Highway Inspection and Maintenance Procedures

Review by Derbyshire County Council - Improvement and Scrutiny Committee – Places

Final Report of the Review Working Group

11 March 2015

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Acknowledgements –

The Chair and Members of the review working group would like to thank the Members and Officers of Derbyshire County Council who have contributed to this review and also Members and Officers from Leicestershire County Council who shared their experiences and knowledge in the review process.

1. Background to the Review

The Improvement and Scrutiny (I & S) – Places Committee agreed, at its meeting on 21 May 2014, to undertake a review of highway inspection and maintenance procedures in Derbyshire. Members determined that the review would consider the current system of highway inspection and repair, take the opportunity to view (on-site) highway inspections and compare the process with that used by other highway authorities. A working group was established, on 16 July 2014, to undertake the review. The Members appointed to the working group were Councillor Kath Lauro, Councillor Trevor Southerd, Councillor Janet Hill, Councillor Simon Spencer and Councillor Beth Atkins. Subsequently, in November 2014, Councillor Southerd was appointed Deputy Cabinet Member for Highways, Transport and Infrastructure, and therefore stepped down from his position on the working group and the I &S Committee. Both these vacant positions were filled by Councillor Michelle Booth.

At its preliminary meeting, on 5 August 2014, the working party agreed the following objectives for the review:

- To examine the effectiveness of the methods and processes employed by the Council to monitor and maintain the condition of highways for which it is responsible.
- To examine the timeliness and effectiveness of the Council's response to defects reported by the public.
- To identify and learn from best practice examples of highway inspection and maintenance processes employed by other Councils.

This report summarises the work carried out by the working group and (in section 8, page 17) puts forward the recommendations of the review.

2. Evidence Gathering

A series of working group meetings were scheduled to gather information about the following:

- The current highway inspections process
- Management of reported highway defects
- Allocation of reactive maintenance work and the role of the Highway Control Centre
- Timeliness and effectiveness of the Council's response to reported defects
- Future developments – including the Single Asset Management System (SAMS)
- Strategic issues and performance

Members of the working group also attended:

- A site visit to Stonegravels and Willington Highway Depots which provided the opportunity for Members to talk to employees based in these area offices, witness a driven safety inspection and observe defects being repaired by road gangs.
- A site visit to Leicestershire County Council Highway Department to learn from their experience of establishing a Highway Control Centre, introducing mobile technology to inspectors and road gangs and improving the timeliness and efficiency of reactive repairs.

A full list of the topics considered at each working group meeting and the witnesses interviewed are detailed in Appendix 1 of this report.

3. Overview of Current Practices

Legal framework

The Highways Act (1980) places a duty on the Council as the Highway Authority to maintain the public highway. Under the Act, the Council is responsible for the safe passage of traffic and maintenance of all roads in Derbyshire, except motorways and trunk roads.

Operational framework

The highway maintenance role of the Council can be broken down into three main functions:

- Identification of the work required
- Planning, co-ordination and scheduling work
- Physical completion of the work

It should be noted that the focus of this review was reactive maintenance. The review did not consider planned maintenance programmes where technical assessments are used to determine a co-ordinated plan of highway maintenance across the County. Planned maintenance programmes form a large proportion of the Department's work.

3.1 Identification of work required

The Council is made aware of highway defects through customer reports and scheduled highway safety inspections. The Council also commissions regular road surveys to assess the condition of the County's road network.

The public can report road defects by emailing or phoning Call Derbyshire, by completing an on-line form available on the Council's website or by contacting their local County Councilor.

Highway safety inspections follow the procedures set out in *DCC's Highway Safety Inspections Manual*. This manual reflects the recommendations in the national guidance (*Well Maintained Roads - Code of Practice for Highway Maintenance Management*) and latest standards adopted by members of the Midland Service Improvement Group (MSIG). The manual sets out:

- the frequency of inspection,
- the method of inspection,
- what defects should be recorded
- the methodology for evaluating the risk associated with a defect.

Highway inspectors are trained to a nationally recognised standard known as "Lantra" and undergo a refresher course every 3 to 5 years.

All defects, whether notified by a member of the public or identified through a highway inspection, are logged on to the Councils highway asset management system known as "Confirm" and are forwarded to the most appropriate officer for consideration and action.

