Trevor Collett

LGTAG Past President & Highways England Area 3 Asset Data Manager

Asset Condition Rating – Looking for a Common Language

CIHT 11th September 2019

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The Local Government Technical Advisors Group

Part 1 - LGTAG

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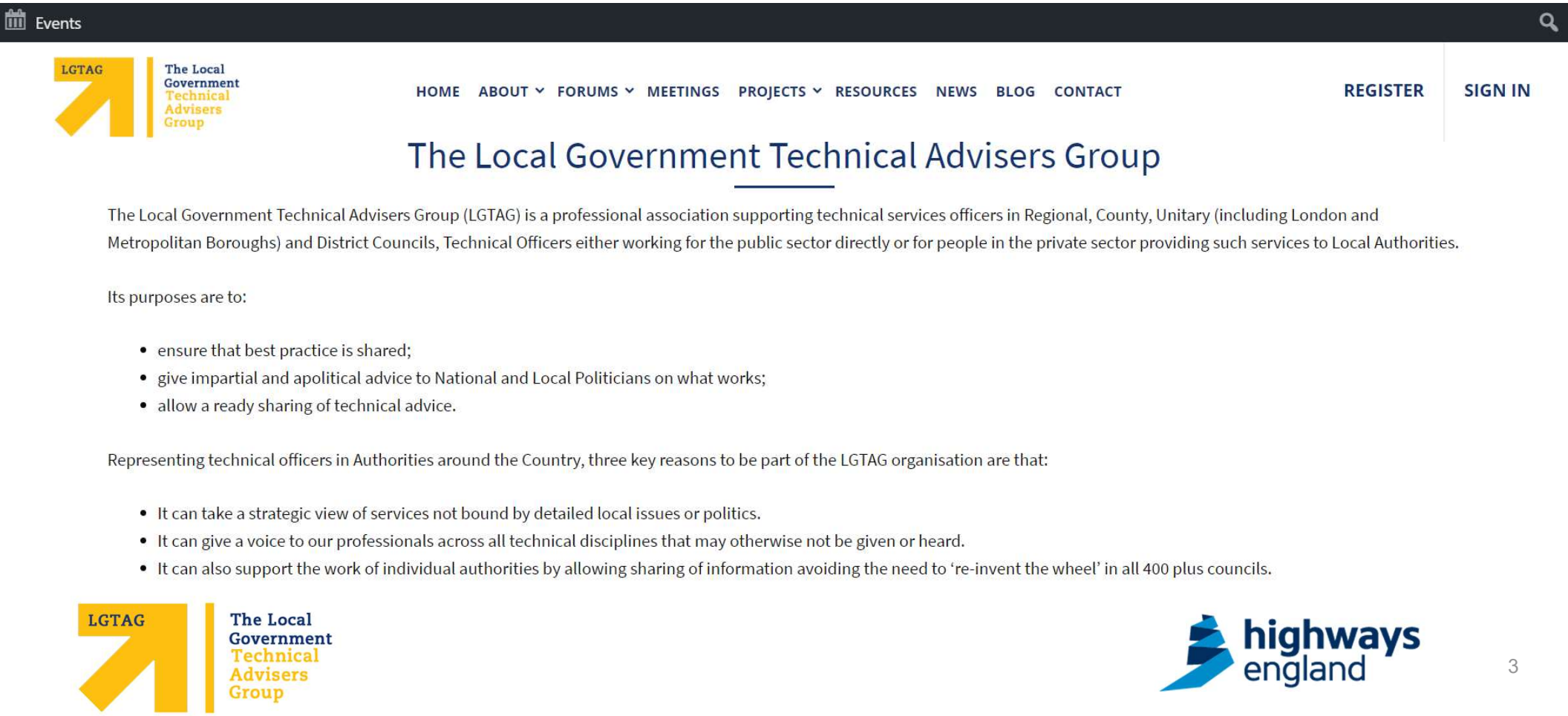

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Membership of LGTAG is by authority or organisation and once an organisation is a member any number of individuals in that organisation can take part in LGTAG activities.

LGTAG organisations are responsible for:

- Over half the road network serving the major conurbations and Unitary authorities
- Three-quarters of the brown field development land
- Over half of the population of England and Wales.
- Half of the coast line of England
- Two thirds of the most susceptible areas to flooding.

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Part 2 – Macro Condition

Disparate asset types

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Personal assets

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What is the condition of the England's highway network?

Tick a box:

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Definitive condition data

- *Where would you go to get a report on the condition of our highway network?*

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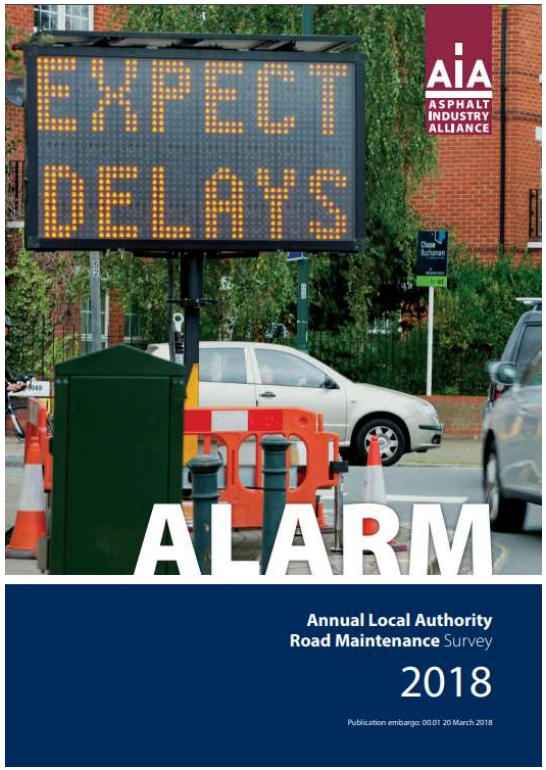
AIA's ALARM survey



The most staggering finding from this year's ALARM survey has to be the sheer scale of local roads in England and Wales that need imminent repair. It's unfathomable to think that you could drive almost around the world on the length of local authority roads that could fail if they are not fixed in the next 12 months – but that is the reality.

