

APPENDIX B1 – CASE STUDIES

LIST OF FULL CASE STUDIES

- Customer Engagement – Bath & North East Somerset Council
- Inspector Gangs – Bath & North East Somerset Council
- Demonstrating the Need for Funding – Blackpool Council
- Developing a Business Case for Prudential Borrowing – Hampshire County Council
- Prevention Prevents Potholes – Lancashire County Council
- Preventative Maintenance – Leeds City Council
- London Highways Alliance Contract – London Boroughs and Transport for London
- Response Times – Northamptonshire County Council
- Long Term Investment in Highway Maintenance – Portsmouth City Council
- Analysis of Data – Somerset County Council
- Use of Technology – Somerset Highways
- Patching Performance (Project Patch) – Staffordshire County Council
- Right First Time – Transport for London
- New Surfacing Materials Specification – Transport Scotland
- Improved Quality Pothole Repairs – Walsall Council
- Lean Methodology – Worcestershire County Council

Customer Engagement – Bath & North East Somerset Council

Summary

Bath & North East Somerset Council has made a concerted effort to ensure that highway defects reported by members of the public are not only attended to, but also that feedback to the customer is achieved. Utilisation of technology, including real-time updating of the asset management system, through 3G connection, ensures that a current, full audit trail exists for every report. A response, if required, in the format requested by the person making the initial enquiry, is sent informing them of the completion of repairs, or planned repair, to the reported defect. Benefits include a reduced number of repeat enquiries, notable increases in phone calls and letters of appreciation and improved customer and member satisfaction.

Background

It was recognised that although requests and enquiries for service were acted upon and repairs carried out, not all of those enquiries were followed up with a response, either by mail, email or telephone. Consequently the person making the enquiry was not always informed that the request had been carried out.

Drivers for Change

Bath & North East Somerset is keen to explore all possible improvements and efficiencies to the services it provides, ensuring value for money and a customer focused service. Customer feedback had highlighted an issue with adequacy of responses to requests for service. Consequently the Council made a concerted effort to improve their approach and ensure that all enquiries were responded to, where a feedback requirement had been made by the member of the public.

Good Practice

As a result, a review of the performance data from Customer Feedback revealed a response rate of just 37 per cent at the end of the 2009-10 financial year.

The customer relationship management system provided details of all enquiries where a response was required. The use of existing technology was maximised to ensure that all mail, e-mail and telephone feedback was carried out, achieving a 100 per cent response rate by July 2010. The monthly rate has been maintained above 90 per cent to date.

Benefits

In addition to regularly achieving a monthly response rate of 100 per cent, improved satisfaction among residents, businesses and Elected Members is also evident as a result of the approach.

Bath & North East Somerset Council has seen the following benefits:

- **Improved customer satisfaction.** Improved customer satisfaction survey results as well as reduced numbers of enquiries. Recorded as the most improved Unitary Authority, for road maintenance indicators, in the 2011 NHT customer satisfaction survey.
- **Improved Member engagement.** Increased satisfaction and trust in the approach taken facilitates improved engagement with elected Members.

Barriers

Initially, given limited resources, time required to respond to all enquiries was difficult to find. Through changes to processes and procedures, a 100 per cent success rate was achieved in a short space of time. Difficulty in achieving 100 per cent feedback during extreme weather periods, eg prolonged snow and ice, when enquiries peak.

Contact Details

Craig Jackson, Team Leader – Highway Maintenance and Public Rights of Way

Tel: 01225 394269

Email: craig_jackson@bathnes.gov.uk

George Bottin, Senior Highways Engineer – Highway Maintenance and Public Rights of Way

Tel: 01225 395129

Email: george_bottin@bathnes.gov.uk

Inspector Gangs – Bath & North East Somerset Council

Summary

Bath and North East Somerset has developed 'Inspector Gangs'. Gangs belonging to their term contractor are assigned to an area's inspector and collaborate with them to ensure all highway defects, including potholes, are managed effectively and efficiently. During their daily repair duties, Inspector Gangs are empowered to identify safety defects and, through liaison with the inspector, can affect repairs to previously unidentified defects immediately.

