



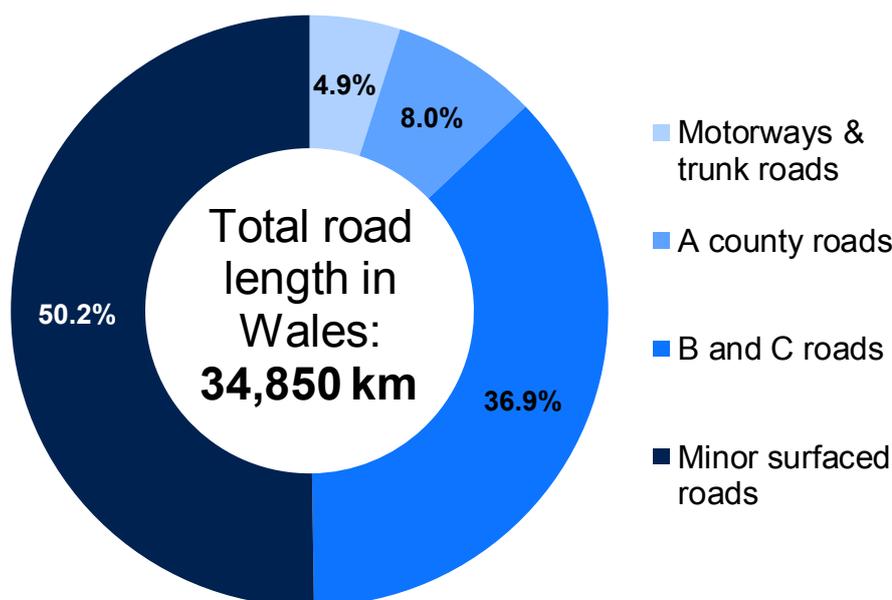
## Road Lengths and Conditions, 2018-19

10 July 2019  
SB 26/2019

### Key points

- The total road length in Wales in 2018-19 was approximately 34,850 km, an increase of 0.2% on the year before.
- Powys contains the largest road network of the Welsh local authorities. It has the highest proportion of all trunk roads (27.3%), B and C roads (21.1%) and minor surfaced roads (12.1%) and accounts for 15.8% of the total road length of Wales.
- In 2018-19, 6.4% of the motorway network and 2.8% of the trunk road network required close monitoring of structural condition, this compares to 4.9% and 1.8% respectively in 2017-18.
- During 2017-18, the Vale of Glamorgan had the highest percentage of A county roads in poor condition (6.5%), Merthyr Tydfil had the highest percentage of B roads in poor condition (7.5%) and Powys had the highest percentage of C roads in poor condition (23.0%).

**Chart 1: Total road length in Wales by road classification, 2018-19**



### About this bulletin

This annual Statistical Bulletin presents information about the length and condition of roads in Wales and includes data up to the financial year 2018-19. Data from this bulletin, and historical data, can be found on [StatsWales](https://stats.wales.gov.uk/).

### Definitions

Definitions of road classifications can be found in the supplementary information section.

### In this bulletin

<a href="#">Introduction</a>	2
<a href="#">Road lengths</a>	2
<a href="#">Local authority road conditions</a>	4
<a href="#">Structural condition</a>	5
<a href="#">Skidding resistance</a>	6
<a href="#">Potholes</a>	7
<a href="#">Links to data</a>	8
<a href="#">Supplementary information</a>	9
<a href="#">Key quality information</a>	13

## Introduction

There are six classifications for surfaced roads in Wales: motorways, A trunk roads, A county roads, B roads, C roads and minor surfaced roads. The Welsh Government is the highway authority for motorways and trunk roads, while A county, B, C and minor surfaced roads are the responsibility of local authorities.

## Road lengths

Total road lengths in Wales change relatively little from year to year. The motorway and trunk road networks are the shortest, at 135 km and 1,576 km respectively, and have remained at broadly the same levels since 1997 (the full dataset is available on StatsWales, linked in the [data tables](#) section). The last increase in the motorway network occurred when the second Severn Crossing was opened during 1996-97, though the estimate increased slightly in 2018-19 due to improved methodology (see [key quality information, motorway lengths](#) for further details). Compared with 1995-96, before the second Severn Crossing was opened, the Welsh road network has increased by 686 km (2.0%).

Motorway and trunk roads make up less than 5% of the total road length in Wales, but since they account for [over 38% of the total volume of traffic](#), their importance to the Welsh economy and Welsh life is significant. In 2018 the volume of traffic on these roads was over 11 billion vehicle kilometres (3.76 billion on the motorway and 7.59 billion on trunk roads).

