Road Condition Statistics: Notes and definitions

This note provides definitions used for road condition statistics. It also includes useful information on the source of the data.

1. Source

The statistics come from a variety of sources:

**SCANNER surveys:** these are automated surveys carried out using SCANNER vehicles. Local authorities commission them to assess the surface condition of their ‘A’, ‘B’ and ‘C’ road network.

**TRACS surveys:** these are automated surveys carried out using the HARIS vehicles. They are used to assess the surface condition of the trunk ‘A’ and motorway network in England. These roads were managed by the Highways Agency until April 2015, when they were taken over by Highways England.

**Coarse / Detailed Visual Inspections (CVI / DVI):** these are manual visual inspections used to assess road surface condition. They are used on local authorities' unclassified road network but some authorities also use them on their classified network.

Prior to 2011/12, statistics on unclassified roads were collected by the Association of Directors of Environment, Economy, Planning and Transport (ADEPT, formerly the County Surveyors’ Society). These are now collected via DfT’s road condition surveys alongside statistics for classified roads.

**Skidding resistance survey:** used by local authorities and Highways England, skidding resistance is a measure of the road surface contribution to the frictional forces developed between a vehicle’s tyres and the road when accelerating, braking or cornering. LA results are presented as three year averages as it is common practice for authorities to survey their principal road network over two or three year cycles. Trunk roads are surveyed for skidding resistance every year.


2. Definitions

**Road Condition Indicator (RCI)**

---

SCANNER surveys measure a number of parameters at 10-metre spacing along the road. The outputs from the measured parameters can be combined to produce a single figure giving an indication of the surface condition at that specific location. See Sections 3.4 - 3.5 in the Technical Note for details on the parameters measured and how they are used, and Section 3.6 for how the parameters are used to calculate an RCI value.

RCI outputs are scored between 0 and 315. Scores between 0 and 40 indicate that the observed road section is in good condition. This category is referred to as ‘green’ or ‘good’. Scores over 40 but below 100 indicate that the location is showing some deterioration and should be investigated to see if the road needs treatment. This category is referred to as ‘amber’. Any road sections scoring 100 or higher are likely to show considerable deterioration and may need maintenance within the next 12 months. This category is referred to as ‘red’ or ‘poor’.

The proportion of the network that is ‘red’ is reported to DfT by local authorities via Single Data List items in the road condition surveys that are sent to authorities each year. These figures are presented in table RDC0120 and are used to produce the regional and national figures that are presented in RDC0121.

Road network and classification


3. Specific issues

Potholes

A SCANNER vehicle does not record a pothole as being specifically that. Instead, it would note that there is surface damage and deterioration in the area according to the parameters it measures.

Therefore, although the statistics are unable to provide information about the number and size of potholes, any road section which has potholes is likely to get a high RCI score. Similarly, any road section with a high RCI score is likely to have a wide range of deterioration, possibly including potholes.

Winter damage

SCANNER surveys are carried out on a financial year cycle, with each local authority aiming to survey set proportions of their road network between April and March each year. Local authorities will seek to survey at least 50 per cent of their ‘A’ network in each direction every year and 50 per cent of their ‘B’ and ‘C’ network in one direction every year.
As SCANNER surveys are mounted on vans and use lasers to scan the road surface, surveys cannot take place when snow, ice or standing water is on the road. This means that a significant proportion of the surveys take place between May and October each year.

The result of the survey timing is that damage from severe winter weather, as happened, for instance, in the winters of 2010/11 and 2013/14, may not be picked up until the following year. In addition, any severe damage might be repaired before the surveys start, so it is possible that such severe damage is never recorded by SCANNER vehicles.

4. Statistical conventions

Units: Figures are shown in italics when they represent percentages, indices or ratios
Rounding of figures: In tables where figures have been rounded to the nearest final digit, there may be an apparent discrepancy between the sum of the constituent items and the total shown.
Conversion factors:  
1 kilometre = 0.6214 mile  
1 billion = 1,000 million
Symbols:  
: = not available  
. = not applicable  
- = negligible (less than half the final digit shown)  
0 = nil  
* = sample size too small for reliable estimates  
ow = of which  
| or _ = break in the series  
a = data may not be comparable  
p = provisional data  
r = revised
5. Glossary of technical terms

More detailed explanations of some of the terms can be found in the Technical Note.

All-purpose trunk roads

Centrally owned and maintained ‘A’ roads.

BVPI

Best Value Performance Indicator – BVPIs showed the relative performance of English local authorities for different aspects of performance. These were introduced in 2000/01 and were last reported for 2007/08. They were replaced by the National Indicator Set which came into effect from April 2008. This in turn was replaced by the Single Data List from April 2011.

Carriageway

The paved area of the highway carrying vehicular traffic and including any hard shoulders and marginal strips.

Classified roads

Local authority owned and maintained roads with ‘A’, ‘B’ or ‘C’ classification. Note that in the report’s tables and figures, the term ‘principal roads’ refers to local authority ‘A’ roads, and the term ‘classified roads’ refers to local authority ‘B’ and ‘C’ roads. Local authority ‘A’, ‘B’ and ‘C’ roads account for some 40 per cent of the local authority road network.

CSC

Characteristic SCRIM Coefficient. An estimate of the underlying skid resistance once the seasonal variation has been taken into account.