Benefits have included improvement in customer satisfaction and a reduction in enquiries. Bath and North East Somerset was the most improved unitary authority for customer satisfaction in road condition in the 2011 National Highways and Transport Survey and saw a 62 per cent reduction in public liability claims.

Background

Bath and North East Somerset carried out a lean review. The review was carried out to determine a more efficient approach to managing potholes. This involved reviewing the identification and assessment of defects by highway inspectors, issuing the required repairs to the contractor for repair, and resourcing the programme and works. During this review it was evident that some 'waste' was present in the processes involved in the management of pothole operations. It was noted however that no technical difficulties were experienced with the current approach.

Drivers for Change

Bath & North East Somerset is keen to explore all possible improvements and efficiencies to the services it provides, ensuring value for money and meets customer expectations. A Lean review was carried out to identify what efficiencies could be made in the management of potholes including repairs.

Good Practice

As a result of the Lean review, the decision was made to pilot an 'Inspector Gang' system, whereby a maintenance gang is assigned to a highway inspector, responsible for the inspection and maintenance of a geographical area.

The Inspector/Gang relationship introduced a collaborative approach to the response to the repair of potholes and other defects. Although still led by the highway inspector, gangs carrying out the works are also empowered to identify report and ultimately repair defects whilst carrying out their duties. Both parties worked together to ensure a co-ordinated response to defect repair and ensure all necessary asset information is captured.

Local knowledge aids response planning and material choices, with temporary repairs being carried out where immediate response is required or where traffic management issues make it difficult to perform a permanent repair first time.

The pilot proved successful, with the remaining five areas of the council implementing the same arrangement. Additional gangs can be assigned to individual areas to address any peaks in workload, for example, following a cold spell.

Benefits

The arrangement works well, with the added benefit that ever increasing local knowledge of both the highway inspector and the gang ensures a co-ordinated response to the repair of potholes and other safety defects. Improved satisfaction among residents, businesses and Elected Members has also been evident as a result of this approach. A 'pride of patch' mentality has also been established through assigning gangs to a specific area on the network.

The benefits from adopting the Inspector Gang approach is summarised below:

- **Reduced claims:** claim numbers reduced from 273 to 103 for the 12 month period Nov 2010 to October 2011 the previous 12 month.
- **Improved Response times:** Improvements to the pothole and safety defect inspection and repair process, providing improved response times and greater productivity of repair gangs.
- **Improvements to highway intelligence:** Recording of all activities on mobile devices, in the field, provides substantial quality data for asset analysis and decision support.
- **Improved customer satisfaction:** Improved customer satisfaction survey results as well as reduced numbers of requests for service.
- **Improved Member engagement:** Increased satisfaction and trust in the approach taken facilitates improved engagement with Elected Members.

Barriers

Loss of staff has had a temporary influence on the management of defect repairs, although recruitment of suitably skilled personnel addresses this issue. Inspector/Gang relationships need to be re-established to ensure the co-ordinated response continues.

Contact Details

Craig Jackson, Team Leader – Highway Maintenance and Public Rights of Way

Tel: 01225 394269

Email: craig_jackson@bathnes.gov.uk

George Bottin, Senior Highways Engineer – Highway Maintenance and Public Rights of Way

Tel: 01225 395129

Email: george_bottin@bathnes.gov.uk

Demonstrating the Need for Funding – Blackpool Council

Summary

Blackpool has a network of 500 km. Its total maintenance funding (capital and revenue) before 2010 was approximately £1.2 million, which was insufficient to arrest deterioration of the network. Much of this funding was therefore spent on routine maintenance, including the patching of potholes. Consequently insufficient investment could be obtained for preventative maintenance treatments. Blackpool presented a robust argument for greater funding to develop a preventative approach to maintenance. Their business case was based on asset management principles supported by specifically developed asset management tools. This approach was successful in obtaining an additional £30 million of funding through Prudential Borrowing. This additional funding enabled Blackpool to develop levels of service which met the needs of their stakeholders, including Elected Members and the public, using preventative maintenance approach. Blackpool will now use the asset management tools developed to share as best practice with other local highway authorities aiming to achieve similar outcomes.

