ROTHERHAM BOROUGH COUNCIL - REPORT TO MEMBERS

1.	**Meeting:**	Improving Places Select Commission
2.	**Date:**	4th September 2013
3.	**Title:**	Highway Maintenance Carriageway Defect Repairs - Multihog
4.	**Directorate:**	EDS

5. Summary

Further to the report presented to Improving Places Select Commission on 16th April 2013, this report provides members with information on the provisional results of the trials of the new method of repairing highway defects (potholes) using the maintenance milling machine (Multihog).

6. Recommendations

It is recommended that Members note the contents of the report

7. Proposals and details

An analysis of the highway safety defects repaired shows a steady increase in numbers and cost over the last few years (see table below). As these are only temporary repairs, and not cost effective, it is becoming increasingly important that an alternative method of repair had to be found; the development of the 'first time fix' approach seemed to be the way forward.

Highway safety defects range from a trip hazard on a flagstone to a major road collapse; the vast majority of the safety defects are however potholes in the carriageway. The traditional method of repairing these carriageway safety defects is by removing any loose debris and then filling the defect with 3mm surfacing material. This type of repair is not generally very long lasting with an (average) estimated life expectancy of less than 2 years, but they can also look unsightly and do not provide a smooth surface; some do fail in a relatively short period especially in winter.

The average cost of repairing a pothole using the traditional method is £14, equivalent to about £50/m^2.

Small patching works used to be carried out using a hand excavation or conveyor milling machines. Due to the change in legislation on hand arm vibration equipment the normal hand method of excavating small patches can no longer be used. We have experimented with using the conveyor milling machines, but they have large width cutting tools (not suitable for small patches) and cannot move from site to site without the assistance of a low loading vehicle; this adds considerably to the costs on each job.

Year	No. Actionable Defects	Cost (rounded to nearest £1,000)	Cost per Defect (rounded to nearest £)
2007/2008	11,638	£240,000	£21
2008/2009	12,062	£243,000	£20
2009/2010	15,624	£250,000	£16
2010/2011	28,229	£418,000	£15
2011/2012	28,347	£427,000	£15
2012/2013	32,530	£456,000	£14
2013/2014(*)	36,000	£504,000	£14

(*) forecast data

The majority of the carriageway safety defects have a response time for repair of 24 hours from the identification of the defect to completion.

In January 2012 we took delivery of a Maintenance Milling Vehicle (MMV) which has various maintenance functions, one of which was a milling attachment. The MMV is compact (about the size of a family car) and can move from site to site independently; the MMV was acquired to carry out normal carriageway patching and support the general works programme. After using this vehicle for a few months it was clear it could be also be used to carry out 'first time fix' for safety defects.

An outline for a new first time fix process was developed for use on the Unclassified, estate roads. A new response target of 48 hours was set for removing the safety defect with the follow-up patch being completed within five (further) working days; this allowed time for programming of the repair.
The detail of the protocol is in Appendix 1, and a trial using this new method was started in December 2012.

The Trial

The Trial started in December 2012, continued in January/February 2013 and restarted in April 2013 following the end of the winter maintenance season. The trial has been continuing since then.

The December trial was undertaken with one Highway Inspector (HI) and in January/February it was undertaken with two HIs. The trial restarted in April, with a rota system in place for HIs, based on the MMV moving to a different Area Assembly each month.

In the initial trial not only was the safety defect repaired, but other non-safety defects that were close by were included; during the later periods the repairs were restricted to only those associated with safety defects.

Outcome of the Trial

The extended targets for removing the safety defect from 24 hours to 48 hours is being met and has, to date, caused no difficulties.

The target for completing the patching repair of five days was more difficult to achieve and caused some planning issues; this was primarily due to the inclusion of other non-safety defects which did increase the amount of patching and, in turn, caused planning and efficiency issues. An extended target of 10 days has subsequently been used and this has improved planning and efficiency. Because the safety defect has been removed, there has been no adverse reaction to the 10 day target.

Using this method through the winter months has not proven practical; the MMV was purchased with a winter pack (front plough and rear salt spreader) and it was always the intention to use this on roads which are difficult for normal Gritters to get to (e.g. Primary Schools, Doctor's Surgeries, vulnerable people's accommodation). With the combination of lower carriageway surface temperatures, rain and using it on winter operations (this is a priority during the winter season) it did reduce its availability through the winter season.

The MMV is also used to support planned highway works and this reduces the machine's availability to carry out first time fix for safety defects.

After the permanent patch repair the safety defects are removed, the ride quality is improved and the issue of defect repairs failing is significantly reduced, however, the carriageway can look a little like a patchwork quilt. The permanent repair is estimated to have a life expectancy in excess of 10 years.

