



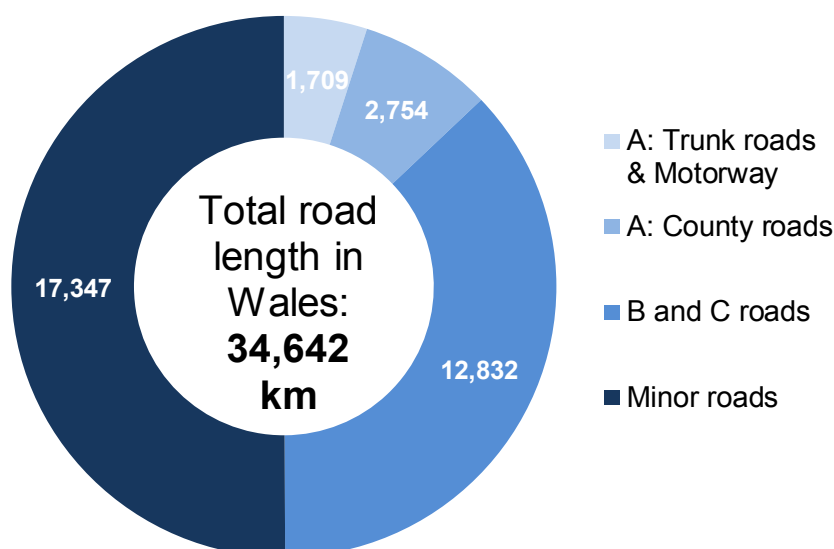
Road Lengths and Conditions, 2015-16

8 February 2017
SB 9/2017

Key points

- The total road length in Wales in 2015-16 was 34,642 km ([table 1](#)).
- Minor surfaced roads contribute approximately half the total road length in Wales ([table 1](#)).
- Powys covers the largest land area of the Welsh local authorities. It accounts for the highest proportion of all A Trunk roads (27 per cent), B and C roads (21 per cent) and minor surfaced roads (12 per cent), resulting in an overall 16 per cent of the total road length of Wales ([table 2](#)).
- The Local Authority containing the longest stretch of motorway is Newport, which accounts for 19 per cent of the total motorway in Wales ([table 2](#)).
- In 2015-16, 4.3 per cent of the motorway network and 5.7 per cent of the trunk road network required close monitoring of structural condition, a break in the series due to methodology changes makes this figure incomparable with previous years' surveys ([table 4](#)).
- During 2015-16 Powys had the highest proportion of road network in need of further investigation due to its condition, 20 per cent ([table 6](#)).

Chart 1: Total Road length in Wales by road classification, 2015-16



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 2015-16. Data from this bulletin, and historical data, can be found on Stats Wales.

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Introduction

The Motorway and Trunk Roads are the main transport arteries in Wales and they carry the highest volume of traffic per vehicle kilometre. The Welsh Government is the highway authority for the motorway and the trunk road network, whilst all other public highways are the responsibility of the local authority they're within.

Road lengths

This section deals with the road lengths within Wales for all class of roads. The Motorway and Trunk road network are the shortest at 133km and 1,576km and has remained broadly at the same level since 1997. The last increase in the motorway network occurred when the second Severn Crossing was opened during 1996-97. Their importance to the Welsh economy is illustrated by the volume of traffic. In 2015 the volume of traffic on these roads was over 10bn vehicle kilometres (3.68 billion on the motorway and nearly 7 billion on the Trunk roads)¹. Overall since 1996 the length of the Welsh road network has increased by over 400 kilometres, an increase of just over 1 per cent.

At a local authority level, Powys has the longest road network with 5,500km of road, followed by Carmarthenshire at 3,495km. The bulk of the networks in these two authorities are minor roads (categories B, C and minor surfaced). Newport and Monmouthshire, account for just over a third of the motorway network whilst in North Wales, Gwynedd has the largest Trunk road network at 217km ([table 2](#)).

The dual carriageway network makes up just over 1 per cent of the total road network and Flintshire has the greatest length at 58km. This is 11 per cent of the total dual carriageway in Wales ([table 3](#)).

