

Highways Agency Specification 2013-14 – Technical Note

Field	Notes
Short Title	Network Availability.
Performance Specification Reference	Output 4 – PS 4.2
Requirement / Output Details	The network operator should monitor and report on network availability, reported as the percentage of lane kilometres available on the SRN, to provide a direct indication of how well both planned and unplanned activities are managed to reduce negative impacts on road users.
Technical Definition	The availability of the Highways Agency's motorway and A road network is measured by the percentage of lane kilometre days available. A lane is considered unavailable if it is closed because of roadworks recorded by the agency and its service providers or incidents recorded by the regional control centres.
Rationale	Network availability is a measure of the proportion of the network that is available to road users, i.e. of the lane kilometres not closed because of planned or unplanned activities.
Formula	<p>The measure is calculated as follows:</p> <ol style="list-style-type: none"> Length is measured in lane-km-days for each month and each section of the strategic road network: $[\text{Total Lane-km-days}] = [\text{Length of section (km)}] * [\text{Number of lanes}] * [\text{Number of days in the month}]$ Availability percentage is calculated as: $[\text{Availability}] = [\text{Lane-km-days available}] / [\text{Total Lane-km-days}] * 100$ All lanes are considered available unless they are closed to traffic because of roadworks or incidents: $[\text{Lane-km-days available}] = [\text{Total Lane-km-days}] - ([\text{Roadworks}] + [\text{Incidents}])$ [Total Lane-km-days] and [Roadworks] are extracted from the roadworks records on the agency's asset management system for permanent lanes. [Roadworks] are the lane-km-days not available because of roadworks as recorded by the agency and its service providers. [Incidents] are the lane-km-days not available because of lane closures recorded in operational data by the regional control centres. Lane closures are included only if roadworks are not

Field	Notes
	<p>indicated on the record (to avoid double-counting).</p> <p>6. The length of a lane closure caused by an incident is not recorded on the operational data, so the assumption is made that a full closure of the carriageway affects the entire road link (junction-to-junction).</p> <p>7. A partial closure caused by incident is assumed to consist of a 100m lane closure plus a coned-off tapered section. The taper runs at 100m per lane.</p> <p><i>Example: An incident in lane two where lanes one and two are closed would result in a total loss of 300m of carriageway, or 500m of lane length (100m of closure in both lanes one and two, plus a taper closing 100m of lane two and 200m of lane one).</i></p> <p>[Incidents] = [Incidents, full closure] + [Incidents, partial closure]</p> <p>with</p> <p>[Incidents, full closure] = $T * N * L$</p> <p>[Incidents, partial closure] = $T * N * 0.1\text{km} (1 + \frac{1}{2} * (N + 1))$</p> <p>where</p> <p>T = Duration of closure</p> <p>N = Number of lanes closed</p> <p>L = Length of the road link</p> <p><u>WORKED EXAMPLE 1 – Incident, partial closure</u></p> <p>A record on the operational database describes an incident on a three-lane motorway with a start time in the time period 17:30-17:45 and an end time in the time period 18:30-18:45. One lane was closed and no roadworks were present.</p> <p>Calculation:</p> <ul style="list-style-type: none"> • [Duration of closure]: $T = \text{Four 15-minute time periods (17:30-17:45 to 18:15-18:30)} = 1 \text{ hour} = 1/24 \text{ days}$ • [Number of lanes closed]: $N = 1 \text{ lane}$ • [Incidents, partial closure] = $1/24 \text{ days} * 1 \text{ lane} * 0.1\text{km} * (1 + \frac{1}{2} * (1 + 1)) = 0.008 \text{ lane-km-days}$ <p><u>WORKED EXAMPLE 2 – Availability Calculation</u></p> <p>For February 2013 the roadworks records on the asset management system show</p> <ul style="list-style-type: none"> • Total network: 1,095,300 lane-km-days

Highways Agency Specification 2013-14 – Technical Note

Field	Notes
	<ul style="list-style-type: none"> Closed (roadworks): 9,788 lane-km-days <p>Lane closures recorded on the operational data in February 2013:</p> <ul style="list-style-type: none"> Closed (incidents): 674 lane-km-days <p>Calculation:</p> $[\text{Availability}] = 1 - (9,788 + 674) / 1,095,300 = 99.04\%$
Start Date	To be published with the performance specification report for 2013/14.
Performance	Changes in availability will be reflected through changes in percentage of lane kilometre days available each month. An increase in availability indicates fewer lane closures because of roadworks and/or incidents.
Behavioural Impact	Reductions in availability are caused primarily by the requirement for roadworks and the occurrence of incidents. Reduced availability must be interpreted in this context to avoid perverse incentives – reduced availability will result from increases in road construction activity, unless that activity takes place off the line of existing roads. This measure does not differentiate between lanes being unavailable at times of peak demand or at other times such as at night.
Comparability	No comparisons are performed at the current time. The Agency has close working relationships with a number of strategic road operators in other countries, and in the future this may lead to the ability to do direct comparisons with comparable published metrics.
Collection Frequency	<p>Data are collected continuously via the asset management system and operational database, but collated and processed on a monthly basis.</p> <p>There is a risk that the transition to a new asset management system may cause short-term disruption to the production and stability of the availability measure.</p>
Clearance Process	Values are computed monthly and are presented to the Agency's Network Performance Group for approval.
Time Lag	Reporting of availability takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data.

Highways Agency Specification 2013-14 – Technical Note

Field	Notes
Data Source	Data is sourced from the Highways Agency's asset management system which captures roadworks recorded by the service providers and from the operational database which captures information about incidents recorded by the regional control centres.
Type of Data	Management Information.
Robustness and Data Limitations	<ul style="list-style-type: none"> • The measure relies on the accuracy of the data recorded on the asset management system and on the operational database. The extracted data is not further validated beyond basic checks. • The lengths of closures caused by incidents are estimated since they are not recorded in the operational data. Lane closures are considered in 15 minute intervals in line with other measures used by the agency. • Operational data only captures incidents reported to the regional control centres.
Collecting Organisation	Highways Agency and its service providers.
Return Format	Percentage of lane kilometre days of the Strategic Road Network that was available in England.
Geographical Coverage	England.
How Indicator Can be Broken Down	This measure is an aggregate value for the Strategic Road Network in England.