
**Manchester City Council
Report for Resolution**

Report To: Communities and Neighbourhoods Overview and Scrutiny Committee – 16 November 2010

Subject: Highway Defect Inspection, Repair and Quality Control Procedures

Report of: Director of Neighbourhood Services and Interim Head of Highway Services

Summary

This report explains how road repairs are coordinated, the quality of work monitored, and how contractors are held to account if they carry out unsatisfactory repairs. This report also explains the related arrangements for highway inspection and response times for minor highway defect repairs and how quality and performance is controlled. Progress to date on new trial 'find and fix' and 'report and fix' procedures and an innovative pothole repair system is also discussed.

Recommendations

It is recommended that Members note the content of the report including the various procedures, controls and performance measures associated with highway inspection, response times for defect repairs, arrangements for the coordination of works and quality control for the repair of potholes.

Highway Services are committed to improving the Reactive Maintenance Service and Members are also requested to note the relative success of the three different inspection and repair procedures and the Nu-Phalt pothole repair trial which has taken place.

Wards Affected: All

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Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

- Highways Act 1980
- Highway Services (Maintenance) Code of Practice for Highway Safety Inspections
- Code of Practice for Highway Maintenance Management entitled 'Well-maintained Highways' published by the Roads Liaison Group 2005
- Report to the Communities and Neighbourhoods Overview and Scrutiny Committee Winter Services Subgroup of 5th October 2010.
- Report entitled 'Highway Maintenance' submitted to the Communities and Neighbourhoods Overview and Scrutiny Committee in November 2009.

1. Introduction

- 1.1. At the Winter Services Subgroup Meeting held on 31st August 2010, Members requested more detail of how road repairs are coordinated, the quality of work monitored, and how contractors are held to account if they carry out unsatisfactory repairs and this report addresses these issues.
- 1.2. In addition, this report explains the related arrangements for highway inspection and response times for minor highway defect repairs and how quality and performance is controlled. Highway Services and Manchester Contracts have also been trialing a number of efficiency initiatives such as 'find and fix' and 'report and fix' procedures together with a new pothole repair system and the findings to date are explained.

2. Highway Inspection

2.1. Duty to Inspect the Highway

The Highways Act 1980 (Section 41) imposes a duty upon Highway Authorities to maintain adopted highways in a satisfactory condition and the vast majority of claims against the authority allege a breach in this duty. In order to defend claims, the Council needs to be able to demonstrate that it has adequate procedures for the inspection and maintenance of highways. The Council has established a 'Code of Practice for Highway Safety Inspections' based upon national standards, which defines road, footway and cycle-way hierarchies, inspection procedures, frequencies of inspections, the recording of actionable defects, risk management and the response time for the prioritised repair of defects.

2.2. Inspection frequency

The frequency of inspection is based primarily on the level of use and importance of the section of highway in question. In general, all highways are inspected at six monthly intervals however, principal routes are inspected at three monthly intervals and the City Centre and busy parts of district centres are inspected on a monthly basis.

2.3. Intervention Levels

With effect from 30th November 2009, Highway Inspectors are required to record and action footway defects deeper than 20mm and carriageway defects deeper than 30mm on busy City Centre Streets and at well used road crossing points elsewhere in the City, but the intervention level for all other highway locations is 25mm in the footway and 40mm in the carriageway. Prior to this date the intervention level had been 20mm and 30mm for footways and carriageways respectively throughout the whole of the City. The intervention levels adopted by the Greater Manchester Districts are all slightly different however, the decision to slacken Manchester's levels brings them more in line with the values used by the other districts. The change also means that expenditure on the repair of defects is not being incurred any sooner than is

necessary to offer a defence against accident claims.

2.4. The impact of changing the intervention levels has been minimal. Only a few weeks worth of inspections to the new standards took place prior to the Christmas period which saw the onset of the severe winter freeze. The resulting ice damage to the highways meant that there was no discernable reduction in the number of pot holes requiring repair due to the change in intervention levels.