Background

Blackpool has been a Unitary Authority since 1998. During this time, one of its key highway maintenance challenges has been to reduce the number of potholes and arrest deterioration on its network, within constrained funding arrangements. The established approach to measurement of network condition and developing of maintenance programmes resulted in schemes that were hard for to justify for funding to elected members, as value for money could not be demonstrated.

Consequently insufficient funding could be obtained to adopt an approach that would develop a capital works programme for preventative maintenance. The objective of this programme would be to reduce future routine maintenance such as expenditure on pothole repairs.

In order to develop an approach that could justify investment in a preventative approach to highway maintenance and demonstrate value for money the council invested in Geographical Information Systems (GIS) and developed bespoke applications. This approach to develop the next generation of asset management systems and act as a regional champion for was supported by DfT through their DfT Element 2 funding.

Drivers for Change

The established approach for identifying programmes was insufficient to demonstrate the requirement to arrest deterioration of the network. Consequently the majority of funding went on reactive maintenance, through the patching of potholes. This approach did not improve the condition of the network. In order to improve the condition of the network to meet the standards required by the stakeholders a more effective approach was required. This approach needed to demonstrate the benefits of investing in highway maintenance to relevant stakeholders.

This approach needed to be supported by robust data on asset inventory and condition. Existing information was inconsistent to support the change in approach. The systems, the council did have in place, were not able to provide the case for additional funding. The approach that the council developed is described as follows:

Good Practice

Blackpool Council developed a recovery plan setting out how they would move from a position where they were patching potholes on a reactive basis to one where they adopted a preventative approach to maintenance.

In 2007 Blackpool developed their recovery plan. One of the outputs from this was their Highway Asset Management Plan (HAMP). In their HAMP the council set out the condition of the network, the predicted deterioration in the network over the next five years and what additional funding was required to bring the network to the required standard. Through the use of GIS this maintenance need was demonstrated geographically by ward. As a result each member could visualise the condition of their ward. This also demonstrated the effect of disruption through reactive works, the loss of trade that would occur if the network was not maintained in a more controlled manner through the use of preventative maintenance.

In order to support this, the highways team, developed their own approach to treatments surveys which were visually supported using their Geographical Resource Platform.

Treatment Surveys

Blackpool Council needed to better understand the condition of their carriageways and footways in order to develop effective programmes of work to arrest the deterioration of their network. This would enable better decision making. Consequently the council developed their own survey methods known as Carriageway Treatment Surveys (CTS) and Footway Treatment Surveys (FTS) respectively. These surveys were based on the UKPMS DVI survey but included an element that allowed the inspector to identify the treatment defect as they were surveying the network. Both these surveys covered 100 per cent of the network annually, compared to 25 per cent for a standard CVI survey.

Inspectors carrying out the surveys used a specifically developed inspection manuals that identified suitable treatments against defects. These treatments had been developed in consultation with their surfacing contractor. It was on the basis of this approach that they made their maintenance treatment decisions for preventative maintenance.

The CTS and FTS were plotted on the Geographical Resource Platform. This provides a visual picture of the condition of the network, including predicted deterioration and cost of rectifying the network to the required performance standard. Each ward was displayed separately. This enabled direct Elected Member engagement that was relevant to each member's area. It can also provide robust and accurate information on material quantities.

This new approach to maintenance called 'Project 30' and would:

- Improve the streets for the benefit of residents
- Arrest the accelerating decline of the network
- Significantly reduce the amount of patching and potholes
- Significantly reduce the number and cost of tripping claims

The development of the recovery programme and the approach to defining network condition provided the data required to support a business case for the capital investment required. This was provided through Prudential Borrowing. In order to obtain additional capital investment Blackpool prepared a successful business case to obtain Prudential Borrowing. Key aspects of the business case that Blackpool was able to substantiate through their approach included:

- Demonstration that the current rate of network deterioration and investment it would take 25 years to recover the network to an acceptable standard of condition.
- An upfront capital investment of £10 million of the next five years would bring the network to the required standard and subsequently reduce the amount of revenue required for routine maintenance of the network creating a long term saving of £100 million.