Table 1: Road length by road class in Wales, 2015-16 (a)

		<i>Kilometres</i>					
		A: Trunk (c)					
	Total	Motorway	Total	of which: dual carriageway	A: County	B and C	Minor surfaced
2015-16	34,642	133	1,576	350	2,754	12,832	17,347

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. The 1999 review of the form collecting road lengths also had an effect on the 1999 figures by clarifying definitions.

¹ From the Road traffic during 2015 release, which can be found here: <http://gov.wales/statistics-and-research/road-traffic/?lang=en>

Table 2: Road length by class and local authority 2015-16(a)

Kilometres

Local Authority	Motorway	A: Trunk (excluding motorway)		A: County		B and C		Minor surfaced		Total	
		Total	of which built-up (b)	Total	of which built-up (b)	Total	of which built-up (b)	Total	of which built-up (b)	All Roads Total	of which built-up (b)
Isle of Anglesey	0	36	2	145	28	483	59	553	176	1,218	264
Gwynedd	0	217	14	331	72	1,065	104	1,320	345	2,932	534
Conwy	0	124	19	118	52	658	113	785	405	1,685	589
Denbighshire	0	72	7	140	30	655	50	621	219	1,488	306
Flintshire	0	48	2	152	64	341	111	673	419	1,213	596
Wrexham	0	31	1	110	31	513	126	515	293	1,168	451
Powys	0	431	40	238	30	2,706	112	2,126	217	5,501	400
Ceredigion	0	114	30	158	34	1,166	100	824	123	2,262	288
Pembrokeshire	0	120	20	160	53	1,220	164	1,085	308	2,585	545
Carmarthenshire	5	147	20	249	90	1,603	190	1,603	397	3,601	697
Swansea	15	0	0	102	63	230	115	773	631	1,105	809
Neath Port Talbot	19	25	0	118	66	116	69	593	473	852	609
Bridgend	18	0	0	104	52	139	83	536	434	779	569
Vale of Glamorgan	4	0	0	74	21	369	54	592	373	1,035	448
Cardiff	17	8	0	86	52	138	96	877	866	1,109	1,014
Rhondda Cynon Taf	10	29	0	165	76	200	128	917	781	1,311	985
Merthyr Tydfil	0	37	0	28	22	47	35	222	192	333	249
Caerphilly	0	5	0	97	30	216	129	852	689	1,169	848
Blaenau Gwent	0	10	0	43	24	68	51	317	316	438	391
Torfaen	0	14	1	26	16	102	71	312	278	453	367
Monmouthshire	22	102	5	59	15	609	64	839	190	1,609	274
Newport	25	9	0	51	29	189	72	415	347	664	448
Wales	133	1,576	163	2,754	952	12,832	2,095	17,347	8,470	34,509	11,680

(a) At 1 April. Excludes trunk slip and link roads. Figures may not match totals due to rounding.

Source: Welsh Government

(b) Roads with a speed limit of 40 mph or less. Previously referred to as 'urban'. Includes (h) and Motorway and A Trunk roads

Table 3: A road lengths, by road type and local authority, 2015-16 (a)