2.5. Highway Inspection Training and Accreditation

The role of Highway Inspectors is critical in providing the Authority with a defence (Section 58 of the Highways Act 1980) against claims relating to alleged failure to maintain the public highway. Highway Inspectors are required to attend a training course, one day a week for six weeks, and pass each module, in order to gain the Inspector Modular Training and Assessment Certificate (IMTAC). The training syllabus covers:

- Highway Maintenance Policies and Codes of Practice.
- Safety at streetworks including traffic control and signing of road works.
- Highway Act Enforcement including powers associated with mud on highway, danger, nuisance and annoyance, unauthorised signs, obstructions, dangerous forecourts, driving over footway and verges, dangerous retaining walls, illegal crossings and discharge of water.
- Legal duty to maintain the highway and local authority's defence.
- Highway Defect Recognition including hierarchy, inspection and intervention levels.
- Measurement and estimation including irregular areas and volumes.
- Materials Recognition including technical terminology, construction design principles, specification and precise description.
- Legal Investigations and Court Proceedings including giving evidence in court.
- Customer Care and Service Standards.
- New Road and Street Works Act appreciation and enforcement.

During the minimum six week training period the trainee would accompany experienced inspectors in order to learn, practice and gain experience under supervision. The duration of training under supervision would depend upon the aptitude of the trainee. Practical/trade experience in highway construction although not essential, is of particular benefit.

At the same time as highway inspectors undertake safety inspections as previously described, they also rate the condition (on a scale of 1 to 9) of every footway and carriageway they walk along. This visual condition inspection is one which highway inspectors are qualified to carry out from their training and provides a valuable rating as to the overall condition of the Council's highway asset.

2.6. Highway Inspection Quality Checks

The Reactive Maintenance Supervisor carries out weekly quality checks involving the selection of 15 minor repair job sheets (often with multiple defects on) and visits site with the respective highway inspector. The site visit is in effect, an on-the-job one-to-one meeting whereby the supervisor has the opportunity to check that each defect has been satisfactorily repaired, whether it was correctly identified and described in terms of size, material type and location. The site visit is also an opportunity to check to see that no other defects in the road have been missed and that there is consistency in how the 12 inspectors are identifying actionable defects.

3. **Response Times for the Repair of Defects**

3.1. A directorate performance dashboard was created earlier this year, the aim of which is to illustrate the direction of a series of key KPIs that are linked to the strategic objectives of the directorate. The overall target for Highway Services is to achieve 85% by the end of 2010/11 and 90% by the end of 2011/12.

3.2. Highway Services' Maintenance Code of Practice identifies response times for attending to defects based upon risk assessment principles. The code also follows National standards. No individual performance targets have been set other than to meet the 85% target referred to above.

3.3. Emergency Defects

A number of service standards were established when Environment on Call began receiving highway reports from members of the public. Emergency Defects are considered to be situations where there is an immediate danger to life and limb requiring resolution or making safe as soon as reasonably possible e.g. missing drainage cover, cavity or road collapse, oil or diesel spillage, vehicle damage to guard railing and signs, flooding or any other highway report judged sufficiently serious by an Environment on Call Operator to warrant a two-hour response.

3.4. The long established performance measure for emergency reports is to make safe within 2 hours of being reported. Performance figures for September 2010 show that 442 such defects were attended by Manchester Contracts and that 88% were attended within 2 hours, thereby exceeding the Highway Services 85% KPI. The majority of the time Manchester Contracts deploys a single two-person Mobile Team to attend to highway emergencies. The primary reason for 12% of reports failing to be made safe within two hours is due to two or more incidents being reported in different parts of the City at the same time. The response to emergency reports rarely exceeds 4 hours. The 88% success rate could be improved by the deployment of a further gang however this option is not judged to be cost effective.

3.5. Highway Services and Manchester Contracts always strive to deal with emergency reports as soon as is practically possible. However, it is not possible to achieve the two hour services standard at all times for the reasons

given and without deploying further resources, and the two hour service standard whilst being a reasonable aspiration, is unlikely to be met 100% of the time.