Benefits

Blackpool Council has seen the following benefits from adopting the fully automated approach:

- Efficiencies in inspection and treatment selection.
- Member buy-in
- Reducing occurrence of potholes
- Reducing claims
- Securing long term capital programme
- Improvement in public perception of the network through the NHT Survey

Barriers

The approach adopted by Blackpool Council promotes a preventative approach to maintenance. However there is no system or process in place to select and analyse treatments on a lowest whole life cost basis. It is envisaged that the HMEP Product on Lifecycle Planning will support this requirement.

Contact Details

Will Britain, Asset Manager

Email: will.britain@blackpool.gov.uk

Developing a Business Case for Prudential Borrowing – Hampshire County Council

Summary

Hampshire has used a lifecycle planning approach to determine the level of capital funding in highway maintenance required to bring its highway network to the desired level of service that is essential for the prosperity of Hampshire and its residents. Asset management information was used to build a case for Prudential Borrowing. Through this approach, a commitment to provide additional capital funding of £10 million per year for seven years, to allow the authority to improve condition and improve resilience in the network, was agreed in 2010. The increasing number of potholes on the network following the severe winter weather events was one of the drivers that encouraged Hampshire to adopt this approach.

Background

Following the severe winter weather in 2008-09, Hampshire recorded a significant number of potholes on their highway network. The council was awarded £2.6 million of emergency capital funding from the Department for Transport (DfT) to address the pothole problem. The issue of potholes was considered by elected members who wanted to know the cost of restoring the highway network to the condition it was prior to the severe weather. Council officers used asset management information to calculate that approximately £12.5 million was needed for this purpose. On the back of this information the necessary additional funds were made available. It was also demonstrated to the elected members that this funding would allow maintenance activities to be carried out to bring the network back in line with the pre-winter condition, but would not result in any overall improvement in condition.

Drivers for Change

Over a number of years, Hampshire used revenue maintenance funds to repair potholes in a reactive way. It was recognised that this approach did not offer value for money as the condition of the highway network was not improved. Change in the way highway maintenance was managed was driven by:

- Road condition becoming a 'hot topic', due to bad winters, hot and dry summers and flooding, all of which had a significant impact on road condition;
- Increased recognition that asset management provides value for money and is the sensible way to improve highway condition in the long term; and
- Changes in financial management and reporting, leading to the need for linking highway condition to funding.

Good Practice

Asset management awareness has increased in the council, leading to recognition that preventative treatments often offer better long term improvements. The council had set targets for improving performance on based on National Indicators and recognised that asset management techniques would support delivering the required

improvements. The DfT emergency capital funding provided the opportunity for senior stakeholders to focus on this issue. The council had already worked on the development of decision support tools to help with the implementation of a lifecycle management regime. Following the severe winter weather, these tools were used to make the case for estimating the levels of funding that were required for restoring the network to its pre-winter condition, as well as for improving the overall condition.

The elected members asked the officers to calculate the level of funding that was required to bring the entire highway network up to a desired condition. The first task was to determine the level of service that was required for each part of the network, taking into account how risks could be effectively managed.

Lifecycle plans were developed for all asset types, determining the level of funding that was required to deliver the required levels of service. This work was used to build an argument that approximately £100 million was required to deliver the required improvements and provide a highway network with improved resilience to adverse weather conditions whilst delivering the service that is required. The council decided to investigate a level of Prudential Borrowing to cover the need for investment. The funding is planned to be made available over a period of seven years. Asset management tools are being used to support decisions on where and how this funding should be spent to provide optimum results.

The work carried out to restore the highway network to its pre-winter condition was known as 'Project Restore'. The work carried out under further increased funding to improve the condition of the highway network is known as 'Project Resilience'.