We have established that one MMV fully deployed can remove 3,100 safety defects with 11,300m^2 of high quality follow up patching at a cost of £385,000; the average cost of this method is therefore £35/m^2. In practice the MMV can only be used on this type of work for about half of the year because of its commitment to other planned works; this would mean that approximately 1,500 defects can be repaired at a cost of £190,000. This level of expenditure can be contained within the Network Management budget.

Conclusions and Recommendations from the Trial

- The cost of the new method of permanent repair (per m^2) is about 30% less than the traditional method of dealing with potholes.
- The method has a life expectancy of about 5 times that of the traditional method.
- The costs of using the spare capacity on the existing MMV can be contained within the existing Network Management budgets, but the costs of deploying additional machine(s) would create an unmanageable budget pressure.
- Undertaking permanent repairs will help slow down the rate of deterioration of the network.
- The new 48 hour target for removing the safety defect has not caused any increase in the number of claims for damage against the Council.
- The follow-on 10 day target for the completion of the permanent repair is achievable and has not caused any adverse comments.
- The permanent repair patch should be restricted to the table top size in most cases. A good example of this is shown in Appendix 2. In this example there are multiple safety defect repairs, an old patch repair and potential safety defects developing. The permanent repair patch removes all of these and has lasted through one winter without any signs of deterioration.
- The MMV shall be used to support Winter Service and other general works.
- The roads where this protocol has been used should be placed on the proposed surface treatment list for consideration in the following year to improve the road quality and appearance.
- The new protocol is included in our Code of Practice for Highway Inspection and Assessment.
- That funding opportunities are investigated to support both the traditional safety defect repair method and the addition first fix method.

8. Finance

The costs of operating the existing MMV are being contained within the Network management budget however there is no scope to expand the programme at present. The Government's long-term spending plan has been set out for 2015/16 to 20120/21 and we expect to see an increase in our Maintenance allocation of around 30%. If the DfT formula remains the same we should get approximately an addition £570,000 for Rotherham; this money could then be considered for supporting an expanded MMV programme.

9. Risks and Uncertainties

These are covered by the Code of Practice for Highway Inspection and Assessment.

10. Policy and Performance Agenda Implications

The condition of the roads is a key priority for the coming year as set out in the Corporate Plan

- Improving the environment
  - Safe and well maintained roads

11. Background Papers and Consultation

Code of Practice for Highway Inspection and Assessment

Code of Practice for Highway Maintenance Management, "Well Maintained Highways" published July 2005

12. Contact

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APPENDIX 1

Original PX/P5 Protocol

Within the current Code of Practice there are two responses for dealing with safety defects;

- **Priority A** - Used to deal with defects which form an immediate hazard to the highway user. Action will be instructed by telephone from the site. This may also be used when works are identified as part of a third party claims investigation. Defect to be repaired =< four hours from identification.
- **Priority 1** - See definition in guidance on Safety Inspections. This category is also used to react to customer generated reports of urgent defects. This may also be used when works are identified as part of a third party claims investigation. Defect to be repaired =< 24 hours from identification of defect.

The majority of these defects are identified whilst carrying out cyclic safety inspections. Additional defects are identified when carrying out ad-hoc inspections or from customer reports.

On identification these safety defects are passed on the Highway Delivery Team (HDT) by phone and a back office process is completed later. This method works well and meets the requirement of the national guidance and underpins our third party claims defence.

There are a number of problems with this existing method:

- Due to the number a first fix is not being achieved.
- The standard of repair has been called in to question.
- The number of repeat repairs is rising.
- Safety defects arising at the side of existing repaired defects.
- Inefficient use of Highway Inspector (HI) and HDT resource.

In order to address the above a new method is proposed.

To be able to adapt to a new system of working the response time taken to repair defects must be extended from 24hrs to 48hrs. This will enable more efficient planning of works. The new 48 hour response time has been endorsed by the Council's insurers along with the solicitors and barristers that are used to represent the Council with respect to third party highway claims.
Improvements in the quality of the repairs are also required and the Maintenance Milling Vehicle (MMV) will provide a quick and efficient method of excavating the highway to accept better quality material and repair methods. This will significantly reduce the number of repeat safety repairs at a location.

To reduce the number of safety defects appearing close to an existing safety repair, it is proposed to expand the area immediately adjacent to an identified safety defect to include future potential safety defects.