Network hierarchy and frequency of inspection

Each part of the network is assigned a hierarchy which relates to its importance to transportation and its usage. A road's position in the hierarchy will determine the frequency of inspection. For example, a strategic route is scheduled to be inspected monthly whereas a local access road would be inspected annually. Where the frequency specified in the DCC manual deviates from the frequency specified in the national guidance these changes are ratified by Cabinet.

Method of inspection

Inspections can be driven or walked. Driven inspections have to be conducted by two people: one driving and one inspecting. An appropriate vehicle has to be used with roof mounted flashing beacons and high visibility reflective markings, as a minimum, and the vehicle must be driven at an appropriate speed. During the inspection defects are recorded on a hand-held computer (Toughbook) and are transferred to the Confirm system.

Defects recorded

A wide range of defects are recorded including; debris on the highway, spillage's, potholes, overhead wires in a dangerous condition, damaged kerbs, standing water, traffic signs in poor condition, overhanging vegetation. This list is not exhaustive, further examples are provided in the manual.
A highway safety inspection is not intended to be a detailed inspection of public rights of way, street lighting or trees. There are separate inspection regimes for these assets and structures.

Methodology for evaluating risk associated with a defect

To determine the appropriate response time for repairing a defect the risk associated with each defect is evaluated. Risk evaluation is based on a) "Impact" or the extent of the damage that might be caused should an incident occur and b) "Probability" or the likelihood of a user encountering a risk. When determining the impact, speed and volume of traffic are important factors. When determining the probability, important factors are the road's place in the network hierarchy, the position of the defect on the highway, the roads geographical location and pedestrian and traffic flow.

The rationale for classifying highway defects in this way is to prioritise how and when remedial work is undertaken. High risk defects require prompt action but the repair of low risk defects can be incorporated into more coordinated long-term work programmes. The benefit of this is that first time permanent repairs are more cost effective and durable than reactive temporary repairs.

3.2 Planning, Co-ordinating and Scheduling Work

Asset Management System - "Confirm"

All reported defects are recorded on the asset management system "Confirm" and assigned a unique reference number. This enables the information pertaining to each highway enquiry or inspection to be tracked.
Call Derbyshire has an interface with Confirm. Operators in the Call Centre can record highway defects, reported by members of the public, on a web form which automatically generates an enquiry in Confirm. The Members Casework System however, which is used to log, track and co-ordinate issues raised by constituents, does not have an automated interface with Confirm. Currently this information is manually transferred between the Casework System and Confirm.

The Control Centre

The Control Centre is responsible for scheduling highway maintenance work and links the client function of the Council with the consultancy and contracting function (AllRoads). Potentially urgent highway defects notified by the public and the highway inspectors are forwarded directly to the Control Centre where Business Support Staff allocate and schedule the necessary reactive maintenance work to an appropriate road gang. Non-urgent repairs are reviewed by the relevant Area Maintenance Manager before the work is routed to the Control Centre.

3.3 Physical Completion of Work

AllRoads is the Council's Direct Labour Organisation and is responsible for carrying out highway maintenance work in Derbyshire. Reactive maintenance work is carried out by small teams or "road gangs" made up of two or three road workers. Each road gang travels to the worksite and transports the materials required for the job in a 3.5 tonne pick-up truck. They are also equipped with a hand-held computer or Toughbook which allows the gang to receive work in the field (via mobile phone signal) and record the status of each job by recording start and finish times. In addition, using the Toughbook they can take a photograph of the defect before and after repair. Prior to being issued with a Toughbook, road workers receive training and undergo a practical assessment to ensure that they are able to operate the device.

4. Performance Measures

Performance Management

The Economy, Transport and Environment Department has a framework in place to monitor and manage performance. This includes the Strategic Director holding quarterly performance clinics where performance indicators for highway maintenance are considered.

Maintenance response times

The Highways Division receives a large volume of notifications regarding road defects. In 2014 (January to December), 23,446 road defects were reported to the Council. More than half of these were identified through routine road inspections (12,659) and the remainder (10,787) were received as notifications from the public.