The work described above has led to the development of a strong highway asset management team in the authority that has responsibility for reviewing maintenance needs and considering the optimum use of funding whilst taking into consideration lifecycle management considerations.

Benefits

It is expected that this additional funding will improve the condition of Hampshire's highway network, providing the required resilience. This year is the first year of the planned 10 years 'Project Resilience' and therefore, it is not possible to demonstrate condition improvements yet. However, there are three benefits that can already be recorded:

- The strong emphasis on asset management that has allowed for a good case to be built for additional funding or investment.
- An improvement of one per cent in the Public perception of highway condition has been identified in the recently released results of this year's NHT survey.
- Reduction of third party claims against the council.

Barriers

During the process described above, it has been necessary to manage expectations of both elected members and the public. It is important to note that asset

management information can be used to build a robust argument that explains what can be achieved.

The council had to work with their contractors and supply chain to ensure that the works resulting from the additional funding could be delivered.

Contact Details

Steve Spender, Highway Manager HQ

Email: Steve.Spender@hants.gov.uk

Clive Griffiths, Asset Manager

Email: clive.griffiths@hants.gov.uk

Prevention Prevents Potholes – Lancashire County Council

Summary

Lancashire has utilised preventative maintenance for many years, particularly through surface dressing. The use of surface dressing to act as a waterproofing agent against the ingress of water together with a pre-patching programme that has not only added life to roads but has prevented pothole formation. Surface dressing roads has filled the cracks and fissures with binder, sealing the surface against water penetration, hence 'water has nowhere to hide'.

Roads in Lancashire that have been surface dressed over the last five to seven years have been virtually pothole free in the last few years, the only exceptions being where highway openings and subsequent reinstatements have broken the waterproofing. If budget permitted many more roads would be surface dressed as performance and evidence in Lancashire certainly shows that 'prevention is better than cure'.

Background

Recent winters, particularly in 2010-11, were probably the worst on record for the affect of water and freeze/thaw attack on carriageways. It seemed that wherever one travelled there was not a length of carriageway without signs of distress caused by the winter. This was not the case on many roads in Lancashire and it is important to recognise that this was through the consistent use of a planned surface dressing programme.

Approach

Undertaking preventative maintenance through a regular planned programme of surface dressing has been Lancashire County Council's practice for many years.

It is understood that surface dressing acts as a waterproofing agent against the ingress of water into the carriageway as well as restoring skid resistance. Good patching for structural maintenance together with a well-designed dressing will add five to 10 years performance to the life of the carriageway.

Fractures and fissures in the carriageway surface should be identified early before the freeze/thaw scenario takes hold, leading to the breakdown of the bitumen bond. Once pockets have formed in the carriageway surface, the constant traffic causes a pressure wave into the material by the pressing of water causing continual disintegration.

In order to prevent such failure occurring Lancashire undertakes an annual surface dressing programme of their carriageways. As a result any cracks and fissures are filled with bitumen emulsion hence there is no water penetration of the surface and no water held in cracks. There is, therefore, no pressure wave caused by vehicular traffic and no freeze/thaw action.

Having undertaken and recorded programmes of surface dressing over a period of years performance can be monitored through local inspection and condition assessment.

Benefits

In Lancashire it is evident that surface dressing has proved to be a very effective and cost efficient way of preventing the freeze/thaw situation on carriageways by sealing the road surface and preventing water penetration. This is proven when travelling on roads in Lancashire as those roads that have been surface dressed within the last five years, and in some cases seven years, are virtually pothole free. There are, however, some exceptions where utility services have undertaken work and caused a weak spot by breaking the waterproofing.

Lessons Learnt

Those roads that have not been regularly surface dressed do exhibit signs of distress and succumb to potholing. Lancashire County Council believes that good highway asset management should include undertaking regular programmes of surface dressing including the Unclassified and 'C' class network especially in rural areas. There is no doubt that where a preventative programme of surface dressing has been undertaken the incidence of potholes has been radically reduced and Lancashire will continue to operate according to asset principles that 'Prevention is better than cure' in that 'Prevention Prevents Potholes'.