At a local authority level, Powys has the longest road network with 5,508 km of road, followed by Carmarthenshire with 3,634 km. The bulk of the networks in these two authorities are minor roads (categories B, C and minor surfaced). Newport has the longest stretch of motorway (26 km), which accounts for 19.2% of the total motorway in Wales.

**Table 1: Road length by class and local authority 2018-19 <sup>(a)</sup>**

Local Authority	Kilometres					
	Motorway	A Trunk	A county	B and C	Minor surfaced	All roads
Isle of Anglesey	0	36	146	484	558	1,224
Gwynedd	0	217	331	1,065	1,322	2,934
Conwy	0	124	117	661	787	1,689
Denbighshire	0	72	140	655	623	1,491
Flintshire	0	48	152	341	682	1,223
Wrexham	0	31	110	513	519	1,173
Powys	0	430	243	2,708	2,127	5,508
Ceredigion	0	114	158	1,167	826	2,265
Pembrokeshire	0	120	160	1,221	1,096	2,597
Carmarthenshire	5	147	250	1,615	1,617	3,634
Swansea	15	0	102	231	775	1,124
Neath Port Talbot	19	25	118	116	598	876
Bridgend	18	0	104	139	542	803
Vale of Glamorgan	4	0	74	369	592	1,039
Rhondda Cynon Taf	10	29	165	200	925	1,328
Merthyr Tydfil	0	37	28	51	222	337
Caerphilly	0	5	97	217	858	1,176
Blaenau Gwent	0	10	51	68	390	518
Torfaen	0	14	26	102	315	456
Monmouthshire	22	102	59	612	839	1,633
Newport	26	9	51	189	415	690
Cardiff	17	8	92	138	882	1,137
<b>Wales</b>	<b>135</b>	<b>1,576</b>	<b>2,773</b>	<b>12,861</b>	<b>17,509</b>	<b>34,853</b>

Source: Welsh Government

(a) At 1 April of each year. Excludes trunk slip and link roads. The introduction of Geographic Information Systems in some local authorities has resulted in significant revisions to figures for some road classes in recent years. Figures may not match totals due to rounding.

## Local authority road conditions

Local authorities are responsible for A county roads, B and C roads and minor surfaced roads that they have adopted. These roads account for over 33,000 km (approximately 95%) of the road network in Wales.

In 2017-18, the Vale of Glamorgan had the highest proportion of A county roads in poor condition (6.5%), followed by Pembrokeshire (5.4%). Merthyr Tydfil had the highest percentage of B roads in poor condition (7.5%), followed by Rhondda Cynon Taf (6.2%). For C roads, Powys had the highest proportion in poor condition (23.0%) followed by Ceredigion (17.5%). This bulletin will be updated in August 2019 with local authority data to 2018-19.

**Table 2: Percentage of Local Authority managed road network in poor condition, 2017-18** <sup>(a)(b)</sup>

Local Authority	Per cent		
	A county	B roads	C roads
Isle of Anglesey	2.9	4.2	8.9
Gwynedd	3.2	3.8	14.1
Conwy	3.5	4.3	14.4
Denbighshire	2.7	5.1	10.2
Flintshire	1.4	1.3	5.3
Wrexham	2.4	2.4	16.3
Powys	3.9	5.7	23.0
Ceredigion	4.4	3.1	17.5
Pembrokeshire	5.4	5.2	7.2
Carmarthenshire	4.1	3.1	11.9
Swansea	3.2	4.5	6.7
Neath Port Talbot	4.5	2.9	5.3
Bridgend	4.5	4.2	8.6
Vale of Glamorgan	6.5	4.2	10.5
Rhondda Cynon Taf	5.2	6.2	6.2
Merthyr Tydfil	3.3	7.5	4.1
Caerphilly	4.6	3.6	7.3
Blaenau Gwent	2.6	5.6	6.1
Torfaen	2.1	4.3	5.3
Monmouthshire	2.4	4.9	7.7
Newport	2.6	4.4	7.1
Cardiff	3.3	5.6	6.0
<b>Wales</b>	<b>3.7</b>	<b>4.3</b>	<b>14.1</b>

Source: Data Cymru, Local authority roads in poor condition

(a) Data for 2018-19 are due to be published later in July 2019. This bulletin will then be updated.