3.6. All Other Defects

The Highway Maintenance Code of Practice defines two other categories of defect apart from emergencies. Reports from the public are prioritised by Environment on Call in accordance with standards agreed with the service.

3.7. Code of Practice Category 1 Defects requires prompt attention because they represent an immediate or imminent hazard or because there is a risk of short-term structural deterioration. Category 1 reports are inspected within one working day and repaired or made safe within a further working day.

3.8. All other actionable reports are classified as Category 2. Category 2 reports are inspected within three working days and repaired within five working days in the City Centre and at main roads and busy pedestrian areas. For all other locations the repair period is ten working days.

3.9. Customer Resource Management System (CRM) performance figures for September 2010 show that 91% of the 689 non-emergency Category 1 and 2 defects reported via Environment on Call were dealt with within the required response times, thereby exceeding the Highway Services 85% KPI.

4. **Trial Inspection and Repair Procedures**

4.1. 'Find and Fix' Initiative

Manchester Contracts defect repair gangs repair pot holes which have been scheduled. With effect from 5th July 2010, whilst in a vicinity repairing potholes, Manchester Contracts are now empowered to repair other defects which they come across and which are not on the work schedule. The objective is simply to fix a pot hole there and then, rather than pass it by, only for it to be reported and Manchester Contracts having to revisit the same location.

4.2. During the 14 weeks since the start of this initiative, there have been on average 8 defect repair gangs deployed and they have found and fixed 37 non-scheduled actionable defects. This averages at 2.6 additional defects found and repaired per week.

4.3. This is a common sense initiative which has proven simple and effective to instigate. It has also demonstrated that relatively few defects are being missed by the highway inspectors and serves as a further check on the inspectors' performance.

4.4. 'Report and Fix' Initiative

Traditionally, all pot hole reports received from members of the public via

Environment on Call have been issued to Highway Services' Reactive Maintenance Hub which directs a Highway Inspector to check that a repair is actually required and that there are no other related issues such as statutory undertakers' works or extensive surface deterioration warranting different action to that of a pot hole repair, before issuing an instruction to Manchester Contracts to carry out. It has been established that the majority of pot hole residents' reports hit the intervention level and require a straightforward repair.

4.5. With effect from 9th August 2010, all pot hole reports received from members of the public have been referred directly to Manchester Contracts by the Reactive Maintenance Hub to action a repair. In the first 9 weeks, Manchester Contracts have received 111 reports without a highway inspector having first checked them out and the average time taken to complete the repair has been 5 working days from receipt of report. This represents a significant service improvement in terms of time scales when compared with the previous arrangements where the service standard allowed 3 days to inspect followed by up to 10 days to carry out a repair.

4.6. In future, Manchester Contracts' gangs shall measure the depth of the reported pot hole before carrying out a repair. This will serve to provide information about the number of pot holes we are repairing following receipt of a resident's report which we wouldn't have previously undertaken if the report had first been investigated by a highway inspector.

4.7. 'SEM Inspect before Fixing' Initiative

A further trial has recently started in the Harpurhey Ward whereby instead of a resident's pot hole report being checked out by a highway inspector, the report goes from EoC to the Street Environment Manager (SEM) to carry out an on-site check. If the SEM decides that the report is an actionable defect then an instruction to repair is issued to Manchester Contracts via Highway Services Reactive Maintenance Hub (see 5.4). The SEM advises the customer of the proposed action and timescales and also when the work has been carried out.

4.8. This trial only commenced on 13th September and it is too early to report findings. Fundamentally, the role of the SEM replaces that of the Highway Inspector in dealing with residents' reports and hence there are not likely to be the benefits presently being achieved by the 'Report and Fix' trial. However, looking ahead to possible options under Neighbourhood Services Internal Transformation and the aspiration for service delivery at a local level, a variation upon this initiative may have a role to play.

