



**COMMUNITY COUNCIL LIAISON SUB-COMMITTEE –  
17TH FEBRUARY 2010**

**SUBJECT: EFFECTS OF SEVERE WEATHER ON HIGHWAY MAINTENANCE**

**REPORT BY: DIRECTOR OF THE ENVIRONMENT**

---

**1. INTRODUCTION**

A pothole appears due to variety of reasons whether it be surface or sub-surface failure. Potholes pose a danger to road users and pedestrians alike with increase risk of vehicle damage and injury. If left, potholes can deteriorate, increase in size and affect other parts for the road surface.

**2. BACKGROUND**

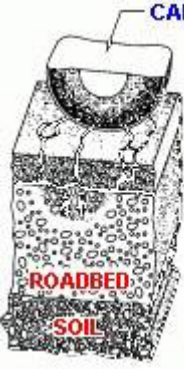
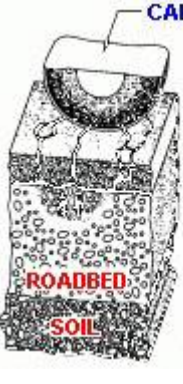
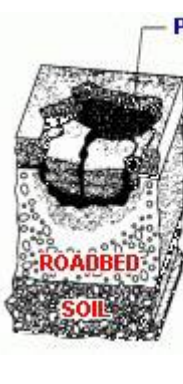

**2.1 How they form**

There are a number of reasons why potholes form in pavements, some are down to fatigue of the bituminous material, inclement weather or a mixture of both elements. The formation of the defect starts due to fatigue of the pavement surface. As fatigue fractures develop they typically interlock in a pattern known as "crazing". The chunks of pavement between fatigue cracks are worked loose and dislodge from the rest of the bituminous layer, eventually to be picked out of the surface by continued wheel loads, thus forming a pothole.

**2.2 Inclement Weather**

Probably the most damaging process that creates and accelerates pothole formation is that of the 'freeze, thaw' process from ice or snow. The water from the snow or rain enters into the ground under the pavement through the micro-cracks in the pavement surface. When this water freezes, it expands and increases in area under the pavement. As a result of this the pavement in turn will expand, bend, and crack, thus weakening the bituminous material. When the ice then proceeds to melt, the pavement contracts and leaves gaps or voids in the surface under the pavement, where water can get in and become trapped. If the water freezes and thaws over and over, the pavement will weaken and continue cracking until total failure of the bituminous materials.

## How Potholes Form

 <p style="text-align: center;"><b>CAR TIRE</b></p> <p style="text-align: center;"><b>ROADBED</b></p> <p style="text-align: center;"><b>SOIL</b></p>	 <p style="text-align: center;"><b>CAR TIRE</b></p> <p style="text-align: center;"><b>ROADBED</b></p> <p style="text-align: center;"><b>SOIL</b></p>	 <p style="text-align: center;"><b>POTHOLE</b></p> <p style="text-align: center;"><b>ROADBED</b></p> <p style="text-align: center;"><b>SOIL</b></p>	 <p style="text-align: center;"><b>HOT PATCH OR COLD PATCH MATERIAL</b></p> <p style="text-align: center;"><b>ROADBED</b></p> <p style="text-align: center;"><b>SOIL</b></p>
<p>Rainwater sinks through cracks in old or weakened asphalt. The water is soaked up by the mixture of rock, gravel, and sand that supports the road.</p>	<p>Vehicles passing over the road force water through the soggy roadbed, eventually eroding parts of it.</p>	<p>Asphalt sinks into the eroded portions of the roadbed and eventually cracks under the continued impact of vehicle tires. Chunks come loose.</p>	<p>Holes may be patched with proprietary cold patch or hot patch materials.</p>

### 3. CCBC'S HIGHWAY MAINTENANCE POLICY

3.1 Caerphilly CBC operates a highway maintenance policy, which was implemented in 1996, within this policy carriageways/ footways are classified. Within this classification document the type of highway, routine inspection intervals and defect criteria are listed (Appendix A).

3.2 CCBC undertakes 3 types of highway inspection:

- (i) Planned safety inspections - where all carriageways/ footways are inspected at 6 monthly intervals and localized busy town centre's inspected monthly. These inspections are walked.
- (ii) Non scheduled inspections - where a service request is raised via the customer care team and inspected within the relevant timeframe.
- (iii) Emergency response - these are inspections that are conducted both during and outside of normal working hours and by their nature are immediate.

3.3 As well as adhering to the safety defect criteria document, there are several considerations to be made by the highways inspector on-site prior to instigating a repair to the highway;

Is the carriageway on the resurfacing programme?

What condition is the area surrounding the defect in?

Is the section of highway heavily trafficked?

What is the most cost effective and efficient method of repair?

## **4. FINANCIAL IMPLICATIONS**

### **4.1 Costs of carriageway potholes**

Road maintenance in England and Wales is estimated to be underfunded by around 50%, or £1 billion every year. Last year it was estimated that £53m was paid out to motorists via 'third party claims' which could have been spent repairing an extra 946,429 potholes (based on costs of £56/ defect)!

The costs of repairing the carriageway potholes within Caerphilly County borough was approximately £650,000 for 2007-08. Following this latest period of inclement weather it is envisaged that this figure would surpass £1,000,000 for 2009-10.

4.2 Given the estimated increase in spending on potholes this year will be highlighted in the budget monitoring reports to cabinet in order that appropriate measures can be instigated to cover the increase in costs.

4.3 The volume of potholes currently being identified for repair has obviously significantly increased. As such, additional resources have been temporarily employed and others reallocated works in order to undertake these urgent repairs. This will obviously have a detrimental effect on the capital works programmes for footway and carriageway resurfacing due to the reallocation of the resources. This reallocation does not only apply to the workforce but also to the budgets, where consideration to remove funding out of the Capital budget and into the highway maintenance budget will be required.

## **5. SUMMARY**

5.1 If all authorities were given the budgets they need to fix their roads, it would take English authorities 11 years to catch up with the current backlog, and Welsh authorities 16 years. Also at current maintenance levels, the average frequency for a road to be resurfaced in England is once every 65 years. In Wales it is once every 81 years (please see attached recent Western Mail article).

There is no easy solution to remove the threat posed by potholes. All efforts are made to mitigate the risk posed by them by ensuring that our highway inspection and maintenance regime are adequate.