Contact Details

Dave Rigby, Principal Contracts Manager

Tel: 01772 538509

Email: dave.rigby@lancashire.gov.uk

Preventative Maintenance – Leeds City Council

Summary

Leeds City Council has obtained additional funding from 2004 to 2014 including £76.5 million from their own capital plus an additional £15 million Prudential Borrowing, which has enabled the benefits of a long-term approach for investment in highways maintenance to be adopted. This investment decision was made by Leeds based on the benefits of reducing the maintenance backlog, which was identified through projected highway condition data based on the then existing funding. With this investment a fully informed asset management approach has been adopted, with a concentrated spend on preventative type treatments. Along with improvements to highway inspections and the claims handling process, benefits include improving highway condition, reducing numbers of potholes and improving public satisfaction.

Background

Low levels of investment in the highway maintenance led to concerns by Leeds in the deterioration of their network, the increasing trend in the number of accident claims against the council, high levels of defect reports and a low satisfaction in the service from the public. Condition trends were established using condition data collected through UKPMS surveys and a bespoke Leeds condition survey. This allowed for an estimated cost of all necessary repair work, producing evidence of an ever increasing maintenance backlog.

A business case was made for additional investment to improve highway condition based on the above reasoning. This comprised:

- £15 million Prudential Borrowing, with the resultant expected reduction in accident claim costs funding the repayments.
- £76.5 million additional capital funding from Leeds own capital

This total additional funding was made available between 2004 and 2014 and enabled the council to develop and maintain a long-term maintenance strategy. To ensure the additional funds made a long-term difference, the decision was made not to increase short term reactive maintenance, concentrating on tackling the existing backlog and substantial investment into preventative maintenance. In addition, improvements to the highway inspection process, improvements to highway intelligence and improvements to the accident claim handling process helped reduce claim costs substantially.

Drivers for Change

Elected members' concerns over the increasing accident claims, declining highway condition and low customer satisfaction, and ultimately the winter damage led to engagement with members to develop a case to secure the additional investment based on asset management.

The significant spending on preventative treatments and the resulting improvements in highway condition and customer satisfaction, along with the substantial reduction

in accident claims has led to the desire to consolidate and build on the asset management approach.

Good Practice

Leeds adopted a planned approach to maintenance based on asset management, this set out how they would invest in their highway network over a longer period of time. A deliberate strategy not to increase short term reactive maintenance had been implemented. In addition structural maintenance was no longer directed to roads and footways in the worst condition, consequently many roads and footways were targeted for preventative works. These works were more cost effective enabling greater lengths of road and footway to be treated. This approach would extend the life of the pavement.

To manage the development of asset management across the whole range of highway assets, the existing Asset Management Project Board has been refreshed. The Board, chaired by the Chief Officer of Highways and Transportation, has new terms of reference; this includes responsibility for oversight of the Asset Management Plan and valuation.

A project route map has been devised to include all relevant highway asset groups and to illustrate the information required to develop maintenance work packages, asset valuation, and the asset management plan. A Project Team has been established from across the highways service to deliver all relevant stages and detailed requirements of the route map.

Element 2 funding was combined with Element 1 funding both provided by DfT into a single fund to support extension to all assets and continued development of carriageway and footway asset management. The funds have been spent on equipment, data collection, management and staff.

There is extensive asset management information and proven processes for carriageways and footways, so the work has been focused on improvement and increasing efficiency. The systems for collecting condition information were paper based and the project has introduced hand-held data collection devices. Improvements to the management of gullies, traffic signals, structures & horticulture are also included in the asset management development plan.

Benefits

Leeds has demonstrated the following benefits from adopting the asset management approach:

- **Improved management of claims:** Resulting in greater repudiation and better standing in Court.
- **Improvements to the highway inspection process:** Refresher training and a review of the identification & assessment of potholes ensures robust records and audit trail.
- **Reduced claim costs:** Reduced from in excess of £2.5 million per year to a current £1.3 million per year. Trend continues to fall but at a lesser rate.