4.9. Section 2.5 of this report explains the training and accreditation requirements for highway inspectors which are necessary to enable the Council to robustly defend claims against the Council. A limitation of the trial is that SEMs don't possess the necessary highway inspections skills. Also, the present trial only relates to pot holes and not other types of highway defect. SEM identification of highway defects might set a precedent and compromise the Council's

defence of accident trip claims in court on the grounds that in identifying some actionable defects and not others, the Council was failing in its statutory duty. The implications of these issues need to be fully explored.

5. How Road Repairs are Coordinated

- 5.1. During the first six months of 2010/11, 10,100 carriageway and 9,262 footway minor defects such as potholes and flagging trips have been identified and repaired. The majority of these are identified by routine highway inspection and the rest from reports.
- 5.2. In addition to the reactive repair procedures, Highway Services also manage programmes of planned road and footpath reconstruction and resurfacing schemes.
- 5.3. Under Phase 2 of the Highway Services' Service Improvement Project a Reactive Maintenance Hub was established comprising of four Reports Assistants. The primary role of the Hub is to receive highway maintenance reports electronically from Environment on Call, instigate appropriate action, liaise with the customer and update call ticket history. In September 2010 1,131 reports were actioned by the Hub including 442 emergency reports of all types, 323 surface and ironwork defects, 235 drainage, 90 road marking and signs and 41 others.
- 5.4. In the case of footway and carriageway surface defects, staff in the Hub check the location of the defect against a schedule of planned maintenance schemes and unless there is a planned maintenance scheme which is imminent and will resolve the report within the intervention period stipulated by the Code of Practice, arrangements are made to carry out a minor repair. Service standards require that defects are repaired within one, five or ten working days as explained in Section 3 above and compliance is fundamental to the Council's defence of accident trip claims. However, there is clearly a balance to be struck; on the one hand we don't want to be wasting money and repairing defects unnecessarily but equally, we don't want to be exposing the Council to potential risk of accident claims for the sake of incurring a small cost to repair a defect.
- 5.5. Permanent appointments to the Reactive Maintenance Hub were only made in September 2010 and further work is required to improve procedures including the coordination of reactive maintenance and planned schemes.

6. Quality of Repairs

- 6.1. To ensure the delivery of high quality, value for money services, Manchester Contracts has implemented a quality management system (QMS) which meets the requirements of the ISO9001: 2008 International Standard. Manchester Contracts utilise systems for the monitoring, measurement and analysis of works to ensure they comply with the specification and meet the requirements of the QMS. In relation to minor works patching, pot hole and trip repairs, Manchester Contracts quality check

a random 10% sample of the works undertaken each month. Results indicate that the majority of repairs meet the required standard with any failures being reissued for rectification at their own cost. In addition to these quality checks, the gangs are also directly supervised by one of Manchester Contracts Highway Construction Supervisors, who visits each team daily to ensure that the repairs are completed to a satisfactory standard.