Introduction by Rick Green, Chairman, Asphalt Industry Alliance

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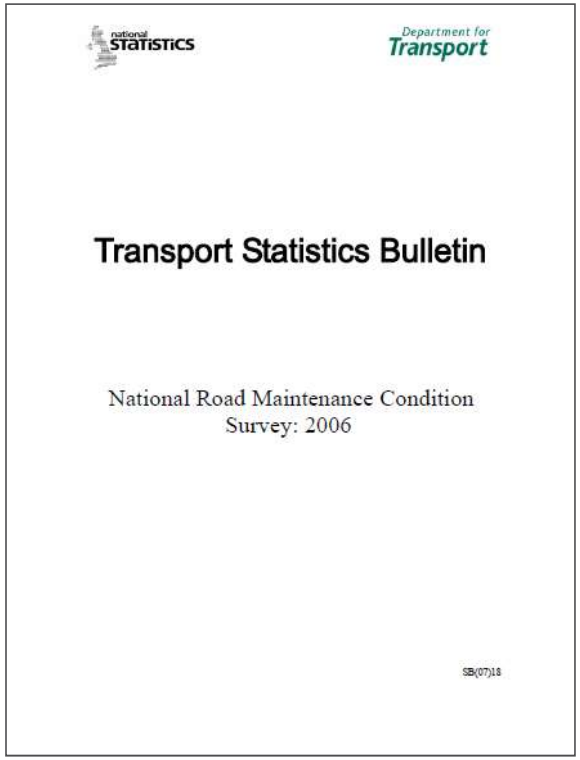
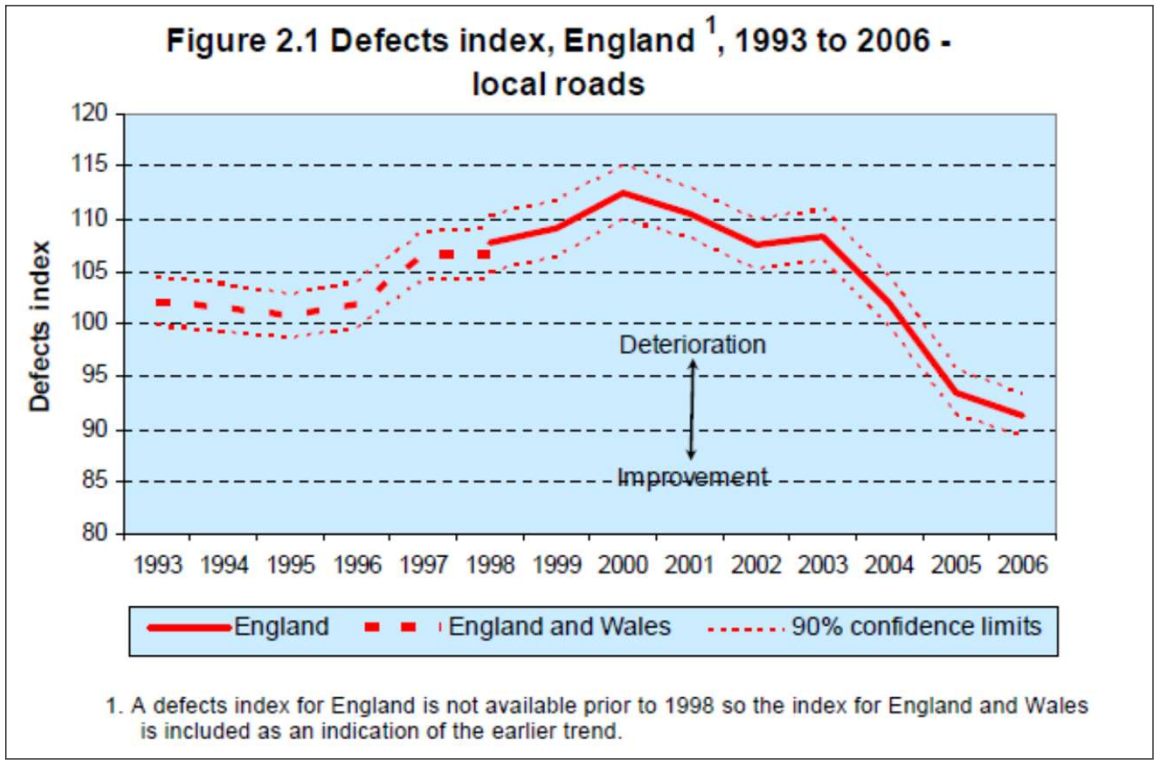
NRMCS - National road condition indicator





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Current DfT road condition report

Statistical Release 31 January 2019

Department for Transport

Road Conditions in England to March 2018

The condition of local authority (LA) managed roads have remained stable in the most recent years. This follows a period of gradual improvement for classified 'A', 'B' and 'C' roads.

About this release

This annual release presents information on the condition of roads in England, as well as other aspects of highways maintenance.

Figures for road condition are available back to the financial year 2007/08, with the most recent available data covering the period 2017/18.

Automated survey machines and visual surveys are used by local authorities (LAs) and Highways England (HE) to determine the percentage of the network that *'should have been considered for maintenance'* (see side bar on page 3).

Regional and national figures include all LAs with data that passed validation checks.

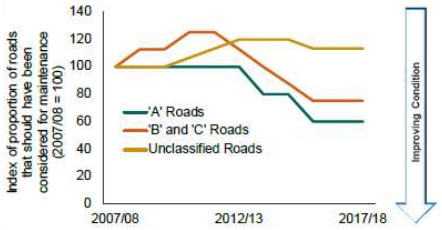
In this publication

In 2017/18 (year ending March 2018) the proportion of LA managed roads that should have been considered for maintenance was:

- 3% of 'A' roads;
- 6% of 'B' and 'C' roads;
- 17% of unclassified roads

These figures are in line with the previous 2 years. Prior to this 'A' roads, and 'B' and 'C' roads combined, had seen a period of gradual improvement (i.e. fewer roads considered for maintenance) since 2011/12. Unclassified roads had not seen the same improvement over this period.

Trend in the proportion of LA managed roads that should have been considered for maintenance, in England, by road type, 2007/08 to 2017/18 [RDC0120]



RESPONSIBLE STATISTICIAN: Name: Ashley Singh Email: roadmaintenance.stats@dft.gov.uk
FURTHER INFORMATION: Media: 020 7944 3066 Public: 020 7944 3095

Follow @DfTStats

Road Condition - Local Authority Managed 'A' Roads

LA managed 'A' roads account for around 9% of the road network in England. In 2017/18, the proportion of these roads that should have been considered for maintenance was 3%, in line with the previous 2 years.

Chart 1: Proportion of LA managed 'A' roads that should have been considered for maintenance, 2007/08 to 2017/18 [RDC0120 RDC0121]

- LA managed motorways are not included in these figures; they account for less than 1% of the LA major road network.

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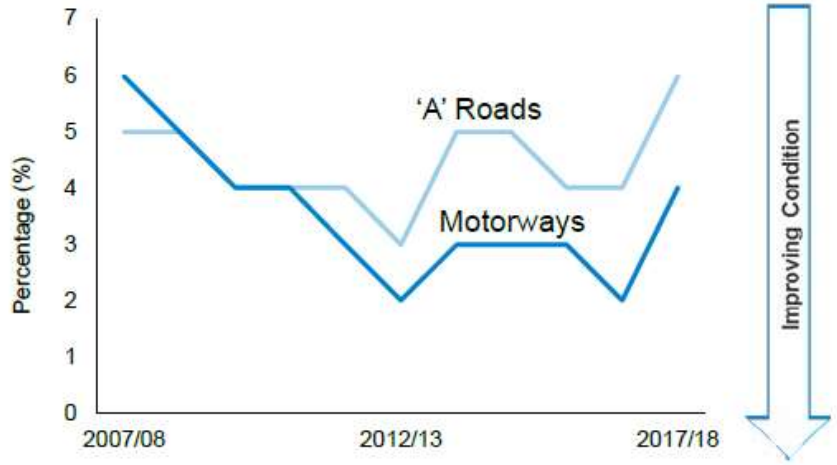
Current DfT road condition report

Road Condition - Highways England Managed Roads

Chart 6: Proportion of the Highways England (HE) managed road network that should have been considered for maintenance, by road type, 2007/08 to 2017/18 [RDC0201]



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DfT condition report – page 2

Other measures of condition also exist. The Asphalt Industry Alliance carry out the Alarm Survey and report on a measure of structural condition alongside other measures (see here). The RAC have also introduced a pothole index using their members' breakdown data, and are using this as an ongoing measure of the state of the UK roads (see here).

NHT – Highway Condition

Highway Authority	Satisfaction
Portsmouth	53%
Sheffield	51%
Halton	48%
Herefordshire	20%