Identification, Categorising and Risk Assessment

The existing procedure of generating cyclic, ad-hoc and report inspections will not change. If the defect is assessed as a Priority A (4hrs) then this defect will be actioned as previously.
If a Priority 1 (24hrs) defect is identified then a further risk assessment will be carried out on site.
The defect location needs to be considered. Higher risk locations such as; schools, doctors, hospitals, high traffic volumes (vehicle/foot), vulnerable people, Permit Street, etc. will place this defect in the existing Priority 1(24hrs) category.
All other defects will be placed in the new Priority X (48hrs) category, the close surrounding area need to be assessed. The methodology is to include any past temporary repairs and any other defects that could become hazardous in the near future. The completed repair should be of a “table top” size.

Stage 1

The HI marks the PX and the follow-up P5 patch. The PX is rung through to the HDT. The PX and P5 works detail is recorded and an order sent to the HDT.

Stage 2

The HDT use the order to plan the works.

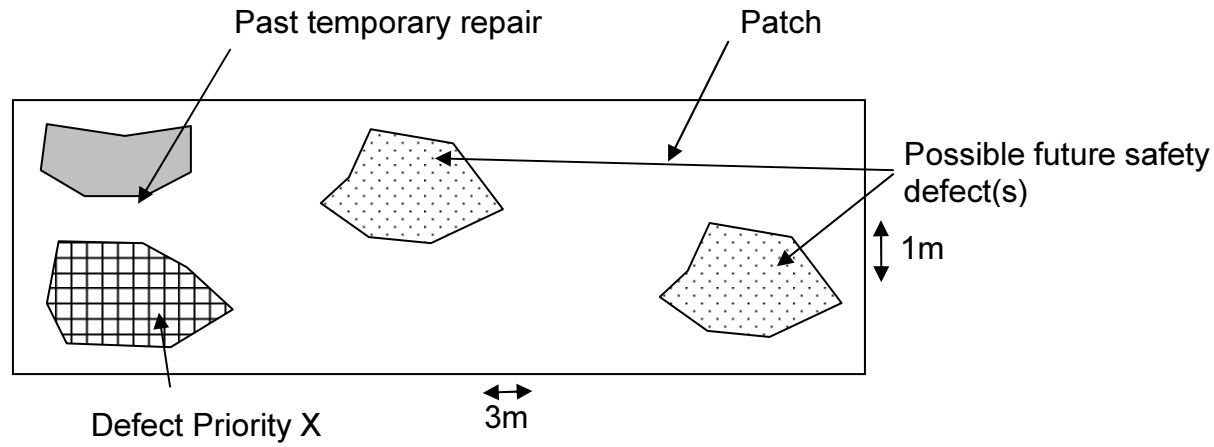
Stage 3

The MMV removes the area identified in the P5 patch, which includes the PX, to a depth not exceeding 30mm. The patch is swept to remove the milled surface material and any other debris. The remaining depth below the base patch layer is filled in to remove the PX safety hazard.

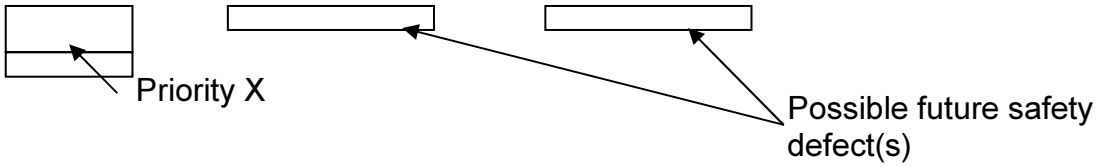
Stage 4

The P5 patch is surfaced.