Kilometres

Local Authority	A: Trunk (excluding motorway)				A: County			
	Single carriageway		Dual carriageway		Single carriageway		Dual carriageway	
	Built-up (b)	Non built-up	Built-up (b)	Non built-up	Built-up (b)	Non built-up	Built-up (b)	Non built-up
Isle of Anglesey	2	2	0	33	28	117	0	0
Gwynedd	14	187	0	16	72	259	0	1
Conwy	19	71	0	34	44	66	9	2
Denbighshire	7	50	0	15	30	105	0	3
Flintshire	2	8	0	37	61	70	3	18
Wrexham	1	11	0	19	28	72	3	8
Powys	40	383	0	7	30	208	0	0
Ceredigion	30	83	0	0	34	124	0	0
Pembrokeshire	19	99	1	1	53	107	0	0
Carmarthenshire	20	80	1	47	87	158	3	1
Swansea	0	0	0	0	45	34	18	5
Neath Port Talbot	0	0	0	25	59	42	7	10
Bridgend	0	0	0	0	50	35	3	17
Vale of Glamorgan	0	0	0	0	21	49	1	4
Cardiff	0	2	0	7	44	8	8	25
Rhondda Cynon Taf	0	7	0	22	73	82	3	7
Merthyr Tydfil	0	17	0	19	21	5	1	0
Caerphilly	0	0	0	5	29	49	1	17
Blaenau Gwent	0	10	0	0	24	18	0	0
Torfaen	0	0	1	13	14	9	2	1
Monmouthshire	5	53	0	43	15	43	0	1
Newport	0	2	0	7	21	7	9	15
Wales	159	1,067	3	347	882	1,668	70	135

(a) At 1 April. Excludes trunk slip and link roads. Figures may not match totals due to rounding.

Source: Welsh Government

(d) Roads with a speed limit of 40 mph or less. Previously referred to as 'urban'.

Road conditions in Wales

Structural condition

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. Using the new methodology, see methodology section for more details, 4.3 per cent of the motorway and 5.7 per cent of the trunk road network is currently in need of close monitoring. The survey also estimated that in the next 4 years, an additional 3 per cent of the motorway and 3.9 per cent 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 76.8 per cent will not be in need of close monitoring until 20 or more years.

One factor that affects the condition of the network is the volume of road traffic and in recent years this volume has increased in line with the economic recovery. In 2015, the volume of traffic on the motorway was almost 13 per cent higher than in 2010. (3.68bn vehicle kilometres in 2015 compared to 3.26bn vehicle kilometres). The volume of traffic on the trunk road network also increased but only by 5.7 percent. (6.91bn vehicle kilometres in 2015 compared to 6.54bn vehicle kilometres).

Table 4: Road condition: Motorway and A trunk road network requiring close monitoring of structural condition, Wales, 2015-16 (a)

Road Class	Percentage of network surveyed (c)	Percentage of network requiring close monitoring (b)				<i>Per cent</i>
		Now	In 0-4 years	In 5-19 years	In 20 or more years	
Motorway						
2015-16 (d)	87	4.3	3.0	15.9	76.8	
A Trunk						
2015-16 (d)	93	5.7	3.9	14.2	76.2	

Source: Welsh Government

(a) Calculated using Deflectograph. The structural condition of a section of road is in need of close monitoring when it has a negative residual life. Figures are for the whole flexible network.

(b) Percentages may not add up to 100 per cent due to rounding.

(c) Excludes concrete pavements and elevated carriageways.

(d) 2015-16 Figures calculated using Pandef processing software

Skidding resistance

Skidding resistance relates to wet or damp road surfaces. It is a measure of the road surface condition to the resistance between the vehicle's tyres and the road when accelerating, braking or cornering. Testing takes place after the road surface has been pre-wetted, as the road surface will exhibit least friction and skid resistance when wet. 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 less than 0.1 per cent surveyed found to be at or below investigatory level in 2015-16. Over the last 10 years, less than 1 per cent of the surveyed network has been found to be at or below a satisfactory level on an annual basis. For the rest of the trunk road network, 9.5 per cent was found to be at or below investigatory level in 2015-16, the highest proportion below investigatory level since 2008-09. Over the last 6 years, the proportion at or below the satisfactory level has remained fairly stable, only fluctuating by around 3 percentage points.

Nearly all of lane 1 of the Motorway and Trunk Road network has been surveyed on an annual basis over the last 10 years therefore the results are considered accurate.

