

HAMPSHIRE COUNTY COUNCIL**Report**

Committee:	Environment and Transportation Select Committee
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Report Title:	Potholes and Network Restoration
Report From:	Director of Environment

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1. Purpose of Report

1.1. This report looks at the issue of potholes on the road network. It helps define and understand the type of defects which form on the highway and the techniques available to undertake repairs. It provides some indication of the scale of the routine 'pothole' defect problem and the associated costs, defines how contract monitoring is undertaken and how future data collection might be improved.

2. Contextual Information

2.1. It is impractical and would be very difficult to research exactly how many individual defects (potholes) are repaired each year and how many are generated and evident on the network. Exact records have not been kept on individual defects but the increasing interest in this topic area highlights the need to have a better understanding of the scale of the problem and the effectiveness of repair strategies. The identification, response and repair of defects are well established and embedded in service delivery. New techniques, materials and methods are trialled but the underlying strategy of a temporary 'safety' repair followed by a permanent repair prevails, particularly in the rural parts of the network. A study of the best repair techniques was previously undertaken which underpins the current practice. It is acknowledged that the life of a pothole varies according to its situation and formation and there is a practical difference between the type of repairs on the urban and the rural parts of the network.

2.2. Pothole formation contributes significantly to the number of highway damage claims received by the service and its response to dealing with known potholes and statutory defence of any claim. Currently some 80% of the 1,000-1,500 highway related claims received each year relate to pothole type defects.

3. Highway Defects

3.1. There are many types of defect that can affect roads and verges, all of which are commonly referred to as potholes. Potholes are a global nuisance and northern Europe has suffered much like Britain this winter. They are an inevitable result of increased levels of traffic, growing use of HGVs, wetter and colder weather and an ageing infrastructure.

3.2. Types of defects

- (i) Potholes – occur when the road surface breaks up to expose the layers below. The main cause is wet weather and freeze thaw action. Freezing water causes a build up of pressure that results in the surface being ‘blown out’.
- (ii) Surface delamination – occurs when the top surface of the road debonds from the layers below. This usually causes areas of road surface to break away and are normally around 20-25 millimetres thick. Surface delamination, although a surface defect, is less of a safety issue than a pothole due to the limited depth.
- (iii) Edge defects – are different from potholes because they are caused by vehicles driving over the edge of the road and damaging the surface. The edge (or haunch) is the most vulnerable part of the road as it has reduced support from the softer verge. Edge defects are most common in rural areas of the county where kerbing is not commonplace.
- (iv) Cracking – cracking of the carriageway can occur at the edge of the road or where the underlying structural layers have been weakened, eg at trenches.
- (v) Crazing – this is where the surface of the road appears like small sections of ‘crazy paving’. This occurs when the bonding in the surfacing breaks down but the surface remains intact although loose.

4. Types of Repair

4.1. Wherever possible the road is not closed and repairs are carried out using temporary traffic controls (for example Stop/Go boards). However, it is inevitable that pothole repairs will sometimes mean closing a road while the work is done, either to protect the workers or due to insufficient road width remaining for traffic.

4.2. If the road is narrow, or the work is on a bend, the safety of pothole workers, road users and pedestrians means the road needs to be closed for health and safety reasons. When a road is closed, disruption is kept to a minimum and the road opened during peak travelling hours.

4.3. There are a variety of defect repair techniques utilised across the county road network. The type of repair undertaken depends on the location and type of defect. Techniques include:

(i) Permanent repairs:

- Infra red patching – for small areas of road, and particularly around difficult areas such as gullies and manhole covers
- Jetpatcher – effective for high speed repair work in rural locations with numerous small potholes
- Patching – hot patching is used widely across the county for larger areas
- Resurfacing – where longer sections of roads are defective resurfacing the road surface is the most effective solution
- Haunch repair - structural repair to the carriageway edge of approximately one metre width
- Verge repair - infilling with compacted limestone and topsoil.

(ii) Temporary repairs:

- Patching – cold patching is used widely across the county for potholes where site access/safety is an issue. This is undertaken by routine maintenance gangs. This method is frequently used where an emergency repair is required to repair a dangerous defect and make safe the road. It is normally followed by a permanent repair at a future date.

5. Number of Potholes on the Network

5.1. In an attempt to gain a better understanding of the level of pothole type defects, some analysis has been undertaken over the last year and there is an emerging picture that may help to establish a better base line figure.

5.2. An approximate level of defectiveness relating to pothole type defects may be gleaned from a number of sources, such as highway safety inspections, routine maintenance crews, works orders and emergency call outs, which shows that over a year there are around 100,000 pothole type defects formed. This is obviously approximate and may be considered within at least a 25% confidence limit. The level of defectiveness is very much influenced by weather conditions and an estimated additional 25,000 to 50,000 pothole type defects may be generated by weather extremes.

5.3. The number of potholes repaired in any year from the various repair methods, which include routine gangs, works orders and emergency repairs, is estimated at 50,000 to 80,000. The current annual cost of the repair

programme from the revenue budget is estimated at between £4.4 million and £5.4 million. This figure is based on reactive maintenance and planned maintenance works.