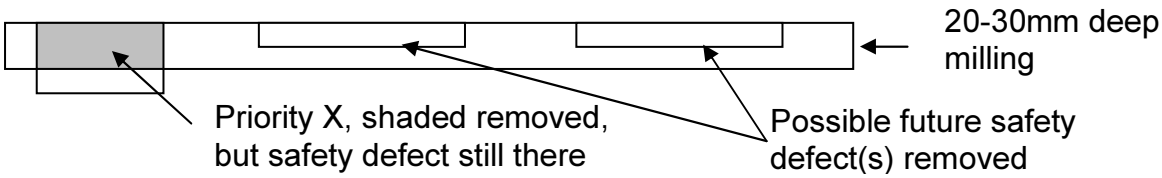
Plan View at Stage 1



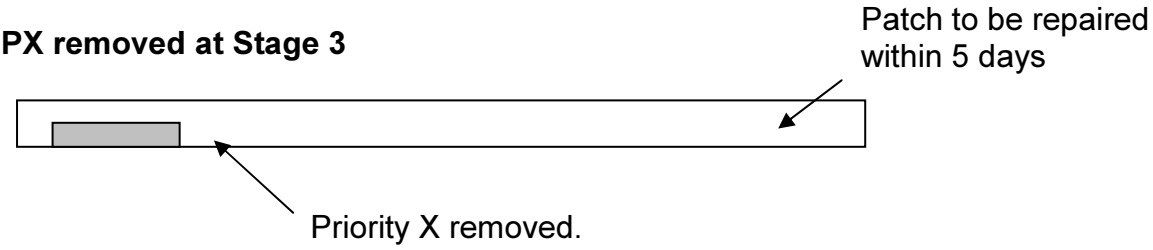
Side view at Stage 1



Side view at Stage 3

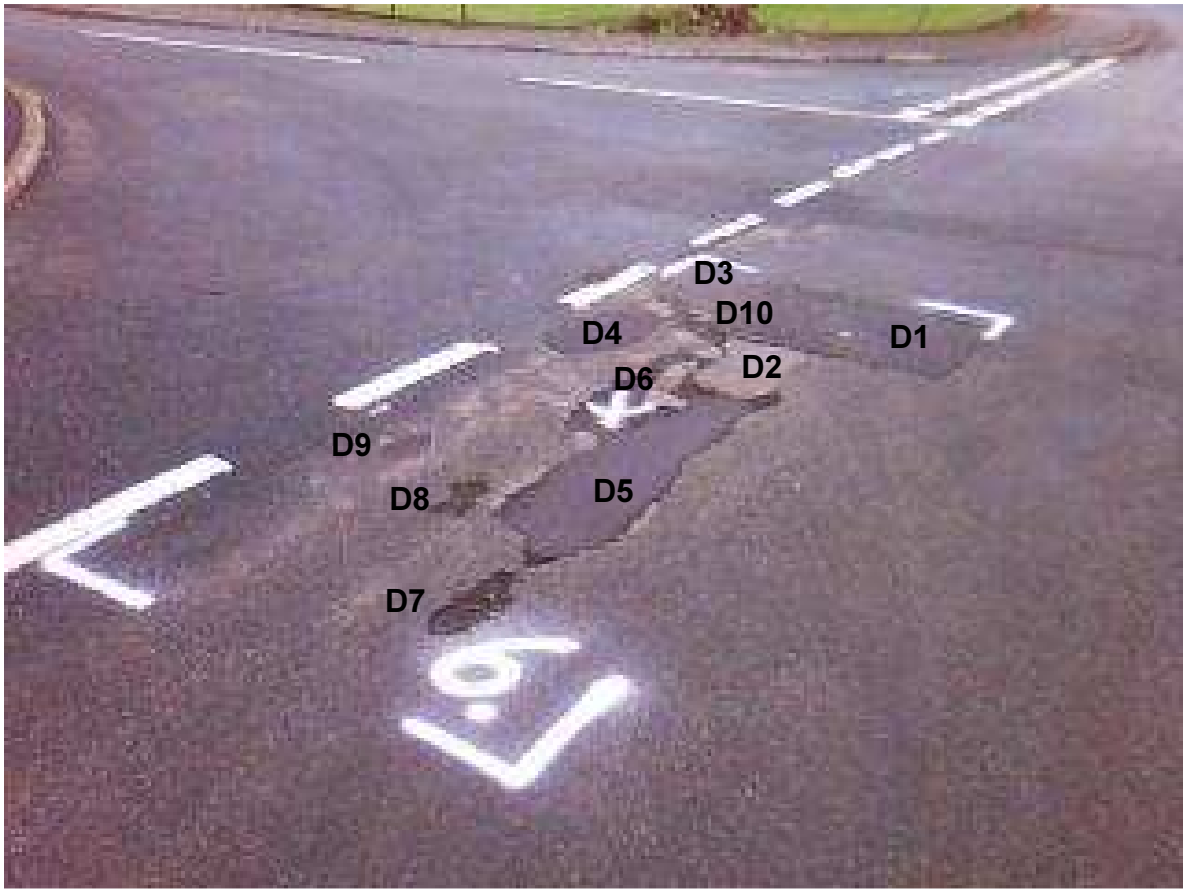


PX removed at Stage 3



APPENDIX 2

Before (December 2012)



D1 is permanent patch carried out by a Statutory Undertaker (gas, water or electric) prior to 2010.

D2, D3, D4 and D5 are previous safety defects repaired in the 12 months prior to the P5 patch costing around £56.

D7, D8, D9 and D10 are potential safety defects, costing around £56.

D6 and area marked with white 6 is the new PX/P5 repair, costing around £140.

After (July 2013)

This shows the P5 patch has not deteriorated during the winter season.