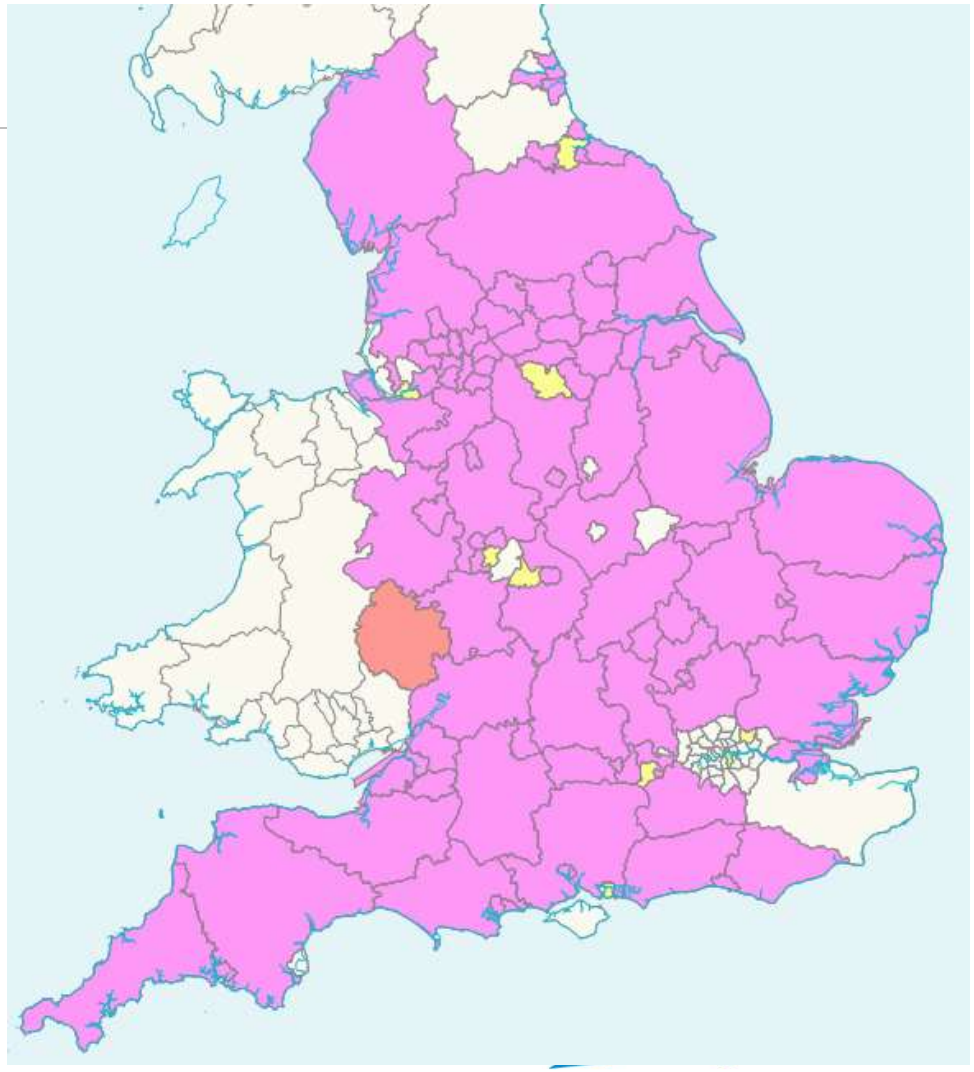

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Table RDC0120 – Principal roads

Table RDC0120
Single Data List items 130-01 and 130-02[1] (Former National Indicators 168 and 169)
Principal and non-principal classified roads where maintenance should be considered, by local authority in England, 2007/08 to 2016/17

			Principal (LA maintained 'A' roads)									
ONS Area Code	Region	Local Authority	2007/08	2008/09	2009/10	2010/11[2]	2011/12a	2012/13a	2013/14a	2014/15a	2015/16a	2016/17a
E06000008	North West	Blackburn with Darwen UA	4	4	4	4	5 a	4	4	4	4	3
E06000009	North West	Blackpool UA[3]	7	7	6	6	: a	: a	7 a	4	4	2
E10000004	North West	Cheshire[4]	4	4	.	.	.	.	.	.	.	.
E06000049	North West	Cheshire East UA[4]	.	.	5	5	6	6	5	3	3	2
E06000050	North West	Cheshire West and Chester UA[4]	.	.	3	3	3	2	2	1	1	2
E06000006	North West	Halton UA	1	1	1	1	1	1	1	1	1	1
E06000007	North West	Warrington UA	5	2	4	6	6	4	3	2	2	2
E10000006	North West	Cumbria	4	5	6	6	6	6	5	5	4	3
E08000001	North West	Bolton	5	4	6	6	4	4	2	2	3	3
E08000002	North West	Bury	6	4	6	7	8	3	3	5	5	8
E08000003	North West	Manchester[3]	6	6	6	6	11	7	6	11	5 r	8
E08000004	North West	Oldham	11	8	8	14	9	9	7	6	8	5
E08000005	North West	Rochdale	10	8	6	:	9	10	10	7	4	4

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Table RDC0120 – Non-principal roads

Percentage

ONS Area Code	Region	Local Authority	Non-principal (LA maintained 'B' and 'C' roads) 2007/08	2008/09	2009/10	2010/11[2]	2011/12a	2012/13a	2013/14a	2014/15a	2015/16a	2016/17a
E06000008	North West	Blackburn with Darwen UA	13	10	11	10	11 a	11	10	8	6	4
E06000009	North West	Blackpool UA[3]	4	7	4	5	7 a	5 a	3 a	4	6	5
E10000004	North West	Cheshire[4]	6	6	.	.	.	.	.	.	.	.
E06000049	North West	Cheshire East UA[4]	.	.	9	11	11	11	7	5	5	4
E06000050	North West	Cheshire West and Chester UA[4]	.	.	5	12	10	10	9	7	2 r	4
E06000006	North West	Halton UA	4	3	3	3	3	4	3	2	1	1
E06000007	North West	Warrington UA	12	6	7	8	9	8	5	2	2	2
E10000006	North West	Cumbria	9	12	13	14	17	16	14	12	9	9
E08000001	North West	Bolton	8	6	6	5	5	3	3	4	3	2
E08000002	North West	Bury	9	6	7	8	8	3	4	4	4	6
E08000003	North West	Manchester[3]	6	6	5	6	8	6	8	14	9 r	13
E08000004	North West	Oldham	12	7	7	7	6	6	7	6	3	4
E08000005	North West	Rochdale	11	8	6	:	10	10	11	6	6	6

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A Road Condition Index

RCMG
Road Condition Management Group

SCANNER Road Condition Index

Individual SCANNER parameters can be used to identify lengths containing particular types of defect. However, the SCANNER Road Condition Index (RCI) was developed through the SCANNER research programme to combine SCANNER defects into a single value to assist in the assessment of road condition. The approach used to combine the SCANNER defects was developed by Cartwright & Pickett (2004). This was used with an initial set of thresholds and weightings to calculate the 'original RCI' for 2006 and 2007. Further research (McRobbie, Walter, Read, Viner & Wright, 2007) led to new thresholds giving a 'revised RCI' which has been used since 2008.

The revised SCANNER RCI is calculated using a sub-set of the parameters measured by SCANNER (these are referred to as the core parameters), which are:

- Maximum rut depth
- 3m Moving Average Longitudinal Profile Variance
- 10m Moving Average Longitudinal Profile Variance
- Whole carriageway cracking
- Texture depth