Table 5: Road condition: Skidding resistance of all trunk roads in Wales 2004-05 to 2015-16

Road class	Lane 1 length of network (km)	Lane 1 length surveyed (km) (b)	Lane 1 percentage of length surveyed (b)	Kilometres and per cent	
				Lane 1 percentage of length surveyed at or below investigatory level (c)	
Motorways					
2005-06	325	325	100		0.5
2006-07	325	325	100		0.4
2007-08 (e)	364	313	86		0.1
2008-09	364	311	85		0.2
2009-10
2010-11	361	279	77		0.7
2011-12	391	302	77		0.3
2012-13	395	318	80		0.0
2013-14	395	327	83		0.1
2014-15	327	327	100		0.0
2015-16	327	326	100		0.1
All purpose trunk					
2005-06	3,071	2,979	97		25.2
2006-07	3,071	2,865	93		16.7
2007-08 (e)	3,104	2,945	95		6.6
2008-09	3,104	2,972	96		9.5
2009-10
2010-11	3,108	3,108	100		8.3
2011-12	3,160	2,934	93		8.6
2012-13	3,218	3,035	94		5.5
2013-14	3,218	3,141	98		7.2
2014-15	3,243	3,193	98		7.9
2015-16	3,261	3,071	94		9.5

Source: Welsh Government

(a) Figures were calculated on a new basis from 2004, which affects all-purpose trunk roads more severely than motorways.

(b) Figures relate to road lengths surveyed in the year and in the previous year (for 2006 and earlier years).

(c) 'At or below investigatory level' does not mean the roads are unsafe; it indicates a need for further investigation to determine if for maintenance of that section of road.

(d) New figures for 2003 were back-calculated to provide a figure equivalent to the new standard used from 2004.

(e) In 2007, for the first time all surveyed lengths are taken from the same year and figures are therefore truly representative of that particular year. Also, Lane 1 length of network has been updated.

Local authority road conditions

Local Authorities, as the local highway authority, are responsible for County A roads, B and C roads and minor surfaced roads that they have adopted. They are responsible for nearly 33,000 kilometres of the road network.

Powys has the highest percentage of its network that are in need of further investigation (19 per cent) followed by Ceredigion (13.2 per cent), Wrexham (12.8 per cent) and Carmarthenshire and Gwynedd (both 10.7 per cent). Care should be taken when interpreting these figures as Powys has the largest local road network in Wales (just over 5,000km), followed by Carmarthenshire (3,348km).

Table 6: Road condition: Proportion of local authority road network in need of further investigation due to its condition

Local Authority	Percentage of Principal A, B roads and C roads in need of further investigation (a)		
	2013-14	2014-15	2015-16
Isle of Anglesey	11.7	10.9	8.9
Gwynedd	9.4	9.2	10.7
Conwy	10.7	10.7	9.4
Denbighshire	9.6	8.7	8.4
Flintshire	4.3	4.5	4.0
Wrexham	16.7	13.8	12.8
Powys	20.4	19.7	19.0
Ceredigion	15.6	15.0	13.2
Pembrokeshire	12.0	9.1	6.6
Carmarthenshire	15.7	11.9	10.7
Swansea	6.7	4.8	5.1
Neath Port Talbot	6.7	5.6	4.3
Bridgend	6.9	7.8	7.0
The Vale of Glamorgan	9.9	9.9	9.2
Cardiff	6.9	6.8	5.2
Rhondda Cynon Taf	9.9	9.3	8.6
Merthyr Tydfil	7.6	5.9	5.1
Caerphilly	8.8	7.0	6.6
Blaenau Gwent	7.5	6.4	4.8
Torfaen	6.4	5.7	5.4
Monmouthshire	9.8	9.7	9.2
Newport	8.6	7.9	5.3
Wales	13.2	11.9	11.2

Source: Local Government Data Unit Wales, National Performance Indicators THS/012

(a) 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; that is in poor overall

Notes

1 Context

Related publications

The Welsh Government publish data on the volume of [road traffic](#).

The [Department for Transport \(DfT\)](#) also produce a series of road length statistics which provide estimates of the length of all roads maintained at public expense in Great Britain, by road category and region. Separately, the [Department for Transport \(DfT\)](#) also produce a series of road condition statistics which provide information on the condition of local authority road, motorways and trunk roads in England.