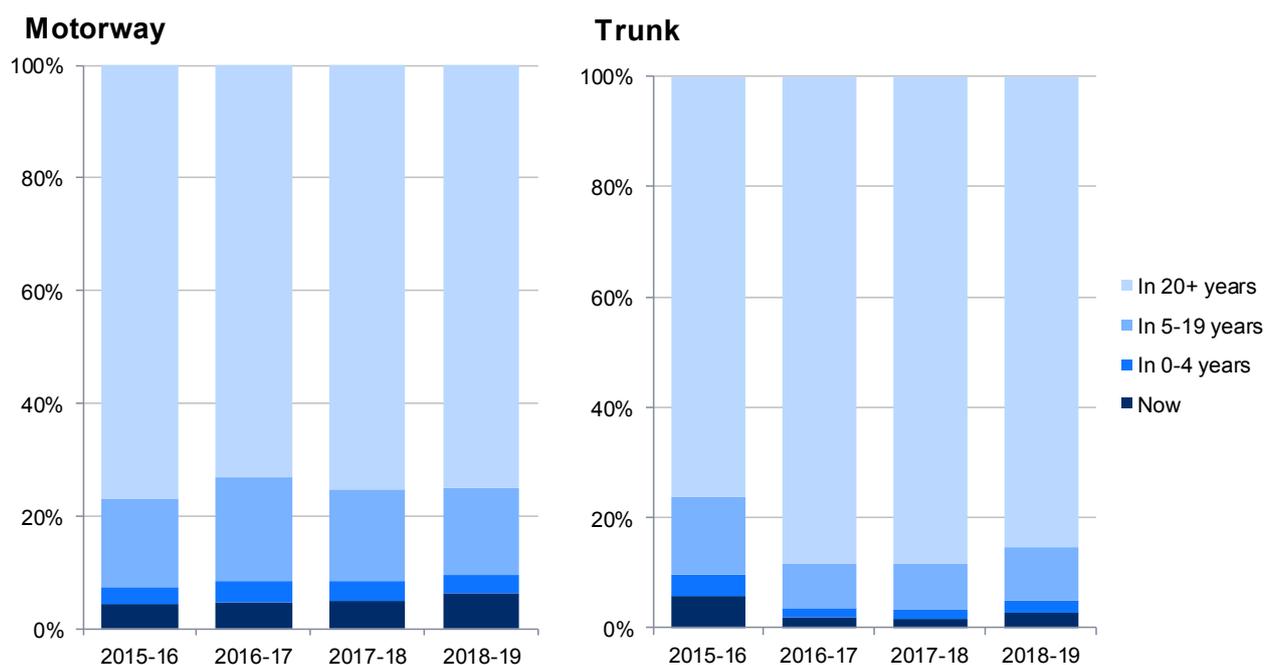
(b) Based on inspection of the road surface using machine based SCANNER surveys. The figures for this indicator represent the percentage of the road network length that is equal to or above the RED threshold, i.e. in poor overall condition.

## Structural condition of motorways and A trunk roads

This section deals with the condition of the road network, which is surveyed each year to ascertain its state of repair in terms of its structural condition. The survey showed that 6.4% of the motorway and 2.8% of the trunk road network is currently in need of close monitoring. The survey also showed that in the next 4 years, 3.1% of the motorway and 2.3% of trunk roads will be in need of close monitoring. The majority of the network is currently in good condition and it is estimated that 75% of the motorway and 85% of trunk roads will not be in need of close monitoring for at least 20 years. In recent years the overall condition of motorways appears to be fairly static, while for A Trunk roads there has also been little change for the last three years after an improvement in 2016-17.

One factor that affects the condition of roads is the [volume of traffic](#) and in recent years it has increased in line with the economic recovery. In 2018, the traffic volume was 3.76 billion vehicle kilometres on the motorway, and 7.59 billion vehicle kilometres on trunk roads. Traffic per length of road is far higher on motorways when compared with trunk roads, county roads and minor roads.

**Chart 2: Proportion of motorway and trunk roads in Wales requiring close monitoring of structural condition, 2015-16 to 2018-19 <sup>(a)</sup>**