- 6.2. During periods of heavy workload, Manchester Contracts bring in additional resources from its sub contract partners. In the case of patching, the company utilised is Kenny Bros. Ltd., who have their own quality management accreditation to ISO 9001:2008 and are able to demonstrate quality standards comparable to Manchester Contracts. Up until November 2008 almost all patching works were undertaken by Kenny Bros. with Manchester Contracts own resources deployed mainly on highway improvement works and footway reconstructions. Up until that time approximately 65% of Manchester Contracts income was generated by highway improvement works, with the remaining 35% coming from highway maintenance activities. During the financial year 2008/09 this apportionment of work swung the other way and the trend continues with the greater proportion of Manchester Contracts' works now being associated with highway maintenance. This resulted in a change of strategy within Manchester Contracts and the way its labour resources were deployed. In November 2008, Manchester Contracts brought the patching works back 'in house' with an average of 8 of their own gangs undertaking this work on a weekly basis. Patching work is now only sub contracted to Kenny Bros. when the defect numbers generated by Highway Inspectors exceed the capacity that can be completed by Manchester Contracts own gangs, within the KPI timeframe.
- 6.3. At present, three gangs from Kenny Bros. are employed on repairing defects compared with six gangs from Manchester Contracts. The 10% sampling undertaken by Manchester Contracts as part of their QMS compliance procedures also includes Kenny Bros.' work and the quality checks haven't identified any serious problems. With a relatively small sample there is clearly scope for sub-standard repairs to be missed however, the occurrence of poor quality repairs hasn't been sufficiently prevalent for Manchester Contracts to justify deploying additional staff to carry out a greater proportion of quality checks.
- 6.4. The extent to which potholes and other surface defects arise is symptomatic of the state of the highway. Prompt repairs are essential in order to safeguard against vehicular collisions and compensation claims against the Council. The area of repair ordered by Highway Inspectors is limited to defects meeting the current intervention levels of 30mm and 40mm depth in the carriageway and tends to disregard other developing problems unless critical, due to budget pressures. As a result, it is often the area immediately adjacent to the repair that fails and becomes a further pothole. In most cases this is not the result of poor quality workmanship or materials not to specification, but the limited nature of the repair itself. This problem, together with a trial solution is discussed in part 8 of this report.

7. Reinstatement Quality Standards which apply to Statutory Undertakers

- 7.1. A detailed Highway Maintenance Report was submitted to the Overview and Scrutiny Committee in November 2009, part of which considered the issues in relation to reinstatement of the highway following disturbances by utility companies. The report concluded that overall, utility company performance in relation to reinstatements is high and that there is a willingness of the utility companies to cooperate with the City Council in improving the public realm through first pass permanent reinstatements in the City Centre. However, the report also concluded that there is still room for improvement and officers continue to work with the companies on improving their internal quality management processes.
- 7.2. Statutory Undertakers must comply with a number of requirements including the national specification for the materials to be used, and the standards of workmanship to be observed when reinstating the highway. The performance of utility companies' works has remained consistently high, with all being 95% or above over the last four years.
- 7.3. The City Council uses its powers to inspect utility companies' works for which the companies are required to pay a nationally prescribed fee. However, performance assessment is only based on visual inspection to check that the surface profile and finish are in tolerance within two years of the reinstatement date. The Council could if they wished, take core samples of utility company reinstatements in order to check that the thickness and specification of the various layers is compliant. However, the related costs would have to be borne by the Council unless a reinstatement is found to be out of tolerance in which case the costs could be recovered from the utility company and the Council can issue a defect notice on the works and can undertake a further three paid defect inspections to ensure that the remedial works are undertaken satisfactorily. As a result, recent practice has been to only undertake such testing to gather evidence to prove non compliance where this has been disputed by a utility company. Undertaking further coring tests could prove to be cost effective in reducing the transfer of non compliant reinstatements to the Council in the long term, however, this comes with the risk of committing expenditure to testing which may not be recoverable.
- 7.4. A.G.M.A. is presently developing a business case for undertaking a Greater Manchester wide coring programme. It is hoped that economies of scale will enable councils to undertake more coring tests and thereby drive up the standard of utility reinstatements. The aspiration is for the initiative to be self financing at a Greater Manchester level.

8. Nu-Phalt Infrared Pot Hole Repair System

- 8.1. We can expect to have to repair 20,000 carriageway pot holes in 2010/11. A problem recognised by local authorities is that a significant proportion of pot hole repairs don't last as long as we expect and hence, a lot of carriageway

defects may in fact be failed pot hole repairs from previous years although it is not possible to quantify the numbers.