CVI

Coarse Visual Inspection – a method of inspecting road condition at network level developed as part of the UK Pavement Management System (see below). Fewer defect details are recorded than from a DVI (see below), but a CVI may be carried out either from a moving vehicle or as a walked survey. A CVI provides information on road condition at the local authority network level and identifies sections of road where a more detailed DVI survey may be required to more accurately determine the appropriate maintenance treatment.

DBFO

Design, build, finance and operate.

DVI

Detailed Visual Inspection – a method of inspecting road condition developed as part of the UK Pavement Management System (see below). A DVI is carried out by one or more inspectors walking along the road. The method is often used after initial problems have been noted during a CVI survey but some local authorities prefer to use walked DVI surveys, particularly where footway condition is important.

Footway

Any area alongside a road intended for use by pedestrians. (Colloquially a footway will be described either as a ‘pavement’ or as a footpath alongside a road.)

HAPMS

A generic term to cover the computer systems and related engineering and business processes that comprise the Highways Agency Pavement Management System.
Investigatory level: The level of condition at which consideration is given to the need for maintenance. At this juncture, all available evidence (e.g. accident rates) would be taken into account.

Local roads: Local authority maintained ‘A’, ‘B’, ‘C’ and unclassified roads. These are also known as non-trunk roads.

Mean Summer SCRIM coefficient: Mean of 3 or more SCRIM Coefficients measured for a length of road at well-spaced intervals between May and September in a year.

Motorway: A particular type of road with restricted use, carrying predominantly long-distance traffic. Most motorways are the responsibility of Highways England (formerly the Highways Agency) but there are some short lengths of local authority motorways.

Non-trunk roads: Local authority maintained ‘A’, ‘B’, ‘C’ and unclassified roads. These are also known as local roads.


Overlay: Material placed on top of the existing pavement in a layer (or layers) of regular thickness. This is a more substantial treatment than a surface dressing.

Pavement: Technical term for the surface of a road. Note this is not restricted to a footway (see definition above).

Principal roads: Local authority maintained ‘A’ roads and motorways. In general they carry less traffic than all-purpose trunk roads which are ‘A’ roads and motorways owned and maintained by central government.

RCE: Road Conditions in England – refers to this bulletin.

RCI: SCANNER Road Condition Index - indicates the condition of the road where a low score represents a road in ‘good’ condition whilst a high score represents a road that needs further investigation or where maintenance should be considered, as surveyed by SCANNER.

Reconstruction: The removal of some or all of the structural layers of a road pavement and their replacement with new material, including a new surfacing. This is a more substantial treatment than overlay.

Resurfacing: The removal and replacement of the existing surface, in order to restore the running surface and improve surface characteristics.

Rural roads: Roads that are not in settlements with a population of 10,000 or more.

SCANNER: Surface Condition Assessment of the National Network of Roads. Vehicle-mounted automated carriageway surface condition surveys for local authority roads, developed from the TRACS surveys used on the trunk road network. Like TRACS, the specification covers the requirements for both the machinery used and the survey process.
SCRIM  Sideway-force Coefficient Routine Investigation Machine – a lorry-based machine that when driven over a pavement surface, measures the resistance to skidding of the wet pavement surface.

Single annual SCRIM survey  All of lane 1 of the network is surveyed once during the SCRIM testing season in each year. In successive years, each road length is tested in the early, middle and late parts of the season.

Site (NRMCS)  100 metres of carriageway and associated footways and verges identified by DfT (for inspection by local authorities and - up to 2002 - by trunk road agents) to provide the visual condition for analysis by DfT. The sites are selected from a random sample of all roads (except motorways) in England and Wales. NRCMS surveys have not been carried out since 2006/07.

Standard axle  A single axle with 2 wheels and carrying a load of 80kN. The life of a pavement that will carry different axle types and loads is expressed in terms of the number of standard axles the pavement will carry.

Surface dressing  A single,double/triple layer of aggregate combined with one or more layers of binder (e.g. bitumen) to form a running surface. This may be laid over the existing surface.

Thin surfacing  Thin surfacing systems are machine-laid proprietary mixes of asphalt that have the capability to regulate the surface profile of a road pavement, restoring surface texture and skid resistance. They have thicknesses up to 40 mm.

TRACS  Traffic Speed Condition Survey – a label to describe a methodology for Highways England’s machine-based surveys of surface condition, including cracking and rutting, of the trunk road network in England. The TRACS specification covers the requirements for both the machinery used and the survey process.

Trunk roads  Motorways and all-purpose trunk roads owned by central government and for which Highways England (in England) and the Welsh Government (in Wales) have responsibility for maintenance and operation. These are strategic roads with a high proportion of long-distance traffic although some trunk roads may also have lengths, with the same number, designated as an ‘A’ principal road, where traffic is predominantly local in nature.

TTS  TRACS type surveys.
### UKPMS
United Kingdom Pavement Management System – this is a standard logical design for software used by local highway authorities for the management of the maintenance of their road networks. A number of companies market software that meets the UKPMS requirements. Associated with UKPMS are standard survey types (CVI and DVI surveys, see above) and standard ‘rules and parameters’ to be used when processing survey data for ‘national’ purposes e.g. for Best Value Performance Indicators.

### Unclassified roads
Minor roads which are not designated as classified roads and which are owned and maintained by a local highway authority. By length, some 60 per cent of the local authority network is unclassified.

### Urban roads
Roads in settlements with a population of 10,000 or more.