Source: Welsh Government

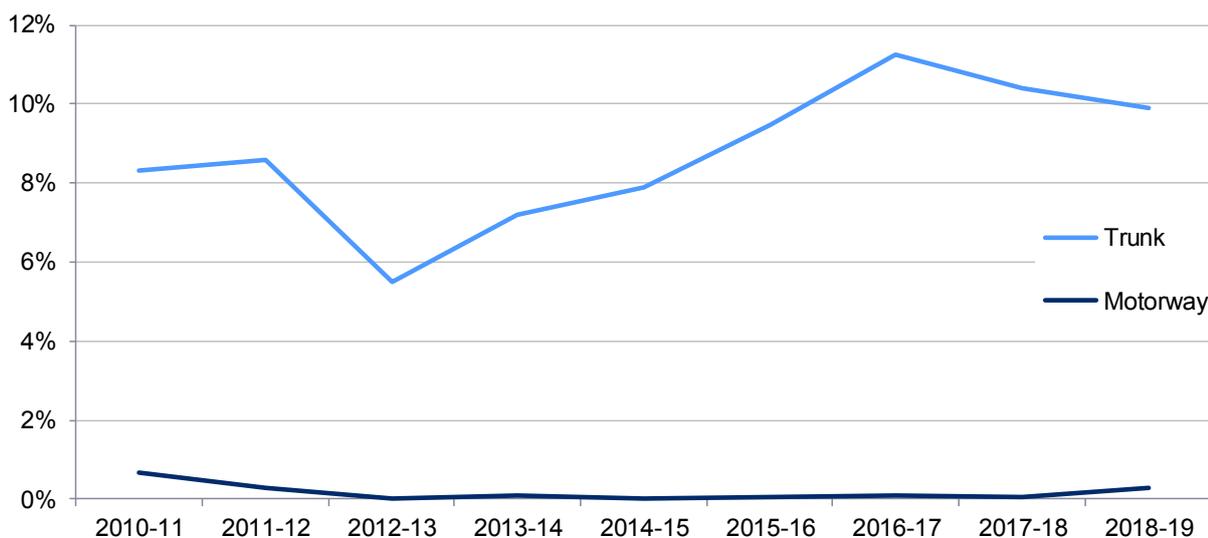
(a) Based on results of Deflectograph survey (see [methodology section](#) for more information). The structural condition of a section of road is in need of close monitoring when it has a negative residual life. Excludes concrete pavements and elevated carriageways.

## Skidding resistance of motorways and A trunk roads

Skidding resistance relates to wet or damp road surfaces. It reflects the condition of the road surface by measuring resistance between vehicles' tyres and the road when accelerating, breaking or cornering. Testing takes place on wet surfaces as road surfaces exhibit least friction and skid resistance when wet. 100% of motorway surfaces and 95 per cent of A Trunk road surfaces were surveyed in 2018-19. Some testing of dry road surfaces does take place from time to time, however it does not form any part of the routine skid resistance monitoring that takes place on the road network. It is assumed that in dry conditions all clean road surfaces have a high skidding resistance.

The skidding resistance of the M4 is of a high standard, with 0.3% of the surveyed surface found to be at or below investigatory level in 2018-19. Since the series began in 1999, the proportion at or below investigatory level has been 0.7% or lower. For the trunk road network, 9.9% of the surveyed surface was found to be at or below investigatory level in 2018-19, down from 10.4% in the previous year.

**Chart 3: Proportion of motorway and trunk roads in Wales surveyed at or below investigatory level for skidding resistance, 2010-11 to 2018-19<sup>(a)</sup>**



Source: Welsh Government

(a) Based on results of SCRIM survey (see [methodology section](#) for more information). 'At or below investigatory level' does not mean the roads are unsafe; it indicates a need for further investigation to determine the need for maintenance of that section of road.