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Part 3 – Micro Condition

Failed sign posts

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Asset Management

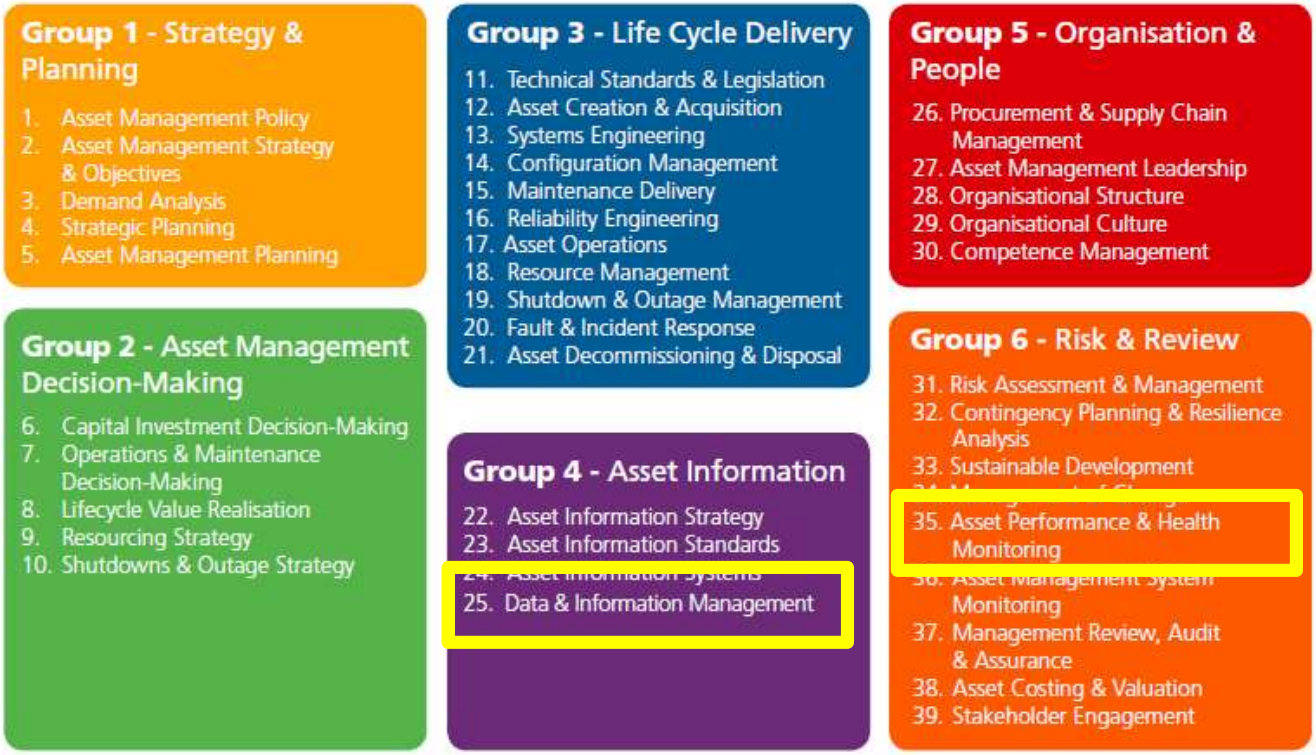

Figure 4: Alignment of the 39 Asset Management Landscape Subjects with the six Subject Groups

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Extract from ISO 55000 Part 1

2.5.3.7 Performance evaluation

The organization should evaluate the performance of its assets, its asset management and its asset management system. Performance measures can be direct or indirect, financial or non-financial.

Asset performance evaluation is often indirect and complex. Effective asset data management and the transformation of data to information (see 2.5.3.5) is a key to measuring asset performance. Monitoring, analysis and evaluation of this information should be a continuous process. Asset performance evaluations should be conducted on assets managed directly by the organization and on assets which are outsourced.

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Extract from ISO 55000 Part 2

9 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation

9.1.1 General

9.1.1.1 The organization should develop processes to provide for the systematic measurement, monitoring, analysis and evaluation of the organization's assets, asset management system and asset management activity on a regular basis. In the development of these processes (and any associated procedures) the following should be taken into account:

a) setting of performance metrics and associated indicators, e.g. condition or capacity indicators;

b) confirmation of compliance with the requirements;

c) examination of historical evidence;

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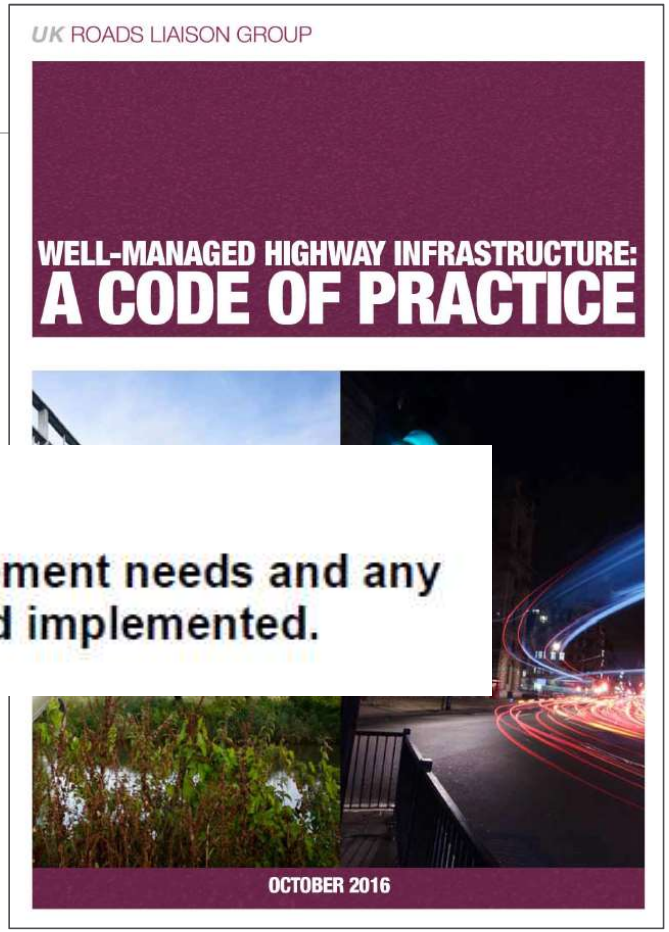
Guidance?



RECOMMENDATION 17 – CONDITION SURVEYS

An asset condition survey regime, based on asset management needs and any statutory reporting requirements, should be developed and implemented.

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So…what's the problem?

- How should a highway authority assess and record the condition of the thousands of individual highway assets of hundreds of different types?
- How many grades of condition should there be?
- What should each grade be called?
- What should the interval be between condition assessments?
- How to ensure there is consistency in assessment between assessors and between surveys?
- Is there any universally recognised guidance?

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How are we assessing condition now?

RAG

Blackpool – State of the Highway Network Report, 2009

The following map shows the overall condition of the Residential Footway

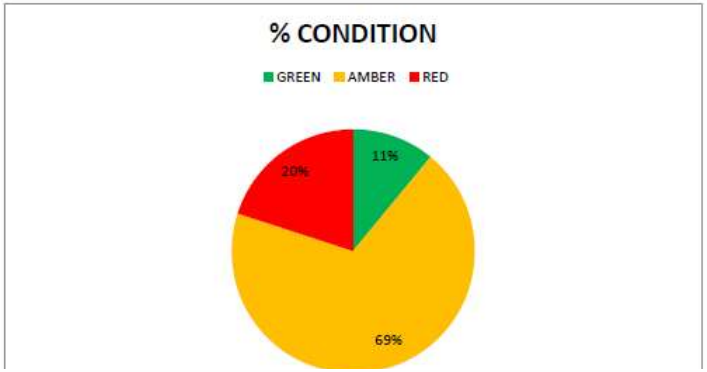
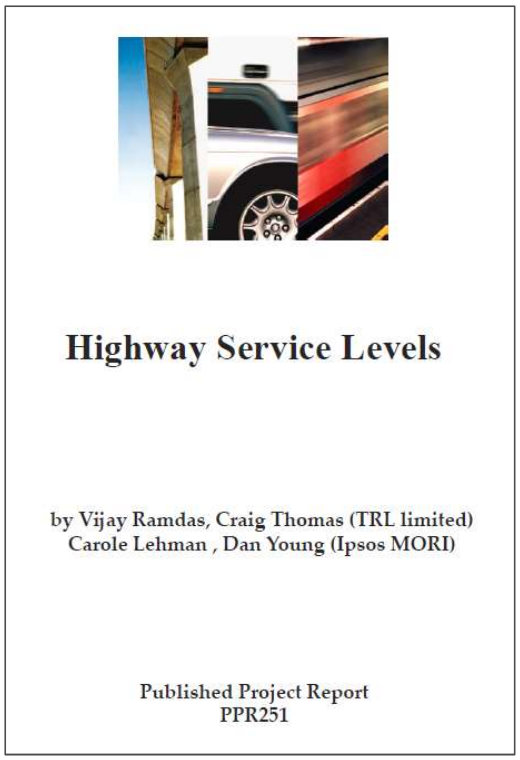


Table 1 – Local Condition Grade terminology used by Blackpool Council

Condition Grade	Description
GREEN	Asset condition reflecting new construction, or an older road that is structurally sound
AMBER	Average asset condition in a transitional stage where the condition becomes less predictable. The visual appearance may have extensive degradation or distress
RED	Failure of the asset either in part or whole with no residual life. High cost to repair, could be dangerous and requires extensive treatment

What condition level are we looking to provide?



Highways England Delivery Plan 2015-2020

our asset management capability. Additionally, as we introduce IAMIS, we will work to develop and complete validation of new condition indicators for:

- Pavements and Structures for agreement by March 2017 and complete validation for these by March 2019

Prepared for: Project Record: CONTRACT PPRO 04/37/02 Highway Service Levels

Client: Local Transport and Funding Division Department for Transport (Edward Bunting)

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TD25/15 – Inspection & Maintenance of Traffic Signs on Motorways and All-Purpose Trunk Roads

2.1 The safety inspection of each traffic sign installation is necessary to identify defects which may affect safety or operational performance; to determine the overall condition of the asset; and to gather intelligence for use in determining the frequency of subsequent safety inspections.