Once notifications are received they are prioritised, according to the severity of the defect, and assigned a target time for when the maintenance work will be completed. The target time categories are 32 hours, 5 days and 28 days. Not all notified defects are classified in this way, sometimes the work is deferred and the repair of the defect is incorporated into a larger, previously scheduled maintenance scheme. Of the notifications received from the public some are not assigned a target time as the defect may not meet the criteria for repair, insufficient detail may have been provided about the location of the defect or duplicate notifications may have been received for a single defect.

During the 2014, a total of 19,557 jobs were classified and assigned a target time for repair and 16,097 jobs (82%) were recorded as having been completed.

Of the jobs that were marked as “completed”, 3316 were recorded as being completed within the target time. This is an extremely low figure. It represents only 21% of the jobs completed during the twelve month time period.

Whether this is a true reflection of response times and therefore a measure of poor performance or whether this relates to problems with data collection is not clear. Given that the Economy, Transport and Environment Department acknowledge that the mobile technology is not being fully utilised, and that not all of the key information about reactive maintenance is being logged, the evidence points to the latter.

User satisfaction data

The citizens of Derbyshire consistently place a very high priority on the condition of the highway. In the 2014 budget consultation, roads and pavements were identified as the second highest priority, with jobs and economic growth being the highest.

In the 2014 National Highways and Transportation Survey (conducted by Ipsos Mori) road condition was identified as the highways and transportation issue that people felt was of greatest importance and most need of improvement. It was also the issue that people were least satisfied with. The level of satisfaction in Derbyshire compared favourably with many of the highway authorities surveyed, however, over the past 6 years there has been a downward trend in Derbyshire in the public satisfaction with road condition. Derbyshire was ranked fourth out of 24 County Councils in the 2013 annual survey, but in the most recent survey (2014), Derbyshire was ranked seventh.

Conversely, in the same survey, Derbyshire's ranking for highway maintenance rose from ninth in 2013 to fourth in 2014. However, the actual satisfaction scores for this indicator displayed a relatively small change (50.3 compare to 51.1), so the improved ranking may reflect deteriorating public satisfaction with other councils rather than increasing satisfaction with Derbyshire's highway maintenance. Indeed, the survey showed high dissatisfaction levels for speed of repair in Derbyshire 65% and quality of repair 57%.

5. A Strategic View

The Highways Service Improvement Programme

The Economy, Transport and Environment Department has robust plans in place and is making progress towards the delivery of Derbyshire's Highways Service Improvement Programme. This suite of initiatives includes:

- A budget and efficiency drive to meet the £8.85m budget cuts in 2010/11 to 2014/15 and further £1m cuts in 2015/16.
- The injection of £23m (over 3 years) into "Accelerated Highway Maintenance" whereby a proactive asset management approach is being adopted to stem the deterioration of highways.
- Quality Management Systems to ensure that systems and procedures are followed.
- A permit scheme that will give the Council the power to issue or refuse a permit (and apply conditions) to statutory undertakers wishing to undertake work on traffic sensitive roads.
- The introduction of a Single Asset Management System (SAMS) that will replace a number of existing systems and allow activities arising

from different work streams to be coordinated more effectively as a result of enhanced data intelligence and improved information sharing.

- Re-engineering of the Control Centre

Single Asset Management System (SAMS)

The Single Asset Management System (SAMS) will enable information from a range of operations to be easily shared and will implement the new version of the Confirm software. Over the next 12 months it will bring together information captured by five separate asset management systems. The operations that will be supported by SAMS include: Highway maintenance, Highway design, Traffic management, Highway development Control, Street works (permit scheme), Control Centre, Structures, Street lighting, Countryside, Public rights of way, Customer engagement and Finance.

A key driver for the implementation of SAMS and the associated service redesign measures is to increase efficiency by improving working practices and making them consistent across the County. Anticipated benefits include the ability to more effectively manage contracts, automatically code costs to the relevant budget and more reliably estimate the materials and time required to complete work.

The vision for the Control Centre is to have real-time mapping which will allow work to be allocated more effectively and resources to be used more efficiently. Being able to see the location of each road gang and the status of the jobs that have been allocated to them will allow reactive work to be assigned to the road gang that is best placed in terms of their physical geography and the materials they have available to them.