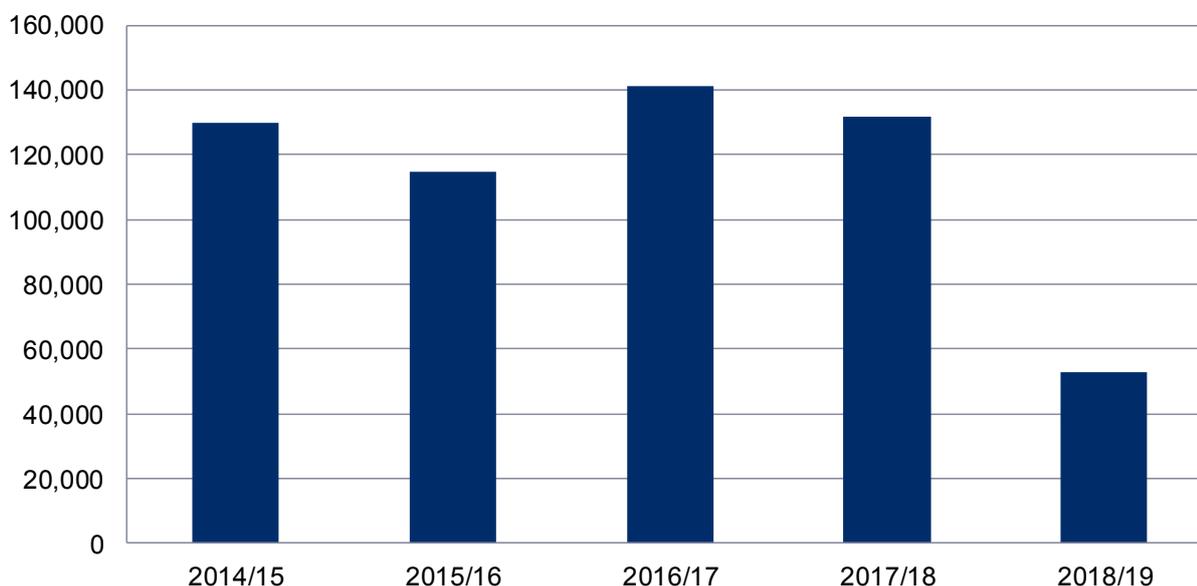
## Potholes

Potholes are a feature of poor road conditions and can cause significant damage to vehicles. There are no official data sources on potholes in the UK and therefore the information included in this section is not classed as a National Statistic, but is included to provide more context on road conditions in Wales.

The Asphalt Industry Alliance (AIA) collects information from local authorities on the number of potholes filled each year. We might expect the number of potholes *repaired* to track the number of potholes there *actually are*, but this is not necessarily the case on a consistent basis. For example, the number of potholes on the roads can be affected by factors like weather and traffic volume, but the number repaired in a particular year may reflect the resources available to deal with them. The estimates of potholes filled in Wales are grossed up based on which local authorities responded – in 2018/19, 10 of the 22 local authorities responded to the AIA survey.

The AIA estimates that 52,700 potholes were filled by local authorities in Wales in 2018/19, down by more than 50% compared with the previous year and the lowest in the available series. There is a significant amount of variation in the annual figures. This may to some extent reflect the variable samples achieved in the survey from year to year as well as genuine changes in the number of potholes repaired.

**Chart 4: Number of potholes filled each year in Wales, 2014/15-2018/19**



Source: Asphalt Industry Alliance ALARM survey

## Links to data

Data in this bulletin

<a href="#">Road length by road class in Wales</a>	
<a href="#">Road length by road class and local authority</a>	
<a href="#">Local authority road conditions (StatsWales)</a>	
<a href="#">Local authority road conditions (Data Cymru)</a>	
<a href="#">Structural condition of motorway and trunk roads</a>	
<a href="#">Skidding resistance of motorway and trunk roads</a>	
<a href="#">Volume of road traffic by road class</a>	

## Related publications

<a href="#">Road traffic, Welsh Government</a>	
<a href="#">Road network size and condition, Department for Transport (DfT)</a>	
<a href="#">Annual Local Authority Road Maintenance Survey (ALARM), Asphalt Industry Alliance (AIA)</a>	