2.26 The condition of the structure supporting a traffic sign must not present a safety hazard to road users, road workers or other parties.

2.27 The condition must be managed so that the life of each component of the structure is maximised.

No guidance on how to assess or record condition is given

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Traffic Signs Condition Rating – Highways England's Value Management Requirements

Condition Rating	Condition of Sign face	Condition of Post
1	Relatively clean no dents, or scratches.	Free of any damage, and do not indicate any rust blemish, paint peeling and cracking within the length of the poles.
2	Relatively clean, but may have small amount of moss, algae and lichen growing. The sign face may have some of the rivet covers missing; have a new sticker covering the existing sign text. Secondly the sign face may have had graffiti, which once removed, can distort the reflectivity of the sign face.	Posts have minor rust spots or bubbling of the paintwork / plastic coating, which equates to only 10% of the total length of the pole. No cracking or rust marks appearing on the galvanised poles.
3	Signs faces are heavily covered by algae and unclear to road users, damage or fading. A number of clips maybe missing, peeling off of secondary sign sticker on the sign faces.	Posts have high levels of rust, plastic coating peeling off, excessive rust marks all over the sign, damage to pole created by grass cutting or by unknown vehicles, creating Gash mark along the pole structure.
4	Signs faces with major damage to sign face by unknown third parties, fading and major vandalism to the sign face, and failure of the rear sign face structure.	Posts show extensive rust or holes and cracking within the length of the post which could potentially collapse within 2 years if left untreated

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Traffic Signs Condition Descriptions – Highways England's M25 DBFO Contract Conditions

Condition Description		Criteria Category
A	As new	As new condition.
B	More than satisfactory	No visual defects or obscuration.
C	Satisfactory	Partially dirty, slight obscuration by vegetation, etc, but otherwise in good overall condition. Low coefficient of retro-reflectivity but still above minimum levels.
D	Less than satisfactory	– Unacceptable quality of sign including any danger to maintenance staff; – Inadequate coefficient of retro-reflectivity (below 144 cd/lx/m² for Class 1 or below 40 cd/lx/m² for Class 2); – major obscuration of sign; – failure of illumination; and/or – misalignment to the road user.
E	Nearing end of serviceable life	– Sign defects represent an immediate or imminent failure; – Defects on a regulatory or mandatory sign; – A missing sign; – an update of the Traffic Signs Regulations and General Directions 2002 has made the sign obsolete; and/or – Asset is life expired.

Figure G-2: Condition Descriptions.

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Highways England's Drainage Condition Quick Assessment Method

Table 1: Structural and service grade definitions

Grade	Structural Condition	Service Condition
1	No defects	Clear
2	Superficial defects	Superficial deposits with no loss of performance
3	Minor defects	Performance slightly reduced
4	Major defects	Performance severely reduced
5	Not fit for purpose or unsafe	Blocked or unsafe condition
9	Assessment attempted but not possible	Assessment attempted but not possible
0	Assessment not attempted	Assessment not attempted

Now incorporated into CS551

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HD 29/08 – Data For Pavement Assessment

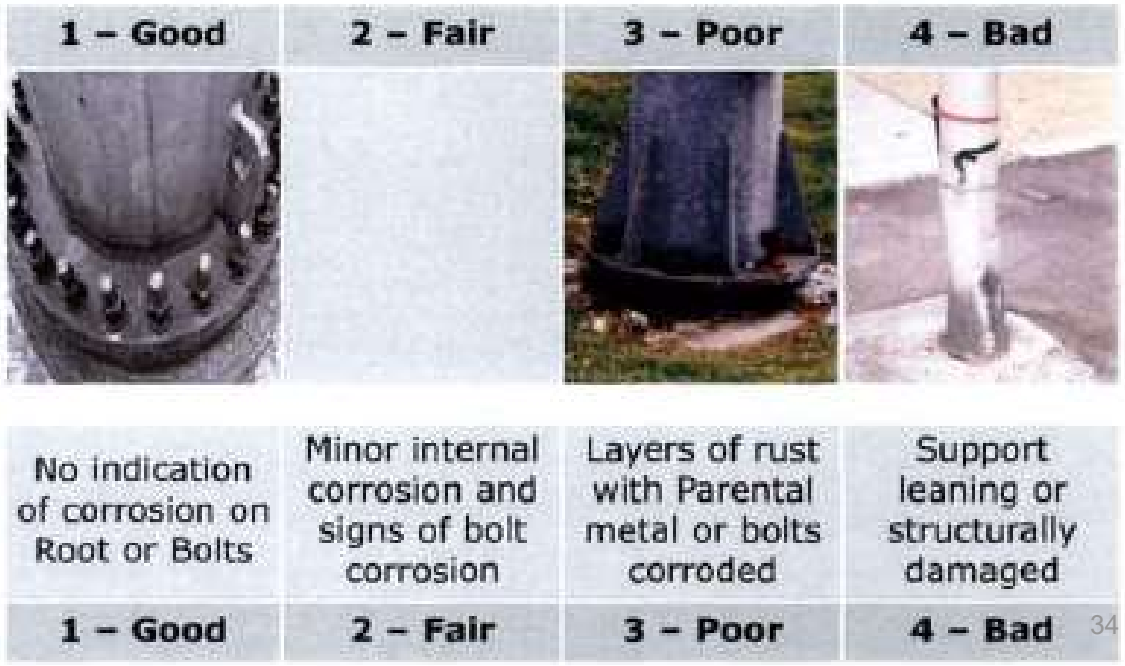
Category	Definition
1	Sound – no visible deterioration.
2	Some deterioration – lower level of concern. The deterioration is not serious and more detailed (project level) investigations are not needed unless extending over long lengths, or several parameters are at this category at isolated positions.
3	Moderate deterioration – warning level of concern. The deterioration is becoming serious and needs to be investigated. Priorities for more detailed (scheme level) investigations depend on the extent and values of the condition parameters.
4	Severe deterioration – intervention level of concern. This condition should not occur very frequently on the motorway and all purpose trunk road network as earlier maintenance must have prevented this state from being reached. At this level of deterioration more detailed (scheme level) investigations should be carried out on the deteriorated lengths at the earliest opportunity and action taken if, and as, appropriate.

Table 2.1: Condition Categories for Texture Depth, Rut Depth and Ride Quality

Technical Report 22 Managing a Vital Asset: Lighting Supports

The lighting support condition is to be assessed visually and documented using one of the following values for each section entered on the form.

1 - Good
2 - Fair
3 - Poor
4 - Bad



TD 26/17 - Inspection and Maintenance of Road Markings and Road Studs on Motorways and All-Purpose Trunk Roads

Table C.1: Visual Assessment Scoring for wear

Assessment	Score	Defect type when score averaged
Non-existent, residue only	0	Critical Defect
Barely visible	10	Critical Defect
Visible, but has randomly spaced small bare spots	20	Potentially Critical Defect – judgement required taking into account location and function and plan shall be put in place to manage
Marginal – some visible wear, larger bare spots	30	Non-Critical Defect
Very little wear	40	Non-Critical Defect
No obvious wear	50	Not a defect

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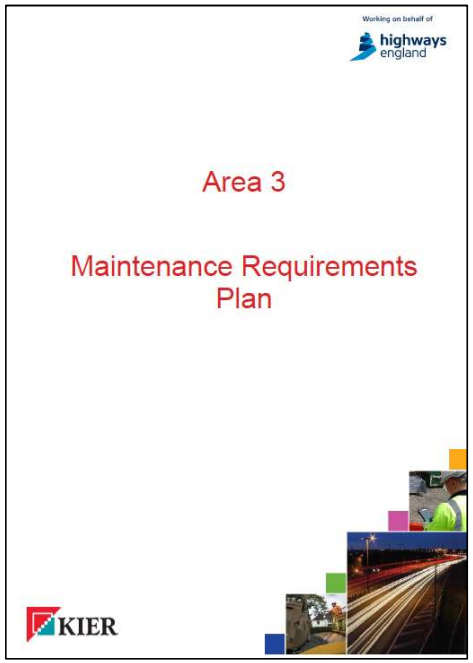
National Property Performance Indicators

