

## What is a pothole? A look at Local Highways Authorities road maintenance policy

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### 1. Summary

Historically, the systems used by Local Highways Authorities (LHAs) to decide when to repair road defects were predominantly prescriptive; potholes were recognised as such when some predefined criteria - usually some combination of width and depth - were met, at which point authorities aimed to effect temporary or full repairs.

Increasingly however - following recommendations by the UK Roads Liaison Group in October 2016 - LHAs have moved towards a risk-based approach (RBA) in maintaining their highways infrastructure. Often this still has trigger points determined by the physical characteristics of a defect, but the speed at which it is then rectified is dependent on the risk it poses, both to the integrity of the road structure and to the safety of road users and their vehicles.

This report suggests that 142 (75%) of the 190 (out of 207) LHAs in Great Britain which supplied information now predominantly use an RBA. A further 15 (8%) indicated that their current approach was under review or that they were planning to soon switch to an RBA.

LHAs will routinely inspect the roads in their care for defects, the frequency of those checks being determined by the road hierarchy. Key roads are commonly inspected once a month; local roads once a year. Defects will also come to LHAs' attention when reported by members of the public.

Once an LHA is alerted to a road defect, such as a pothole, it will be inspected. While 12 LHAs use a purely RBA to decide when and how to make a repair, most councils will still want to see that the defect (e.g. pothole) is above a certain size threshold, the level of which is set by authority and may vary by road hierarchy. At that point the LHA will decide the potential risk that road defect poses and categorise it accordingly.

The category determines the speed of action. In some cases, this means a pothole could be filled in within 30 minutes. In others, a pothole might only be dealt with when routine maintenance is again carried out on that stretch of road.

While the risk-based approach is arguably about better targeting finite resources, rather than simply ensuring a uniform quality of road surface, it brings to the fore a judgment on the risk to road users and their vehicles - which is, in principle, to be welcomed.

There might still only be enough funding to fill in one in ten potholes, but the ten will be those that pose the greatest risk to infrastructure, life and limb. The geographical size and type of road network (urban/rural) will also play a part in determining the repair times for the worst defects - physically it is easier to get around some authorities than others.

Thirty-seven authorities (20%) said they became interested at 20-30mm depth while 26 (14%) said they would only consider intervening at 50mm. Twelve took no account of size and said that even the most minor 'blemish' would be investigated and treated if deemed a risk.

## 2. Introduction

*The Well-managed Highway Infrastructure Code of Practice* - published in October 2016 by the UK Roads Liaison Group - recommended that Local Highways Authorities (LHAs) move away from the previous Code of Practice (*Well-maintained Highways*) to an RBA to identify and tackle road defects and manage their highway infrastructure.

LHAs were encouraged to make the changes by the end of October 2018, though adoption is not compulsory:

*“This Code of Practice is not statutory but provides Highway Authorities with guidance on highways management. Adoption of the recommendations within this document is a matter for each Highway Authority, based on their own legal interpretation, risks, needs and priorities.”<sup>1</sup>*

Under the new approach repairs are based not solely on a prescriptive set of defect characteristics but take into account the risk inaction poses to both the physical quality of the asset, and the safety of road users and their equipment. The approach is as much pro-active as reactive.<sup>2</sup>

The aim of this analysis is to shed further light on the highway maintenance practices of LHAs and determine the extent to which LHAs have made the shift to an RBA. This report is accompanied by LHA tables and an interactive online map.

Overall, almost all LHAs do, to varying degrees, take into account the risk posed by highway defects such as potholes.

Of the 190 LHAs which provided sufficient data, 142 (75%) said they use an RBA, with a further 15 (8%) indicating that their existing procedures were either under review or about to be updated. Even those authorities which had not switched to RBA tend to include a level of risk management. This is reflected in the frequency of their road safety inspections (a greater frequency on higher traffic roads) and/or the scale of repair times based on the severity of the defect (e.g. potholes). The most common repair time for the most urgent road defects is 2 hours (42% of LHAs) and the most common ‘minimum’ depth criteria carriageway pothole is 40mm (35%).

## 3. Method

A Freedom of Information (FOI) request was sent to each LHA on the 7 September 2018 asking information regarding their road maintenance policies such as:

- 1) Had the LHA moved to a RBA?
- 2) What is their safety inspection regime?
- 3) How they classified and responded to road defects (e.g. what is a pothole?)
- 4) What was their intervention/investigatory criteria specifically for potholes

(A full list of the questions is in the appendix.)