- 5.4. Resilience of pothole repairs varies. Where defects are repaired on a temporary basis the life of the repair can last up to two years, but can be considerably shorter depending on the site conditions. This is on the assumption that a permanent repair is not undertaken, which is the case for most of the repairs done by the routine gangs. An estimated 30,000 repairs are undertaken by these gangs each year. They undertake important work and are responsive to the local needs, working directly to the local engineers, and the way in which they are deployed to achieve efficiency, value for money and maximum benefit is being reviewed.

6. Contract Monitoring with Amey

- 6.1. All large planned maintenance schemes ordered and undertaken through the Department's 'special maintenance' programmes are monitored and re-measured for payment purposes.
- 6.2. Repairs commissioned work via a works order to Amey is audited up to a maximum of around 10%. Local engineers will query orders that are exceptions to the original quantities; this can be a plus or minus to the original order.
- 6.3. Pothole repairs through the routine gangs are randomly checked by the local engineers who are out and about on the road network daily.

7. Data for the Future

- 7.1. The need for improved intelligence with respect to pothole defects is recognised within the wider concept of Asset Management principles. A pilot project has begun in which the first phase was to scope the types of defect to be recorded and develop a way of accurately recording their position and the number repaired. This was seen as extremely important for planning, budgeting, trend analysis and good asset management as a large proportion of the maintenance budget is spent in this area.
- 7.2. Initial scope of the project is to identify defects requiring a reactive repair. These include verge overruns, edge defects, 'traditional' potholes, severe localised cracks and footway repairs.
- 7.3. The preliminary trial is presently looking at a low cost solution using a GPS unit to locate the site and to record the type of repair or repairs undertaken. These trials were interrupted by the winter weather and have been extended. Initial feedback identified some issues with positional accuracy, slow operating speeds and some software download issues with Amey. It may be that a low-cost solution will provide the quality of data required.

- 7.4. One routine gang in Eastleigh is continuing to collect data and the department is working with Amey to look at alternative solutions.

8. Network Hierarchy

- 8.1. The highway network is categorised by its use and function and is generally referred to as 'A', 'B', 'C' and unclassified. Motorways and Trunk Roads are the responsibility of the Highways Agency. The target condition of these roads very much follows this hierarchy; clearly high speed 'A' roads need to be in the highest condition to avoid safety problems. The network is therefore planned to be maintained to given levels of condition and these are set out in the Local Transport Plan 2. Funding has been a crucial determinant of this condition and also good Asset Management.
- 8.2. The impact of extreme weather is therefore variable. Where roads are of a high quality, and in general less susceptible to water penetration, they suffer less from extreme cold and wet conditions. Thus the worst impact of this winter is not on the 'A' roads but more on the Unclassified network.
- 8.3. Maintaining a good standard of network needs to strike a balance and, whilst it may seem desirable to have high class roads across the whole network, this may not give good value for money in overall financial terms but would avoid the pothole problems to a large extent. Wholesale improvement would require a step change in funding running into hundreds of millions of pounds but much could be achieved by an injection of funds into planned maintenance over the next five years.

9. Conclusion

- 9.1. The exact numbers of potholes and the rate at which they form is difficult to assess. Pothole formation is very weather dependent and can form extremely quickly in the road surface. The type of defect in a road can be caused by several different mechanisms and is generally grouped by the public as 'potholes' even though a lot of defects, particularly in rural areas, are caused by vehicle overrun of the road edge and verge.
- 9.2. It has been estimated that there are in the region of 100,000 potholes a year (+/-25%), with a repair cost range of £4.4 million to £5.4 million annually. This figure includes planned patching works as well as the work of the routine reactive maintenance gangs.
- 9.3. At present it is difficult to identify the exact number of potholes the network experiences, and trials are underway to develop an electronic data capture process for use by the Amey workforce that will significantly improve pothole location and type of defect recording.

- 9.4. Avoiding potholes would be a popular target but without wholesale surfacing and reconstruction of the network this is not possible. Based on the Isle of Wight's Highways Private Finance Initiative (£350 million for a network a tenth of the size of Hampshire's), Hampshire could be looking at an investment of £3.5 billion to achieve this goal.
- 9.5. It should be noted that weather forecasting is also a very uncertain process. It is therefore important that in considering managing the pothole issue, the impact of future events is not ignored. To this end the County Council is looking into a planned maintenance regime to improve highway resilience.

Section 100 D - Local Government Act 1972 - background documents

The following documents discuss facts or matters on which this report, or an important part of it, is based and have been relied upon to a material extent in the preparation of this report. (NB: the list excludes published works and any documents which disclose exempt or confidential information as defined in the Act.)

Document

Location

None

IMPACT ASSESSMENTS:

1. Equalities Impact Assessment:

1.1. No impact.

2. Impact on Crime and Disorder:

2.1. No impact.

3. Climate Change:

a) How does what is being proposed impact on our carbon footprint / energy consumption?

The increased number of random potholes across the county roads has led to additional trips by staff/contractor to deal with the problems.

b) How does what is being proposed consider the need to adapt to climate change, and be resilient to its longer term impacts?

If restoration of the network can be achieved it will increase the resilience of the road network to extremes in climatic conditions.