SAMS will facilitate opportunities for improved customer service. As well as enhanced on-line progress tracking of enquiries, in the long-term, members of the public will be able to register to receive notifications about on-going work within a radius of their home or any other geographical area that is of interest to them. Ultimately the vision is to publish live works information on the Council's website which would allow the public to access a comprehensive list of jobs that have recently been completed and view the dates of when work is scheduled to be undertaken in their area.

The upgraded version on the Confirm software will enable extensive use of performance dashboards to highlight priorities and approaching deadlines. There will also be the potential to tailor dashboards to the needs of individual Elected Members so that they can review highway maintenance activities in their electoral division and track highway enquiries raised by their constituents.

Accelerated Maintenance Programme

Successive cuts to capital and, particularly, revenue budgets over the last few years has meant that an increasing share of Derbyshire's highways funding has been spent on reactive maintenance of highway defects, such as potholes. This has reduced the capital available to undertake the type and scale of maintenance required to address the deterioration of the highway network.

To improve the condition of Derbyshire's roads the Accelerated Maintenance Programme will provide an investment of £23m, over 3 years, to fund the surface dressing of significant lengths of highway. Surface dressing restores the roads surface friction and creates a water tight seal thus slowing deterioration of the roads condition caused by water ingress. The resulting improvement in the highways infrastructure will reduce the demand for reactive repairs and prevent substantial parts of the network deteriorating to a level such that more costly repairs are required**.**

The Accelerated Maintenance Programme will draw on good asset management principles designed to get the most out of the County's highway assets. This will be achieved through well-timed interventions that rely on good condition data and lifecycle planning. The sections of the highway network where the work will be undertaken will be selected and determined by adherence to technical assessment criteria based on a range of mechanical and manual survey data.

6. Site Visit to Leicestershire County Council Highway Control Centre

The Chair of the Working Group (Councillor Lauro) visited Leicestershire County Council (LCC) to learn from their experience of establishing and managing Leicestershire's Highway Control Centre. To share the lessons learnt Councillor Lauro was accompanied by two officers from Economy. Transport and Environment Department: Angela Glithero (Assistant Director Resources and Improvement) and Geoff Pickford (Service Director for Highways). The evidence gathered at this site visit is given below;

- Leicestershire has a Direct Labour Organisation "Leicestershire Highways Operations" which delivers most of their highway maintenance and improvement services, topped up by an alliance contract with Lafarge Tarmac.

- In recent years the department has used the Highways Maintenance Efficiency Program (HMEP) LEAN Toolkit to review a number of their systems including, gulley cleansing, programming of planned work and

responsiveness to customer enquiries.

- The core idea of LEAN is to maximize customer value. It aims to eliminate any waste of time, effort or money by identifying each step in a business process and then revising or cutting out steps that do not create value.

- A review by LCC of their responsiveness to customer enquiries had been undertaken because performance data showed that there were significant delays in repairing highway defects.

- Their Control Centre had been up and running for some time but it wasn't clear how in practice it was operating. Therefore the review team sat in the Control Centre and observed what was happening.

- They LCC review found that:

    - The quality of information that the Control Centre received was poor. Approximately 15 % of the work "tickets" did not contain the information required to schedule the work. Often the fact that traffic signals were required was not recorded so the road gangs would turn up at the location and not be able to carry out the job. This meant that the gang would have to go out on another occasion.
    - Teams would be sent out to repair an urgent pothole (category 1) but would leave adjacent category 2 defects untouched and return another time to repair the category 2 defect.
    - Patching work didn't take in to account resurfacing schemes, so a stretch of road might be patched and then the following week would be resurfaced.
    - Road gangs would spend time travelling to collect and then queue for materials.
    - The materials used to temporarily repair a pothole were not durable so gangs would have to revisit the pothole and repeat the repair.

- To overcome the issues identified the following measures were taken:

    - A weekly rota was introduced so that the assistant engineers from the district offices were based in the Highway Control Centre and were given the role of validating works orders. This helped them to understand how the inspectors were working and get a feel for the quality and type of information being provided.
    - A trainee technician was also located in the Control Centre and was mentored by each of the assistant engineers. Through this co-location they were able to develop an understanding of the

processes and how works programs are put together. The face to face interaction also helped to build a positive working relationship.
    - Hot boxes were introduced so that road gangs could carry sufficient material for a day's work on 7.5 tonne vehicles.
    - Greater visibility of the work programme was introduced so that customer service and Control Centre operators were able to see forthcoming work planned for the next 3 months and advise members of the public accordingly.
    - A trial of different materials (Viafix quick and Instamac Orange) for temporary re-instatements was initiated and early results indicate that using a higher quality material to repair category 1 repairs incurs a higher cost initially but is more cost effective in the long term as there are a reduced number of repeat visits to repair the same pothole.