A:	Good	Performing as intended and operating efficiently
B:	Satisfactory	Performing as intended but showing minor deterioration
C:	Poor	Showing major defects and/or not operating as intended
D:	Bad	Life expired and/or serious risk of imminent failure

Area 3 (before October 2017)



Asset surveys will be carried out by the AIWs to record the condition of the assets as one of the following:

1 - As New
2 - Good
3 - Satisfactory
4 - Poor
5 - Very Poor

(AIW – Asset Incident Watchman)

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2016/17 – Asset Surveys

	Condition						
	As New	Good	Satisfactory	Poor	Very Poor	TOTAL RATED	Not Rated
Asset type	**1**	**2**	**3**	**4**	**5**		**6**
Hatched Road Marking	39	38	894	30	4	**1005**	1
Longitudinal Road Marking	209	537	8154	164	38	**9102**	1
Transverse & Special Road Marking	78	64	3245	75	41	**3503**	2
Gully	1	62	27011	147	48	**27269**	19
Inlet	5	4	2199	16	1	**2225**	5
Manhole		28	4675	3	2	**4708**	31
Outlet		3	3963	34	1	**4001**	35
Fence, Barriers and Wall	5	94	3569	31	24	**3723**	142
Central Island		2	85	3		**90**	
Channel	1	13	854	24	2	**894**	
Crossover		6	932	2	1	**941**	12
Cycle Track	1	3	54	2		**60**	2
Footway	3	35	899	13	2	**952**	3
Highway	63	86	1245	156	57	**1607**	
Kerb	20	82	4381	21	1	**4505**	
Pedestrian Crossing			2			**2**	
Post (Signs)	20	263	6986	50	8	**7327**	2
Safety Bollard	4	3	1570	62	70	**1709**	3
Sign Face	29	309	9112	92	16	**9558**	2
	478	**1632**	**79830**	**925**	**316**	**83181**	
							83441

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2016/17 Surveys - Percentages

	As New	Good	Satisfactory	Poor	Very Poor
Asset type	**1**	**2**	**3**	**4**	**5**
Hatched Road Marking	3.9%	3.8%	89.0%	3.0%	0.4%
Longitudinal Road Marking	2.3%	5.9%	89.6%	1.8%	0.4%
Transverse & Special Road Marking	2.2%	1.8%	92.6%	2.1%	1.2%
Gully	0.0%	0.2%	99.1%	0.5%	0.2%
Inlet	0.2%	0.2%	98.8%	0.7%	0.0%
Manhole	0.0%	0.6%	99.3%	0.1%	0.0%
Outlet	0.0%	0.1%	99.1%	0.8%	0.0%
Fence, Barriers and Wall	0.1%	2.5%	95.9%	0.8%	0.6%
Central Island	0.0%	2.2%	94.4%	3.3%	0.0%
Channel	0.1%	1.5%	95.5%	2.7%	0.2%
Crossover	0.0%	0.6%	99.0%	0.2%	0.1%
Cycle Track	1.7%	5.0%	90.0%	3.3%	0.0%
Footway	0.3%	3.7%	94.4%	1.4%	0.2%
Highway	3.9%	5.4%	77.5%	9.7%	3.5%
Kerb	0.4%	1.8%	97.2%	0.5%	0.0%
Pedestrian Crossing	0.0%	0.0%	100.0%	0.0%	0.0%
Post (Signs)	0.3%	3.6%	95.3%	0.7%	0.1%
Safety Bollard	0.2%	0.2%	91.9%	3.6%	4.1%
Sign Face	0.3%	3.2%	95.3%	1.0%	0.2%
	0.6%	**2.0%**	**96.0%**	**1.1%**	**0.4%**

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Highways England ADMM

Asset Data Management Manual – Version 9.0, April 2019

Grade	Condition
1	As New
2	Superficial damage / deterioration with no loss of performance
3	Some damage / deterioration and performance may be slightly reduced
4	Significant damage / deterioration and performance may be severely reduced
5	Significant damage / deterioration / missing / failed and no longer fulfils its intended purpose

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The Way To Do it

- Four grades of serviceable condition
- Fifth point – ASSET FAILED
- Descriptors of grades: MTTF
- Interval between surveys by risk assessment for each asset type, could be variable during asset life cycle

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PROPOSED CONDITION SCALE - MTTF

(Mean Time To Failure)

Condition	Description
1	More than **10 years** before replacement required
2	Less than **10 years** but more than **5 years** before replacement required
3	Less than **5 years** but more than **2 years** before replacement required
4	Less than **2 years** before replacement required
5	Failed / Unserviceable
0	Unable to inspect

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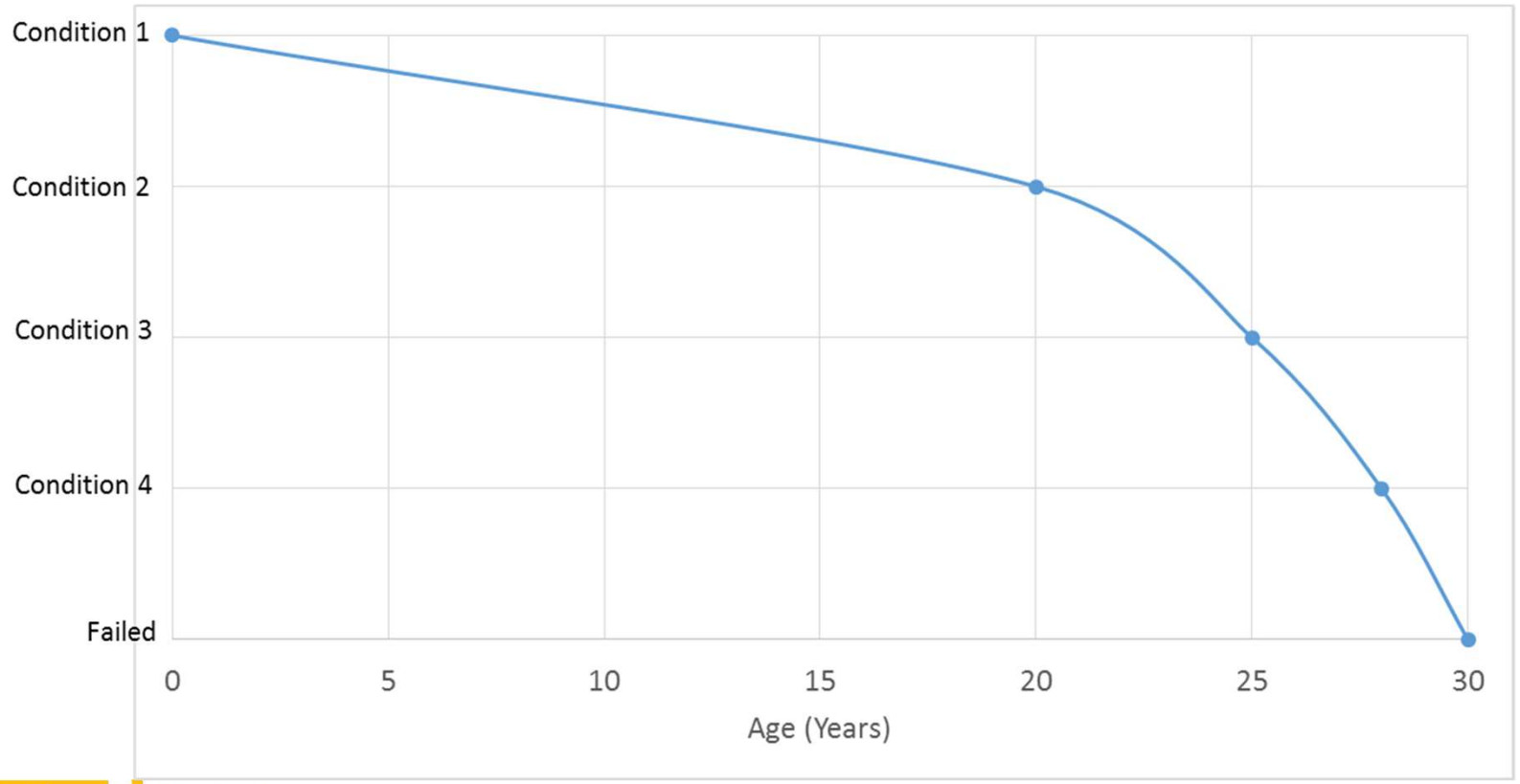
Asset With 30 Years Service Life