2 Data source

Most information on road lengths is submitted annually to the Welsh Government by each of the 22 Welsh local authorities. Data as at 1 April of a given year are used for the financial year that concluded on the previous day.

The estimates of structural road condition are derived from the National Roads Maintenance Condition Survey (NRMCS).

The local authority road condition information is based on the performance indicator data for local authorities in Wales, compiled by the Local Government Data Unit ~ Wales, together with administrative data compiled for the management of the trunk road and principal road networks in Wales.

3 Definitions

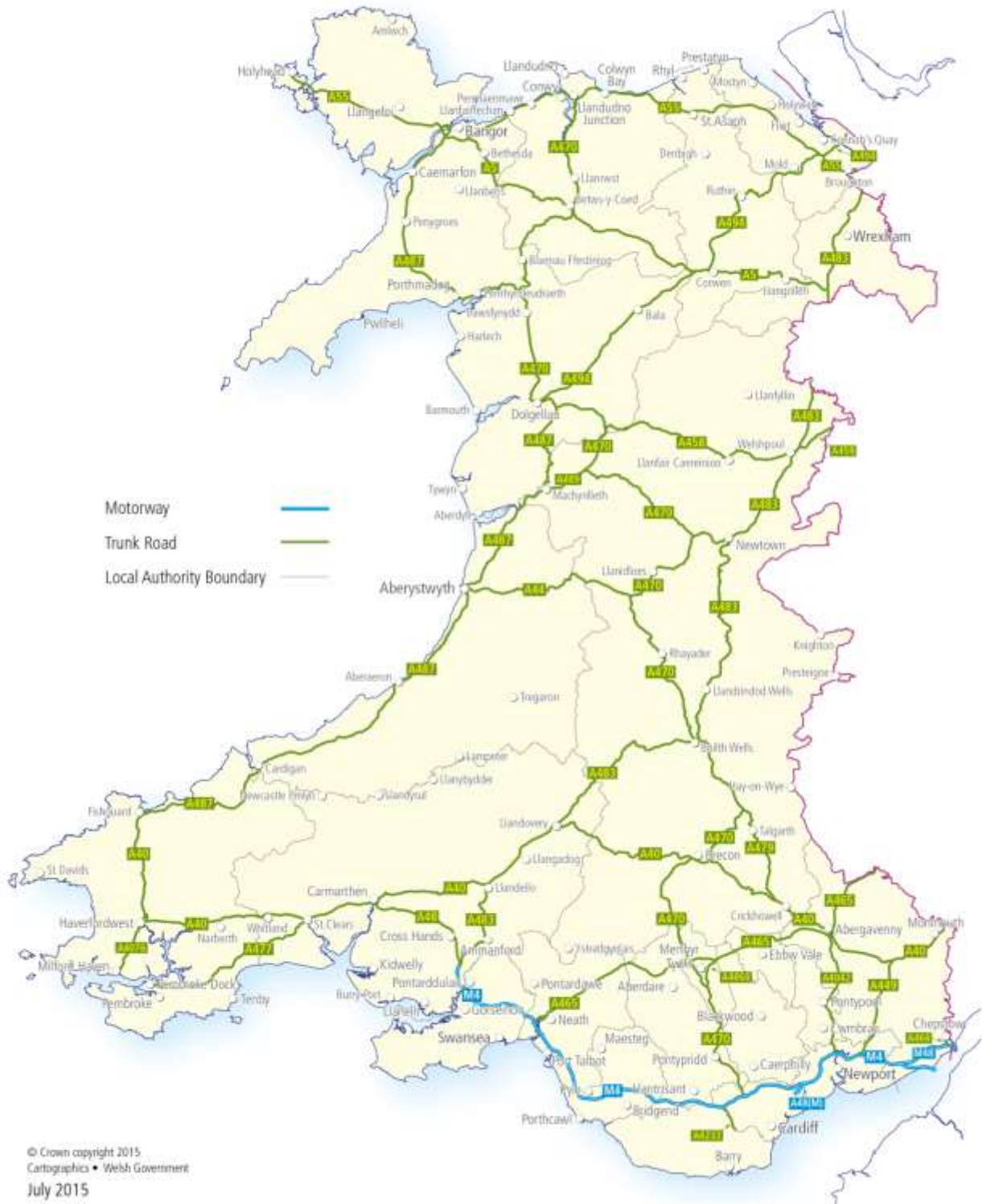
3.1 Coverage

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. The data are provided by the Welsh Government's Network Management Division.