- Since the above measures were introduced there were significant improvements in response times for repairing highway defects.

- The Manager of the Support Systems Team and the Operations Manager of the Highway Control Centre described how they successfully introduced new working practices that led to more efficient operations across the board. They felt that one of the key factors to success was involving the workforce in the change process.
    - From the outset they explained the rationale for change. This included showing the workforce the Highway Control Centre and demonstrating how the data collected in the field would be used to program work more effectively. It was made clear that the number of jobs completed by each road gang would be monitored and that the location of each vehicle could be identified.
    - The trade unions were assured that any performance issues identified through Confirm would be dealt with as and when they arose and not used to build a case against an individual or road gang. The trade unions then supported the introduction of hand-held technology as way of working more efficiently and ultimately saving jobs
    - Road gang members were involved in the selection of the mobile technology that they would use and were asked to trial a number of different devices.
    - Rather than a technical team delivering training to the entire workforce on how to use the hand-held devices. The road gang supervisors were trained first and were then supported to deliver the training to their own teams
    - Members of the Systems Support Team worked with the workforce at the roadside, guiding them through the usage of the

hand-held devices. Some individuals were visited several times until they were confident with the system.
  - Now that the working practices are well established, performance figures relating to each gang continue to be monitored and are circulated so that the gangs themselves can see how they are doing. If a gang is not doing so well they receive extra support and training. Good performance is always acknowledged and poor performance is addressed.
  - The importance of building good working relationships between different groups of staff was also stressed.

7. Review Conclusions

Following research and evidence gathering from key witnesses the review working group reached the following conclusions:

- The protocol for determining when and where highway maintenance is undertaken is clearly defined within the Department. The methodology for evaluating risk associated with road defects is well documented and allows work to be prioritised in a consistent way. It is also effective strategically as it facilitates more first time permanent repairs, which are more cost effective and durable, than reactive temporary repairs.

- The objective of the Accelerated Maintenance Programme is to stem the deterioration of highways and to restore the majority of the network to a condition that can in the future be maintained through a more cost effective maintenance strategy. To an onlooker with no prior knowledge of the decision-making rationale, it may not be clear why a road in a comparatively good state of repair is being resurfaced and they may feel that another road is in greater need of repair. Therefore in order to better manage expectations, the review recommends that publicity material is created and disseminated so that the general public and Elected Members are better informed about the factors that influence decisions about highway maintenance.

- The review identified that there is a need to capture more accurate information about the nature and location of road defects reported by members of the public. Frequently, the enquiries received by the Highways Division are not well described. The location is often unclear and this can make it difficult to locate the defect that has been reported, or can result in duplicate reports being recorded on the Confirm system. The Working Group was informed that work is already underway to improve the information provided to the public about how to report a highway defect. Having seen that other local authority areas, for example Northamptonshire, provide on-line maps for members of the public to mark defect locations, the working group was pleased to learn

that a similar approach is planned for the “Do It Now” section of the Derbyshire County Council website. It has also been noted by the review team that a project is on-going with Call Derbyshire to update scripts, undertake more training for call handlers, and to consider having a smaller number of call handlers with a greater level of training and expertise for highways issues. Therefore to support these initiatives to improve the accuracy of the information about defects reported to the Council, it is recommended that clear reporting guidance is developed for the public and publicised.

- Currently business services staff in the Control Centre allocate and schedule maintenance work to the appropriate road gangs. A contracts manager is also located in the Control Centre and is available to provide technical expertise. With the implementation of the Permit Scheme the task of scheduling work will become increasingly more complex. To perform this task effectively, those making these decisions will need to have (or have easy access to) technical expertise about the implications and requirements of the maintenance activities being undertaken. For example, to schedule the work they will need to know the plant, materials, and traffic management measures required. Therefore the review recommends that the processes and levels of resource in the Control Centre be reviewed as part of the current Control Centre project, particularly in relation to technical expertise.