- 8.2. There are a number of reasons for premature pot hole failure. Pot holes often arise where there is concentrated wheel loading and hence, the repair is subject to the same extreme levels of stress as the original material which failed. Sometimes it isn't the actual repair which fails first but fretting or crazing of the adjacent surface resulting in the formation of a larger pot hole. Potholes can occur as a result of a failure of the road foundation and hence, a localised repair of the surface should only be regarded as a stop-gap solution. Pot hole repairs adjacent to ironwork are also prone to premature failure. The traditional approach to repairing pot holes by its very nature, cannot achieve results which match the original surfacing in terms of durability.
- 8.3. Highway Services and Manchester Contracts have explored alternative pot hole repair materials and methods and this year, have achieved success with the patented Nu-Phalt Infrared Road Repair system. The system basically involves heating a one square metre area of failed road surface to a temperature of 200 degrees centigrade which melts the surface so that it can be raked. Supplementary hot asphalt is added to replace the pothole void together with a rejuvenating binder. The soft material is mixed and raked level in the road patch and rolled flush. Heating of the surrounding road surface is felt to be critical to achieving strong adhesion at the joint.
- 8.4. The trial began in July and after the initial on-the-job training, Manchester Contracts operated the equipment with their own operatives. The equipment has been tried on different types of road surfacing on both residential and busy main roads and has been used to repair different types of defect. Various types of supplementary asphalt materials have also been used to try and achieve savings.
- 8.5. The cost of repairing minor carriageway defects utilising the Nu-Phalt system is in the order of £60 per square metre compared with a unit rate of £40 for the traditional method. Whilst a Nuphalt repair costs 50% more than a conventional repair, if it lasts twice as long there is a clear benefit.
- 8.6. Highway Services and Manchester Contracts are so far impressed with the Nu-Phalt system and consider that it provides a superior repair which should last longer than the conventional repair. The locations where it was found to work best are in those areas where several defects exist relatively close together, this alleviates the necessity to set up the equipment to undertake a repair, then allow to cool down, de-rig and pack away to travel to the next location. There is no waste to dispose of since material is recycled, no noisy jack hammering and the equipment is contained in a single van.
- 8.7. The system does however have its limitations. It does not work well in the rain because it generates lots of steam. It cannot be used on anti-skid material and when tried on red and green coloured surfacing it gave off lots of fumes. The time taken from finishing a repair, packing away and setting up in another

street is a draw back.

8.8. On balance, the Nuphalt system definitely has its uses but it is not presently considered a viable wholesale alternative to conventional pot hole repairs.

8.9. The Nu-Phalt equipment was off-hired at the end of October having completed repairs to the cost of £90k. Repairs shall now be monitored to see how they withstand both traffic loading and the affects of next winter. Favourable performance is likely to result in further use of this system next year.

9. Conclusions

9.1. Routine Highway Inspections are being undertaken with a good degree of consistency and accuracy. However, the process is paper based requiring all defects to be recorded by hand, issued for repair in the form of paper instructions and duly filed when complete. Corporate IT are pursuing the introduction of a mobile working 'paperless' pilot for Neighbourhood Services and the expectation is that an IT solution will reduce the number of inspectors required.

9.2. The 'find and fix' trial (repair of defects thereby avoiding the need for them to be reported) and the 'report and fix' trial (significantly reduced response times) have yielded some 'quick win' benefits. These trials will continue and be expanded wherever yields the greatest benefits. These trials will inform the detailed design of the Neighbourhood Services Internal Transformation Programme.

9.3. Sample checks have shown the quality of pothole repairs to be good, however, this conclusion is based upon a 10% sample and there is clearly scope for sub-standard repairs to be missed. Highway Services welcome reports providing specific details of poor pothole repairs so that they can not only be rectified but measures taken to ensure that such failings are not repeated.

9.4. Pothole repairs are, by their very nature, a 'patch', and often symptomatic of more serious underlying carriageway problems. The life of pothole repairs is often felt to be too short for a variety of reasons as explained in the report which lead to the trial of a proprietary system. Initial results suggest that the Nu-Phalt pothole repair system is an effective process for the repair of minor carriageway defects, however it is not without its draw backs. The performance of repairs will be monitored over the winter. Highway Services and Manchester Contracts will be watchful of further innovative pot hole repair processes and will conduct trials where judged worthwhile.