A: Trunk roads: A 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 overleaf displays the trunk road network in Wales.

WALES

Trunk Road Network



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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.

Deflectograph surveys: Information on the structural condition of major roads is usually collected by means of Deflectograph Surveys. A Deflectograph is an automated technique for measuring the deflection of a road surface under a standard load. Software such as DEFLEC and PANDEF have been developed to allow the structural condition of the road to be derived from the measured deflections, given certain data about the construction of the road and about the traffic loading.

Residual life: The residual life of a road is the expected period before its structure reaches an 'investigatory condition'. The point at which close monitoring of structural condition should start is defined to be when residual life falls below zero, i.e. there is a negative residual life.

4 Methodology - Road condition survey

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

The assessment procedure used depends on the type and its mode of deterioration. Some thick well-constructed flexible pavements 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 pavement bends under the weight of a standard axle. This information is integrated with details of the pavement construction and present and future traffic flows to determine the residual life of the pavement and the recommended overlay.

Deflectograph surveys are undertaken annually on the WG Trunk Road Network and are conducted in March through to mid-June and mid-September to the end of October.

In past years there have been two main methods of processing Deflectograph data. WG has made use of the Deflec method, which has processed all of the surveys up to 2014/15. This has become superseded by the Pandef method of processing.

The Pandef processing system is a further software development refined in the 2000's to take account of 'Long-life' roads. These refer to roads with a continuous bituminous thickness of greater than 300mm, and also categorise roads with 200mm-300mm bituminous thickness as 'potentially long-life, if they display low deflection.

The Pandef calculation uses known deflection curves for specific bituminous constructions to apply to measurements extracted in the survey. Traffic rates, in particular profiles of commercial vehicles, which are categorised in greater detail than the previous Deflec calculation, are used to provide a

measure of residual life. The Pandef calculation incorporates future traffic prediction and growth rates.

This change in software has aligned the Welsh Government with the rest of the UK, including Highways England and Transport Scotland.

Pandef also uses individual traffic profiles for each commercial vehicle classification, which would lead to more accurate calculations for recommendations of maintenance treatment and residual life.

5 Symbols

The following symbols have been used throughout the bulletin:

. not applicable

.. not available

6 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.

6.1 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.

6.2 Accuracy

See sections 4 and 5.5.

6.3 Timeliness and Punctuality

The statistics on road lengths and conditions relate to data obtained for the financial year 2015-16.

6.4 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.

6.5 Comparability and coherence

In past years there have been two main methods of processing Deflectograph data. WG has made use of the Deflec method, which has processed all of the surveys up to 2014-15. This has become superseded by the Pandef method of processing.

This change in software has aligned the Welsh Government with the rest of the UK, including Highways England and Transport Scotland.

It has also overcome the problem that the Deflec processing had reached the point at which its traffic model, based upon trend data, had reached its upper limit for future traffic prediction. Future prediction was no longer possible with this method of processing.

The Deflec method of processing has recently become obsolete and whilst WG had resisted the change due to the previous advantage of having the year on year comparable data, there is now a definitive requirement for change.

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 Official 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 Official 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.

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 and this release includes none of the national indicators.

Information on indicators and associated technical information - [How do you measure a nation's progress? - National Indicators](#)

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

Further details

The document is available at:

<http://gov.wales/statistics-and-research/road-lengths-conditions/?lang=en>

Further tables of data are available at : <https://statswales.gov.wales/Catalogue/Transport>

Next update

December 2017.

We want your feedback

We welcome any feedback on any aspect of these statistics which can be provided by email to

stats.transport@wales.gsi.gov.uk.

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