Of the 207 LHAs the FOI was sent to, 193 (93.2%) had responded by the end November 2018. Of these 193 responses, 190 contained sufficient data to be used in this analysis.

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<sup>1</sup> UKRLG. *Code of Practice ‘Well-managed highway infrastructure’*. Webpage updated 08.11.2017. <http://www.ukroadsliaisongroup.org/en/codes/>

<sup>2</sup> UKRLG. *Technical Paper. Benefits of highway asset risk management explained*. Sept 2017. <http://www.ukroadsliaisongroup.org/download.cfm/docid/2196CD22-B955-41A0-B2C12FD97F2BCDC9>

## 4. Key results

### 4.1 A risk-based approach

Of the 190 LHA responses, 75% (142) of authorities say that they use an RBA with a further 15 (8%) indicating that the current approach was under review or that they soon would be switching to an RBA.

### 4.2 Carriageway inspection frequencies

The most common inspection regime – followed by 53 (28%) of the 190 LHAs - is that recommended in *Well-managed Highway Infrastructure Code of Practice*:

- 1) primary routes, secondary and main distributors inspected every month
- 2) link roads every 3 months
- 3) local roads once a year

However, there are 109 different combinations of inspection frequency regimes across the 190 local authority responses used in the analysis, suggesting a large degree of flexibility and adjustment based on local needs and resources.

Carriageway inspections are carried out through a combination of walked and driven inspections. Road surface defects such as potholes or missing ironworks (manhole covers, drain grates) are recorded during these inspections though all authorities receive news of potential defects via public reporting.

Authorities also inspect footways based on a similar hierarchy regime however there was insufficient data relating to footways in the FOI responses to be analysed in this report. The recommended footway frequencies are:

- 1) prestige area and primary walking routes inspected every month
- 2) secondary walking routes every 3 months
- 3) link footway every 6 months
- 4) local access footway once a year

### 4.3 Road defect repair times

The FOI responses show that road defects are categorised – and hence prioritised for repair - through defect severity (i.e. how deep and wide a pothole is) and/or the risk the defect poses. The risk is calculated by assessing the defect size and location as well as the likelihood of exposure to it: the volume and mix of traffic on the road. The calculation is typically worked out with the aid of a risk matrix that takes into account the size and severity of the defect and its potential impact on road users.

Figure 4.1: An example of a risk matrix for defect categorisation from the Devon County Council, Highway Safety Inspection Manual

Table 1.0 RISK MATRIX						
		PROBABILITY / LIKELIHOOD OF INTERACTION WITH HIGHWAY USER				
		Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost Certain (5)
IMPACT	None (1)	1	2	3	4	5
	Negligible (2)	2	4	6	8	10
	Minor (3)	3	6	9	12	15
	Moderate (4)	4	8	12	16	20
	Serious (5)	5	10	15	20	25

  

Category 4 (Low Risk) Consider an appropriate response including no further action/monitor	Category 3 (Medium Risk) Repair within 28 days	Category 2 (High Risk) Make safe or repair within 7 days	Category 1 Make safe or repair by end of the next working day
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Note:

**Defects identified that pose a threat to life are considered an emergency and must be responded to, normally within 2 hours and made safe or repaired urgently.**

The categories – which are likely to vary by name across LHAs but are broadly similar to those seen in Devon - tend to have an associated response time for repairs to be undertaken. As with road defect categories themselves, these repair times for can vary from authority to authority.

Table 4.1 below shows that 16 (8%) LHAs will aim to repair the most serious/hazardous defects within an hour. However, Harrow Council seeks to address their worst defects within 30 minutes, while Cumbria, South Lanarkshire and Flintshire aim to act “immediately”. At the other end of the scale Coventry City Council looks to intervene within five days. These differences are likely to be reflective of the different types of road networks (urban/rural and the associate risks) as well as resource constraints.

Table 4.1 Five common repair times for the most urgent road defects for LHAs in Great Britain

Most urgent repair time	Number of LHAs	% of LHAs
2 hours	79	42%
24 hours	48	25%
1 hour	16	8%
4 hours	11	6%
1.5 hours	5	3%

Table 4.2 below gives a sense of how councils respond to the least troublesome defects.