- The Department has a clear vision for the Single Asset Management System (SAMS) and it is evident that the development of the system is robust and well managed. However, the success of the new system rests with timely and accurate data being captured, and routine performance management.

- The volume and quality of information recorded on the Toughbooks available to each road gang needs to be considerably improved. Often the start time or finish time is not recorded, nor is the material that has been used or the description of the work that has been carried out. This review recommends that an action plan is developed to ensure that road gangs record, accurately and in real-time, the required information about each job using the mobile technology provided, and that progress against the action plan is reported to the I&S Places Committee.

- The vision for the Control Centre is to have real-time mapping which will allow work to be allocated more effectively and resources to be used more efficiently If the vision for the Control Centre is to be realised, it is crucial that the relevant information in the field is captured in an accurate and timely manner.

- Any new programme that aims to change some comfortable and well established processes requires thorough and effective internal communication. The Working Group feels that more should be done to explain the rationale behind the SAMS project and, furthermore, Members believe that lessons could be learned from the approach described by Leicestershire County Council. For example, staff who are required to record information on hand-held devices would benefit from seeing how the Control Centre uses the data they provide. Such an approach would demonstrate the importance of recording the status of each job in real-time and would illustrate how work can be co-ordinated and allocated more efficiently. This review recommends that the SAMS implementation plan includes measures to communicate the rationale for the project to all members of staff in order to achieve “buy-in” and a more collaborative working environment.

- This review has identified that only 21% of reactive maintenance jobs that are completed, are recorded as being completed within the target time. Therefore it is recommended that the Strategic Director updates the Committee (at mutually agreed times) on the progress made in meeting target times for the completion of reactive maintenance work.

8. Recommendations

The review working group Members make the following recommendations.

It is recommended that:

1. The factors used to prioritise highway maintenance are clearly communicated to the general public and local Members.

2. In order to capture more accurate information about the nature and location of road defects, clear reporting guidance is made available to the public which includes information about what constitutes a defect requiring action.

3. The processes and levels of resource in the Control Centre are reviewed as part of the current Control Centre project, particularly in relation to technical expertise to ensure that scheduling of reactive maintenance work is more effective and efficient.

4. The SAMS implementation plan includes measures to communicate the rationale for the project to all members of staff in order to achieve “buy-in” and the adoption of consistent and more efficient working practices across the County.

5. Robust measures are developed to ensure that road gangs record, accurately and in real-time, the required information about each job using the mobile technology provided, and managers reinforce this requirement.

6. The Strategic Director updates the Committee (at mutually agreed times) on progress made against target times for the completion of reactive maintenance work.

APPENDIX 1

Meeting Schedule

Meeting date	Topic	Evidence gathering activity
12 August	Overview of current Highway Inspections Process	Meeting with: • Glyn Dutton (Principal Engineer-Maintenance) • Geoff Pickford (Service Director for Highways) • Paul Millership (Technical Policy and Highway information)
28 August	Managing reported highway defects. • How defects are reported • The "Confirm" software system. • Keeping the public informed • Future developments -the Single Asset Management system (SAMS)	Presentation: • Graham Harris (Highways Systems Manager)
2 October	Control Centre and AllRoads: Allocating work and monitoring performance	Meeting with: • Cllr Dean Collins • Geoff Pickford (Service Director for Highways) • Steve Mead (Transport Asset - Flood Risk Manager)
16 & 17 October	Highway safety inspections and repairing highway defects. Opportunity to meet inspectors and road gangs.	Site visit: • Stonegravels and Willington Highway depots
12 November	Strategic issues and performance	Meeting with: • Cllr Collins (Cabinet Member Highways Transport and Infrastructure) • Geoff Pickford (Service Director for Highways)
27 November	Highway Maintenance - "Lessons" from another authority	Site Visit: Leicestershire County Council Highway Control Centre • Mark Stevens (Assistant Director Highways LCC) • Ruth Hughes (Team Manager Support Systems LCC) • Chris Green (Senior Operations Manager LCC)
8 January	The Highways Service Improvement Programme	Meeting with: • Angela Glithero (Assistant Director Resources and Improvement) • Geoff Pickford (Service Director for Highways)
19 January	Challenges, opportunities and suggestions for improvement	Working group discussion to agree recommendations