednesdays between 08:45 and 09:00)</i>	333 seconds
Observed time <i>(for the link on 15/9/2010 between 08:45 and 09:00)</i>	300 seconds
'Journey' time status	'On time'

Calculation of performance for M40 Junction 1a to 2 (westbound) on Wednesday 15<sup>th</sup> September 2010, 08:45 to 09:00

Reference time <i>(based on historical average for the link on normal working Wednesdays between 08:45 and 09:00)</i>	267 seconds
Observed time <i>(for the link on 15/9/2010 between 08:45 and 09:00)</i>	270 seconds
'Journey' time status	Not 'on time'

Calculation of **combined** performance for M25 Junction 15 to 16 and M40 Junction 1a to 2 on Wednesday 15<sup>th</sup> September 2010, 08:45 to 09:00

	M25 J15-16	M40 J1a-2
Link length	5 miles	5 miles
Flow along link <i>(for date/time period)</i>	1,500 vehicles	1,000 vehicles
Vehicle miles travelled on link <i>(flow * link length)</i>	7,500 vehicle miles	5,000 vehicle miles
'On time' performance for link	100%	0%
Total vehicle miles 'on time' for links	7,500 vehicle miles	
Total vehicle miles for links	12,500 vehicle miles	
Combined 'on time' performance for links <i>(total vehicle miles 'on time' / total vehicle miles)</i>	60%	

Multiple links and time periods are aggregated in a similar way to calculate overall performance across the network in any given period.

**Start date**

June 2011

Notes

1. After first publication in June 2011, the statistics were withdrawn shortly after while further quality checks were carried out on the raw datasets underpinning the measure. Publication of national level statistics re-commenced in November 2011.
2. Following the implementation of methodology changes in the March 2013 publication (data to January 2013) the historic national series was revised at this point.
3. Publication of statistics for individual road sections re-

	commenced in August 2013.
<b>Latest data</b>	In the year ending June 2013, provisional data show that 77.2 per cent of journeys on the Highways Agency managed network were 'on time'.
<b>Performance</b>	Changes in performance will be reflected through changes in 'on time' levels.
<b>Behavioural impact</b>	No perverse incentives are anticipated.
<b>Comparability</b>	Reliability is highly complex to measure. As such, there are currently no internationally recognised standards to enable comparison between countries.
<b>Collection frequency</b>	Data are collected continuously via monitoring equipment, but collated and processed to produce 'on time' performance on a monthly basis. Data are published on a monthly basis.
<b>Time lag</b>	Publication of performance takes place around 5-6 weeks after the end of each month. This period allows for the collation, processing and validation of the statistics to take place. Publications are pre-announced in line with National Statistics requirements.
<b>Data source</b>	Journey times are sourced from in-vehicle Global Positioning System (GPS) data, which have been mapped to the Highways Agency Traffic Information System (HATRIS) network. Traffic flow data from Highways Agency automatic count points are also used.
<b>Type of data</b>	Aggregated data for complete network – National Statistic Disaggregated data for individual sections of the network – Experimental Statistics
<b>Robustness and data limitations</b>	Where observed journey time estimates are not available to estimate reliability, performance is imputed at a link level by month with corresponding day-time (06:00-20:00) and night-time (20:00-06:00) averages where there is sufficient data. Where sufficient data are not available, national day-time and night-time averages for that month are used to impute individual road sections and time periods.  As a National Statistic, the measure is produced and validated by Government statisticians.  Reliability data for individual road sections are not published where estimates are based on high levels of imputed data.

<b>Collecting organisation</b>	Highways Agency/Department for Transport
<b>Return format</b>	Percentage of 'journeys' that are 'on time'
<b>Geographical coverage</b>	England
<b>How indicator can be broken down</b>	By junction to junction road links.
<b>Further guidance</b>	A full methodology document is available at:  <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/51127/Methodology_for_calculation_of_reliability_on_Highways_Agency_s_motorway_and_A_road_network.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/51127/Methodology_for_calculation_of_reliability_on_Highways_Agency_s_motorway_and_A_road_network.pdf</a>