67%

17%

10%

7%

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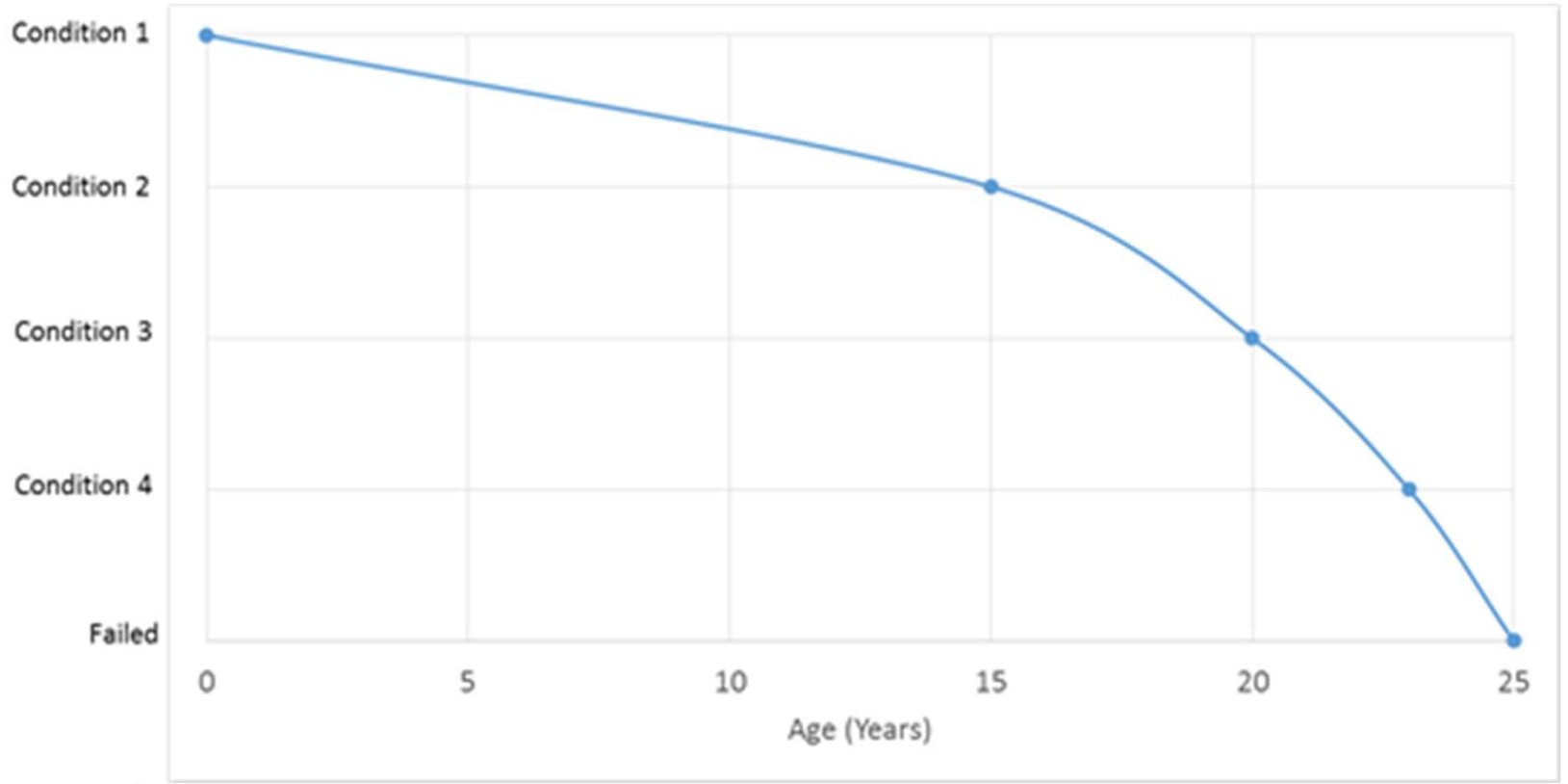
Asset With 25 Years Service Life



60%

20%

12%

8%

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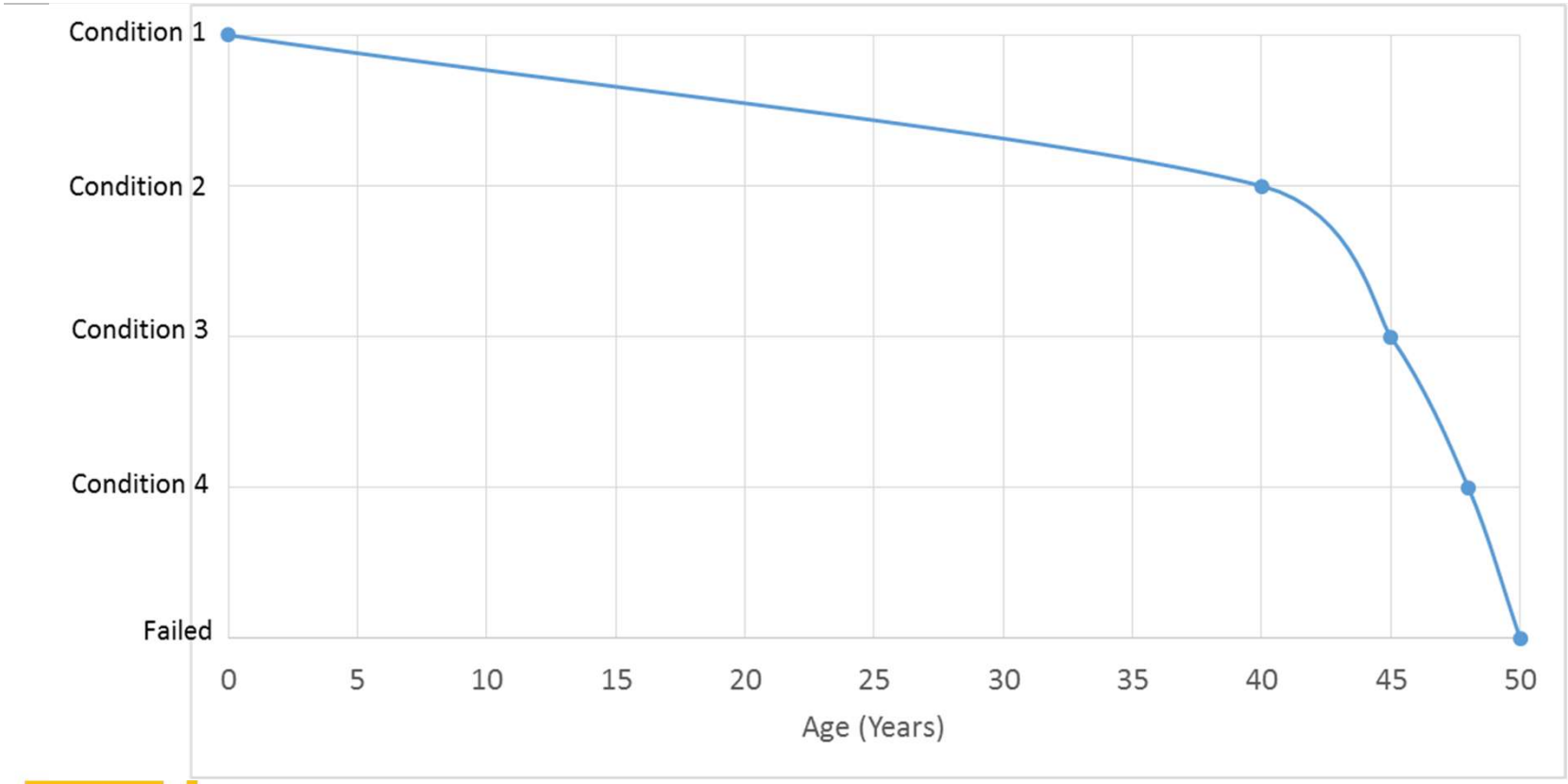
Asset With 50 Years Service Life