# Supplementary information

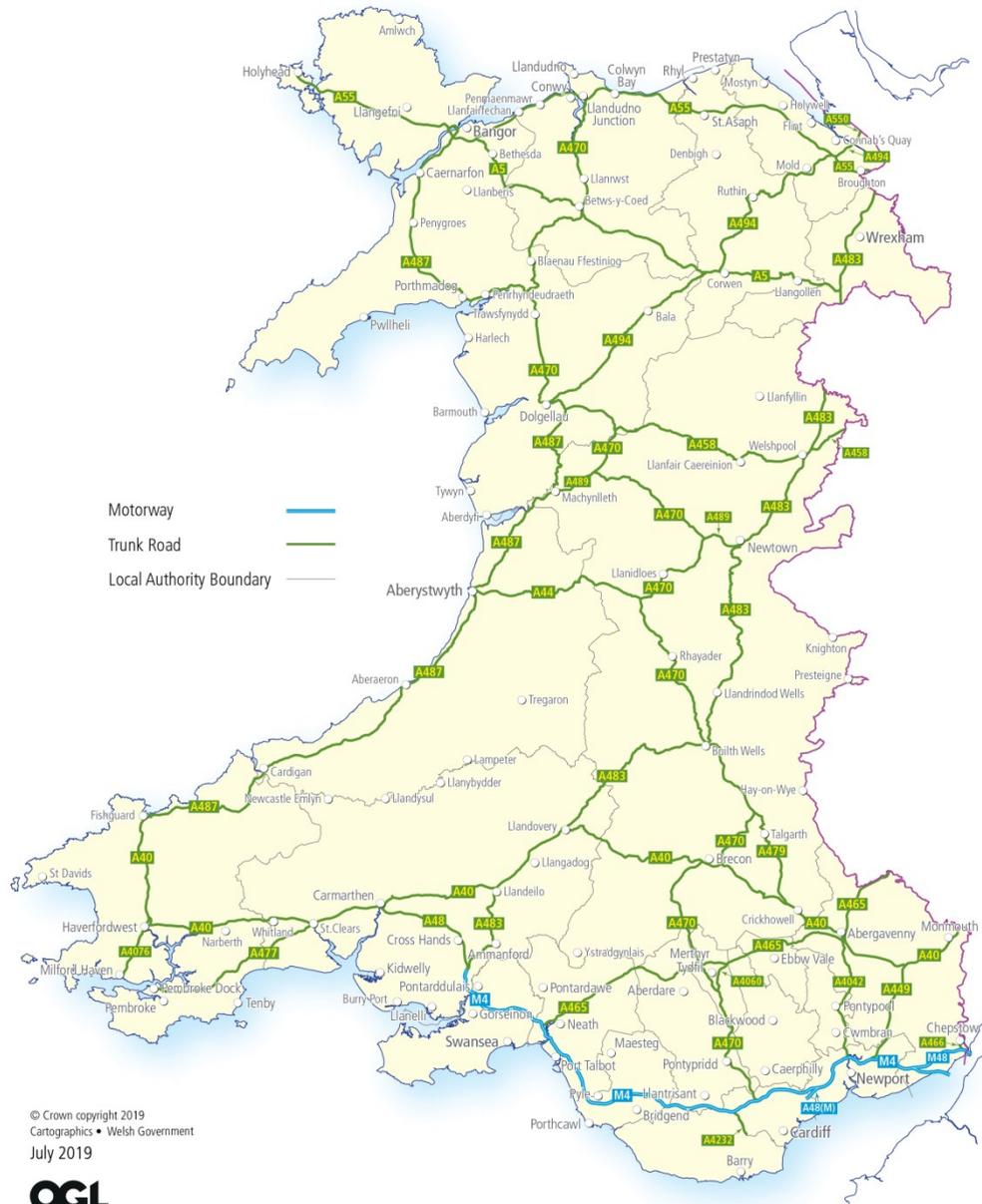
## Definitions

Motorway: Roads identified as M on road signs and which are reserved for use by certain types of traffic only. The A48(M) is included in this group.

Trunk roads: Trunk roads comprise the national network of strategic routes which cater for the through movement of long distance traffic for which the Welsh Government is the highway authority. The network comprises some of the all-purpose roads (A roads), which are open for use by all classes of traffic, and special roads such as motorways (which are separately identified in the tables). For all other public roads the local authorities are the highway authorities. The map on the next page displays the trunk road network in Wales.

# WALES

## TRUNK ROAD NETWORK



A county roads: Also known as Principal classified roads. Roads of regional and urban strategic importance.

B and C roads: Also known as Non-principal classified roads. These distribute traffic to urban and rural localities.

Minor surfaced roads: Also known as Unclassified. These are local distributor and access roads.

## **Data sources**

### **Road lengths**

Most of the data on road lengths are submitted annually to the Welsh Government by each of the 22 Welsh local authorities. These lengths are calculated using the [National Street Gazetteer \(NSG\)](#) which is regularly updated by all highway authorities. Data as at 1 April of a given year are used for the financial year that concluded on the previous day.

Motorway lengths are provided by the Welsh Government's Network Management Division. The Welsh Government Integrated Road Information system (IRIS) holds the maintained trunk road network as a series of links and sections; each section has the length as an attribute. The section lengths have either been physically measured or derived electronically. Where motorway exists in Wales outside the maintenance responsibility of the Welsh Government these lengths have been measured electronically from digital mapping. Data as at 1 April of a given year are used for the financial year that concluded on the previous day.

### **Road conditions**

Local authority road condition data on A, B and C roads are based on the performance indicator data for local authorities in Wales, compiled by Data Cymru. Data are collected using the SCANNER method outlined below and relate to surveys carried out in the financial year.

Structural conditions of motorways and A trunk roads are provided by Welsh Government's Network Management Division. The estimates of structural road condition are derived from the National Roads Maintenance Condition Survey (NRMCS). Data are collected using the Deflectograph method outlined below and relate to surveys carried out in the financial year.

Skidding resistance of motorways and A trunk roads are provided by Welsh Government's Network Management Division. Data are collected using the SCRIM method outlined below and relate to surveys carried out in the financial year.

Potholes data are collected by the Asphalt Industry Alliance (AIA) through an independent survey of local authority highway departments in England and Wales, known as the Annual Local Authority Road Maintenance Survey (ALARM). Data used within this bulletin are based on the number of potholes filled and relate to the financial year.

## Methodology

More information can be found in the [technical note](#) published by the Department for Transport (DfT).

### Local Authority road conditions – SCANNER survey

SCANNER (Surface Condition Assessment for the National Network of Roads) data are collected using vehicles fitted with automated road condition survey machines. The Road Condition Indicator (RCI) is then calculated using various parameters: rut depth, 'bumpiness', texture and cracking of the road surface.