**Table 4.2 Five common repair times for least urgent road defects for LHAs in Great Britain**

Least urgent repair time	Number of LHAs	% of LHAs
<b>Programmed works</b>	48	25%
<b>28 days</b>	34	18%
<b>Monitor</b>	24	13%
<b>20 days</b>	9	5%
<b>3 months</b>	8	4%

An RBA should take into account the rate at which the costs of repairs will increase with deferral.

Cambridgeshire County Council switched to an RBA in April 2018 and follows the Code of Practice for their carriageway inspection frequencies. The council labels the road defect categories as:

- 1) Emergency (repair time of 2 hours)
- 2) Category 1a (5 days – 36 hours for non-potholes)
- 3) Category 1b (21 days)
- 4) Category 2 (12 weeks)

For Cambridgeshire, the investigatory levels for carriageway potholes also vary by road hierarchy and category type. For example, a Category 1 pothole on strategic and main distributor roads has a lower investigatory level of 40mm in depth than a Category 1 pothole on a minor road which has an investigatory level of 80mm in depth (and exceed 75mm in any horizontal direction in both cases).

#### 4.4 What is a pothole? Defect intervention/investigatory levels

Most LHAs – whether operating under the old procedures or the new RBA – still have broad physical criteria for defects below which threshold action is unlikely, though a number of councils will look at anything (including the most minor damage to the road) with an eye simply to the risk it poses.

The threshold physical parameters can vary depending where a road sits in the LHA's road hierarchy. For example, a deep pothole on a country lane used only by tractors might not cross the hurdle for attention, investigation and repair while something more minor on a major route probably will.

Table 4.3 below shows the five most common 'minimum' depth-only investigatory levels for potholes used by LHAs in Great Britain (though it ignores additional width parameters which some LHAs also apply). It shows that 104 (56%) of the LHAs use a 'minimum' intervention/investigatory level that includes a depth of 40mm.

**Table 4.3 Depth only 'minimum' intervention/investigatory level for potholes in Great Britain**

Minimum criteria (depth only)	Number of LHAs	% of LHAs
<b>Risk based</b>	12	6%
<b>20-30mm</b>	37	20%
<b>30-40mm</b>	8	4%
<b>40mm</b>	104	56%
<b>45mm</b>	1	1%
<b>50mm</b>	26	14%

Table 4.4 shows the five most common ‘minimum’ intervention/investigatory level for potholes, including a width parameter used by LHAs in Great Britain. Of the 190 responses, just over a third of authorities use a ‘minimum’ pothole level of 40mm in depth, followed by 40mm depth and greater than 30mm in any horizontal direction (9%), 50mm in depth (8%), 20mm in depth (7%) and then a risk based assessment (6%).

**Table 4.4 Five most common ‘minimum’ intervention/investigatory level for potholes in Great Britain**

<b>Intervention/investigatory level</b>	<b>Number of LHAs</b>	<b>% of LHAs</b>
<b>40mm</b>	65	35%
<b>40mm, 300mm wide</b>	17	9%
<b>50mm</b>	15	8%
<b>20mm</b>	13	7%
<b>Risk based</b>	12	6%

## 5. Appendix

### FOI request questions sent to all local highway authorities in Great Britain in September 2018

Under the Freedom of Information Act 2000 I seek the following information regarding your road maintenance policy.

- 1) Does your local authority use a risk based approach to the repair of highway defects such as potholes?
- 2) If yes to Q1, when did you switch to a risk based approach? If no to Q1, what approach do you use?
- 3) How does your frequency of monitoring for highway defects, such as potholes, differ for different road types/carriageway hierarchy: as defined in *Well-maintained Highways: Code of Practice for Highway Maintenance Management* (e.g. motorway, strategic route, main distributor, secondary distributor, link road, local access road)?
- 4) In what ways is your authority alerted to or detect highway defects such as potholes?
- 5) How do you categorise highway defects, such as potholes, and how are those categories defined?
- 6) For identified highway defects, such as potholes, what are your intervention criteria?
- 7) For the different highway defects categories identified, how quickly to you aim to repair them/what is the repair schedule once they have been entered into the system?
- 8) Have your intervention criteria for highway defects, such as potholes, changed in the last 5 years? If so, please indicate when, and what the previous intervention criteria were.

If this information is available in a highways maintenance policy document, **please** provide the latest copy **(either as an attachment or link)** and **identify the page number/sections** for the answers to the above questions.