80%

10%

6%

4%

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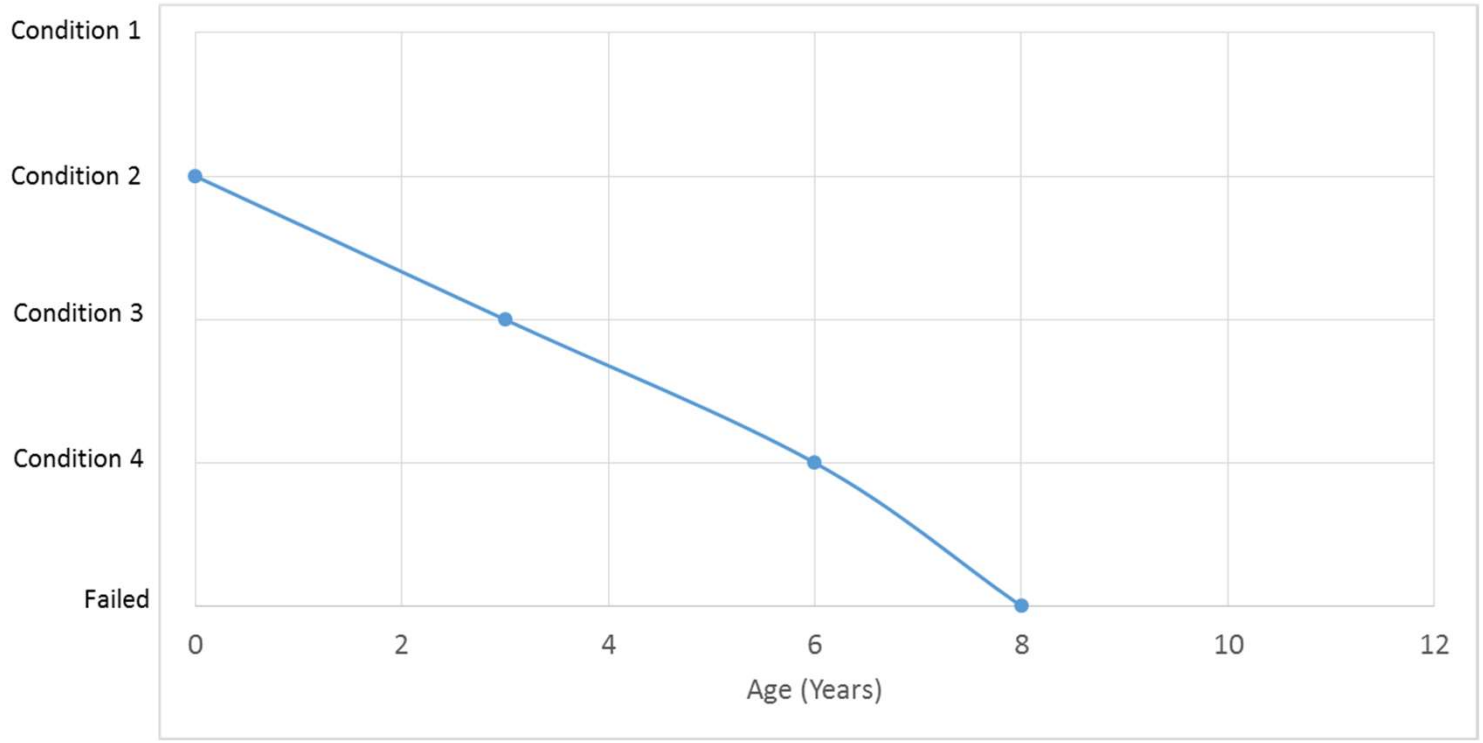
Asset With 8 Years Service Life



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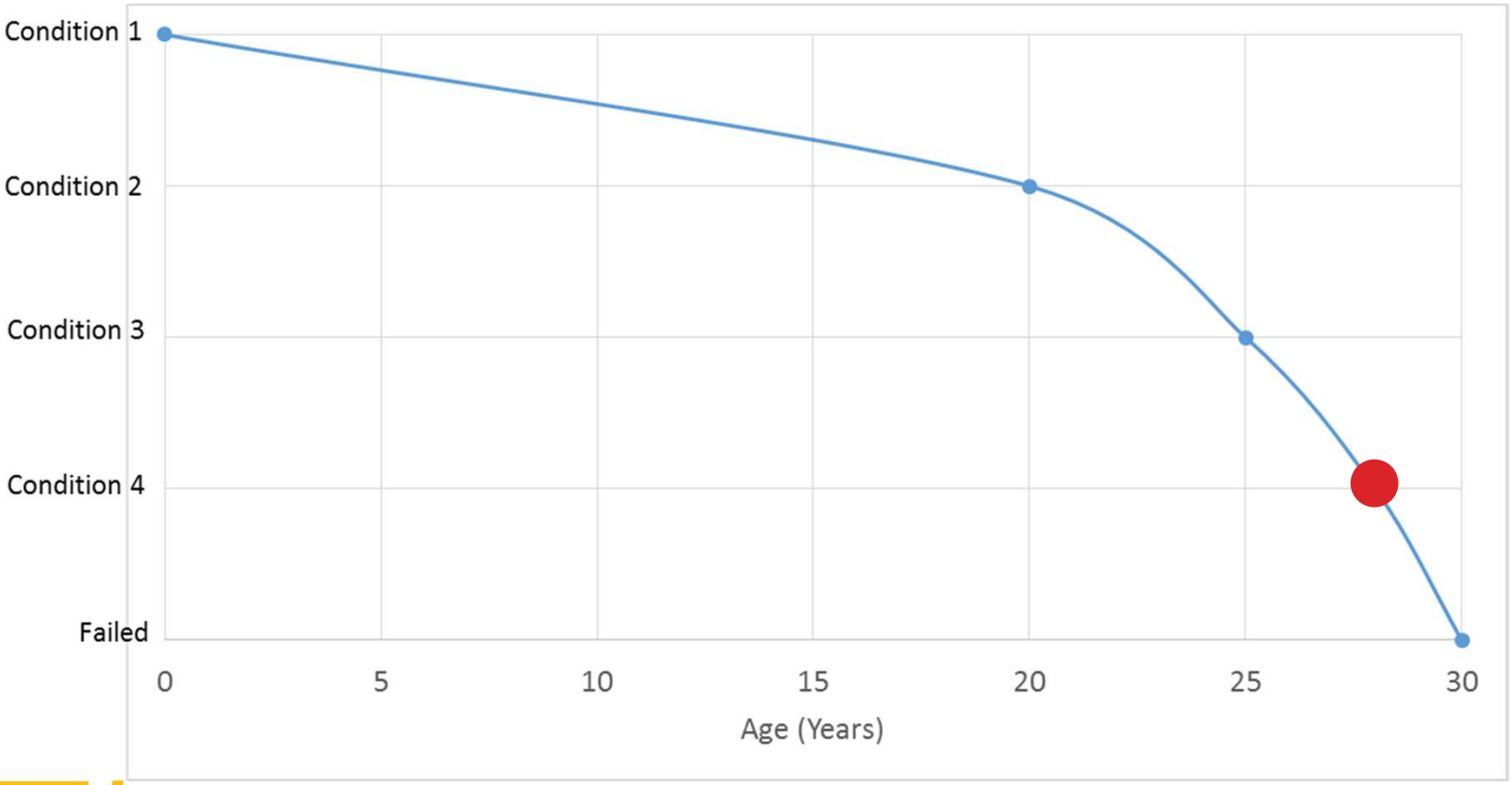
30 Years Service Life – Critical Point?



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Important Definitions

“For the purpose of clarity, a differentiation is made between surveys and inspections.

Surveys

Defined as the collection of data either by machine or visually. Machine surveys are the collection by machine of measurements. Visual surveys are a mixture of assessments and measurements, with data capture possibly by hand-held computer

Inspections

Defined as viewing of the relevant length of road, either on foot or from a slow moving vehicle, to apply and to record judgements but not to collect data.”

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The End

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