- **Improved highway condition:** Informed investment of funding has enabled both the reduction in maintenance backlog and preventative treatments to 'amber' locations.
- **Improvements to highway intelligence:** A planned approach to improving collection and recording of all highway data, utilising technology, provides substantial quality data for analysis and decision support.
- **Improved customer satisfaction:** Improved customer satisfaction survey results as well as reduced numbers of enquiries.
- **Improved engagement with elected members.** Increased satisfaction and trust in the approach taken facilitates improved engagement with elected members to make a full resource case and allocation judgements.

Barriers

Rebalancing the carriageway and footway maintenance programme towards preventative and structural maintenance rather than reactive maintenance reduced local staff discretion and ability to respond to local pressures. This was initially difficult but was accepted as part of solving the greater problem of declining condition and public satisfaction.

Network intelligence is not complete, with additional network being 'adopted' from estates footways. The improvement to processes has facilitated the collection of inventory and condition data. Work continues to address the gaps.

Inspector knowledge and practices were inconsistent, addressed with process improvements and additional training and development.

Additional funding and approach has provided a challenge in resourcing the additional works created. All work has, however, been managed and delivered to date.

Business case benefits and securing of funding were reduced by the large increase in bitumen prices of 2005-06.

Contact Details

Andrew Molyneux, Highways Asset Manager

Email: andrew.molyneux@leeds.gov.uk

Russell Martin, Highway Maintenance Manager

Email: russell.martin@leeds.gov.uk

London Highways Alliance Contract – London Boroughs and Transport for London

Summary

The London Highways Alliance Contract was developed under the Transforming London's Highways Management (TLHM) Programme, a joint initiative between all the London Boroughs and Transport for London (TfL). TLHM has developed a common specification for highway maintenance that is being used as the basis for the four new area contracts that are to be let. The benefits of this collaboration are a reduced menu of materials and treatments together with economies of scale through larger contracts with greater scope and volume of work, whilst also reducing road user disruption through the co-ordination of works across multiple authorities.

The contract is structured in such a way as to allow authorities total flexibility over which services they choose to purchase and the levels at which they require them. Preventative and structural maintenance will be undertaken using this contract which will also cover routine and reactive works such as pothole repairs as well as capital projects. The specification requires the use of hot mix asphalt for permanent repairs although cold proprietary materials can be used in temporary repairs.

Background

Across the capital London Boroughs and TfL collectively spend over £450 million per annum on highways related activities, locally procured through over 100 contracts. A smaller number of London based Common Specification Contracts will deliver significant savings against the current fragmented approach.

Drivers for Change

Analysis by LoTAG in spring 2010 indicated that London tax payers could achieve savings of up to 10 per cent against current contracted highway maintenance spend upon the implementation of a Common Specification Contract under a London wide framework umbrella.

With fewer contracts, London can reduce costs by:

- Gaining the maximum economies of scale.
- Enhancing the relationship between the supply chain and Boroughs, by reducing the financial and labour burden of administering a large number of differing contracts. Under these proposals authorities will gain the best of both worlds; localism to make decisions influenced by local residents and a Contract Board to manage the strategic contractual relationship on a cross Borough basis, resulting in lower contract overhead and staffing requirements.
- Reducing the unnecessarily iterative, and therefore wasteful, process of contract preparation and tendering costs. This alone is estimated to cost £15 million per six-year period, London wide.

Good Practice

The Common Specification Contracts Framework proposes moving away from the current price model contracts to ones based on cost. This is significant: the benefit of knowing the cost of all elements of the contract deliverables will allow greatest control over expenditure. For the first time boroughs will be able to target their limited financial resources, in full knowledge of the real cost, which when married up with respective local knowledge will allow them to maximise the benefits for every pound they spend in the future.

The approach recognises the importance of flexibility in making local decisions based on specific local knowledge and experience. This will be achieved through membership of a single Contract Board. This will undertake the administrative intensive contract resolution activities for all London, thus removing individual borough tender costs. Through collective action to remove differing authorities' requirements, the quality and quantity of work and the ability to provide robust forward programmes will be enhanced, allowing suppliers to:

- Reduce the need to hold contract specific materials and improve their plant and labour utilisation rates by smoothing workloads across authorities.
- Increase their purchasing power with larger contracts that will enable contractors and clients to choose the most financially advantageous supplier for the procurement of highway related materials.
- Optimise both the number and location of depots, delivering savings and freeing up land use.