Figures for the percentage of roads in poor condition represents the percentage of the road network length that is equal to or above the RED threshold i.e. that is in poor overall condition and will require planned maintenance soon i.e. within a year or so on a 'worst first' basis.

Local authorities are advised to aim to have surveys carried out at approximately the same time each year, to minimise variations due to seasonal effects and the impact of the works programme.

Local authorities should insist that survey contractors fully comply with the requirements of the SCANNER quality assurance and auditing procedures that form part of the SCANNER specification.

Only data collected using survey equipment possessing a valid SCANNER Acceptance Certificate, which explicitly states that the survey vehicle has been approved for use in the production of Best Value Performance Indicators, may be used in the calculation of this measure.

The following provisions apply for the programming and reporting of SCANNER surveys:

- The surveys must be SCANNER accredited surveys and a UKPMS accredited pavement management system used to produce the report.
- All road surface types are included.

Targets:

- A and B roads: 100% of the surveyable network to be surveyed in one direction or 50% in both directions. The measure must be derived from surveys covering a minimum of 90% of the 'possible survey lane length' over the last two financial years.
- C roads: 50% of the surveyable network to be surveyed in one direction or 25% in both directions. The measure must be derived from surveys covering a minimum of 80% of the 'possible survey lane length' over the last four financial years.
- 'Possible survey lane length' is as defined in the [UKPMS Technical Note 43](#).

## **Structural conditions of motorways and A trunk roads – Deflectograph survey**

A Deflectograph is used to assess the structural condition of flexible road surfaces. It works on the principle that as a loaded wheel passes over the road surface, the road surface deflects and the size of the deflection is related to the strength of the road surface layers and subgrade.

The assessment procedure used depends on the type and its mode of deterioration. Some thick well-constructed flexible road surfaces with asphalt base have been found not to deteriorate in the conventional way and with timely attention to surface defects can have a long but indeterminate life.

The Deflectograph measures the amount a flexible or flexible-composite road surface bends under the weight of a standard axle. This information is integrated with details of the road surface construction and present and future traffic flows to determine the residual life of the road surface and the recommended overlay.

Deflectograph surveys are undertaken annually on the Welsh Government trunk road network and are conducted in March through to mid-June and mid-September to the end of October.

## **Skidding resistance of motorways and A trunk roads – SCRIM survey**

Skid 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. It is generally measured after the road has been wetted and data can be collected in various ways.

The method most widely used on roads is the Sideway-force Coefficient Routine Investigation Machine (SCRIM). This is a water tanker with a test wheel mounted at 20 degrees to the direction of travel. The test wheel is free to rotate and is subject to a 200 kilogram vertical load. Water is sprayed onto the road surface immediately in front of the test wheel, which is permanently in a controlled-skid condition, and the frictional force developed perpendicular to the plane of the test wheel is measured.

On trunk roads, the whole length of Lane 1 is surveyed each year, this being the lane that carries the majority of heavy vehicles. Skid resistance is measured in both directions for two-way carriageway. Slip roads and roundabouts are included. Exceptions can occur where testing speeds or conditions invalidate data and are not included in the measurement.

The skidding resistance of road surfaces has been shown to vary during the year. In the winter the action of the weather and gritting results in an increase in skidding resistance. Trafficking and drier weather during the summer serves to polish the surface and reduce the measured skid resistance. Therefore the measurements obtained can be dependent on the time of year that the survey was carried out. To reduce the effect of seasonal variation the testing season is restricted to 1st May to 30th September.

## Key quality information

This section provides a summary of information on this output against five dimensions of quality: Relevance, Accuracy, Timeliness and Punctuality, Accessibility and Clarity, and Comparability.

### Relevance

The statistics are used both within and outside the Welsh Government to monitor trends road lengths and conditions and in Standard Spending Assessment (SSA) calculations, which are used to distribute funding to local authorities.

### Accuracy

See section on methodology above.

### Timeliness and punctuality

The statistics on road lengths and conditions relate to data obtained for the financial year 2018-19. Statistics on local authority road conditions relate to data for the financial year 2017-18 due to data not yet being available. Data for 2018-19 is due to be [published by Data Cymru](#) later this month and will then be updated.

### Accessibility and clarity

This statistical bulletin is pre-announced and then published on the [Statistics for Wales website](#) and is accompanied by tables on our [StatsWales website](#).

### Comparability and coherence

#### Motorway lengths

There were no real changes to motorway lengths in 2018-19 but the estimate changed slightly because of improved methodology. The majority of local authorities have only had minor changes to the motorway lengths (plus or minus a maximum of 0.2 km) resulting in a combined increase of 0.3 km overall.

The two exceptions are the increases in Monmouthshire and Newport (0.8 km and 0.7 km respectively). These are due to the inclusion of sections of road previously interpreted as slip road; where the M48 joins the M4 in Monmouthshire and where the A48(M) joins the M4 in Newport. These joining lengths are regarded as motorway not slip road because vehicles do not exit one road to join the other, they simply merge together.

#### Local authority road conditions

In previous publications, the road condition for each local authority has been reported as a single figure relating to the percentage of the whole local authority managed road network in poor condition. The data are now reported separated by road class to give a more accurate representation of the performance of each local authority. This is because C roads are generally in poorer condition than A or B roads, therefore local authorities containing a higher proportion of C roads had a much higher proportion of roads in poor condition.

## **Deflectograph surveys**

In past years there have been two main methods of processing Deflectograph data. The Welsh Government made use of the Deflec method for all of surveys up to 2014-15. Since 2015-16, the Welsh Government has used the Pandef method of processing.

This results in a discontinuity in the data between 2014-15 and 2015-16. However, this change in software aligns the Welsh Government with the methods used by the rest of the UK, including Highways England and Transport Scotland.

## **SCRIM surveys**

As a result of this variation in the skidding properties, until 2005, SCRIM surveys of the trunk road network were carried out on one third of the network each year, with each length surveyed three times in the year (at the start, middle and end of the SCRIM survey season).

However, there was a change in approach to the surveying of trunk roads from 2005, such that skidding resistance measurements are now undertaken each year under a single annual survey regime. The surveys are scheduled such that, over a three year period, the network is surveyed early, middle and late in the test season in successive years, i.e. a length that was surveyed early in the first year will be surveyed in the middle of the season in the second year and then late in the season in the third year.

Highways England (formerly the Highways Agency) has implemented an annual correlation trial for SCRIM survey vehicles, which are currently carried out by TRL. All SCRIM vehicles undertaking surveys on trunk roads are required to pass the trial in order to undertake surveys on the trunk road network. Other SCRIM survey operators are also able to attend the trials, although it is not compulsory. However, local authorities commissioning SCRIM surveys typically expect that the SCRIM vehicles used on their network will have passed the trials, and therefore in practice it has been found that all SCRIM vehicles operating in the UK attend the trials. In the trials the SCRIM vehicles are required to undertake surveys on a number of sites having different levels of skid resistance and the data is compared to identify outliers. The trials therefore aim to ensure consistency across the fleet of vehicles operating in the UK.

## **National Statistics status**

The [United Kingdom Statistics Authority](#) has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the [Code of Practice for Statistics](#).

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Statistics. They are awarded National Statistics status following an assessment by the UK Statistics Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate. The designation of these statistics as National Statistics was confirmed in February 2011 [following a full assessment against the Code of Practice](#).

Since the latest review by the Office for Statistics Regulation, we have continued to comply with the Code of Practice for Statistics, and have made the following improvements:

- Added to and refined information about dimensions of quality and described links to policy.
- Improved our understanding of the various data sources and the methodology behind them, including their strengths and limitations.
- Added new relevant data sources to provide a broader view of the topic.
- Improved visuals by de-cluttering and standardising charts and tables.

It is Welsh Government's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

## **Well-being of Future Generations Act (WFG)**

The Well-being of Future Generations Act 2015 is about improving the social, economic, environmental and cultural well-being of Wales. The Act puts in place seven well-being goals for Wales. These are for a more equal, prosperous, resilient, healthier and globally responsible Wales, with cohesive communities and a vibrant culture and thriving Welsh language. Under section (10)(1) of the Act, the Welsh Ministers must (a) publish indicators ("national indicators") that must be applied for the purpose of measuring progress towards the achievement of the Well-being goals, and (b) lay a copy of the national indicators before the National Assembly. The 46 national indicators were laid in March 2016.

Information on the indicators, along with narratives for each of the well-being goals and associated technical information is available in the [Well-being of Wales report](#).

Further information on the [Well-being of Future Generations \(Wales\) Act 2015](#).

The statistics included in this release could also provide supporting narrative to the national indicators and be used by public services boards in relation to their local well-being assessments and local well-being plans.

## **Further details**

This document is available at: <https://gov.wales/road-lengths-and-conditions>

## **Next update**

July 2020 (provisional)

## **We want your feedback**

We welcome any feedback on any aspect of these statistics which can be provided by email to [stats.transport@gov.wales](mailto:stats.transport@gov.wales).

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