Further to the financial advantages, the adoption of common contracts will deliver a single local experience to users of highway services. The current multiple contract model gives rise to a confused understanding of how services are delivered, what standards can be expected and precisely which contractor is delivering in any given geography. This can be illustrated by the following examples:

- Maintenance works can be undertaken on local roads in the same activity as those on strategic and principal roads. This would reduce the need for gangs to complete highly localised activity before moving off to treat a second and, perhaps remote area of network.
- Members of the public can not always understand the delineation between Clients responsibility. Having a smaller number of area based contracts will enable a seamless service that is not restricted by artificial boundaries.
- Boroughs will be better able to respond to severe weather incidents by being able to co-ordinate a much larger pool of available resources and target them where they are most urgently required on a cross London basis.
- The high capital investment required by modern highway maintenance techniques will be spread over a number of authorities, resulting in lower individual costs and freeing up working capital for investment in other services.

Planning and co-ordination of major cultural and sporting events can be over complex in London due to the large number of 'contractual' interfaces. Reducing the number of suppliers will allow London to meet the challenges posed by these types

of events, with the reduced supply chain being able to appoint a single point of contract; we can all deal with on a mutual beneficial basis.

Benefits

Engagement in this programme will not only deliver significant financial benefits but gives rise to the potential for unlocking a raft of wider benefits for London, which may be summarised as follows:

- Smoother traffic flows through better joint forward planning and improved collaboration on works.
- Better and more consistent customer experience through a reduction in interfaces and the use of common specifications.
- A developed and consistent approach to efficiency and performance management, to allow accurate comparisons of the supply chain performance across London to be made.
- Improved strategic risk management of road through greater sharing of resources and reduced chains of command.

Lessons Learnt

Various lessons were learnt and seen as key to future success. These included the need to ensure high level political buy-in, which is essential, together with the support of Chief Executives. Development by a joint Client team is a must and engagement with the supply chain via the HTMA has been of real benefit. As with all projects that involve change and innovation, a key to success is to ensure that you communicate to all parties as necessary, remembering that you cannot communicate enough.

Contact Details

Steven Dennis, Senior Commercial Manager, Roads

Tel: 020 3054 1370

Email: steven.dennis@tfl.gov.uk

Response Times – Northamptonshire County Council

Summary

Northamptonshire County Council (NCC) introduced its Highway Maintenance Initiative in April 2010 to increase the amount of preventative maintenance. It also increased the response period for safety defects from 24 hours to five days, with most defects repaired on a semi-permanent basis. The period for other defects was initially increased to six months, but has now been reduced to between two and four months.

Efficiency savings of £457k have resulted from minimising temporary repairs and from effective patching. Longer term savings of £3.5 million are anticipated from the preventative approach. In the first year public satisfaction increased, claims reduced by 48 per cent, and customer reports of potholes fell by 23 per cent. The rate of network deterioration is beginning to slow, and environmental benefits have resulted from a reduction in vehicle mileage.

Background

In late 2009 the condition of NCC's road network was deteriorating. An increasing proportion of maintenance was on roads in poor condition with a consequent reduction in funds for preventative maintenance. NCC was unable to keep up with the rate of deterioration. Severe weather and large numbers of potholes requiring attention within 24 hours were resulting in a high level of temporary repairs, many of which failed quickly due to the continuing severe weather and to traffic volumes, and poor safety practices forced by short timescales and volume of defects.

Drivers for Change

Large numbers of failed repairs were resulting in a public view that NCC repaired a road and then had to repair it again a few days later. Even if repairs lasted, the surrounding road often failed and required further repair, all of which was poor use of resources. This, coupled with the recognition that NCC was unable to keep up with the overall rate of deterioration, provided the incentive to change the approach to maintenance.

Approach

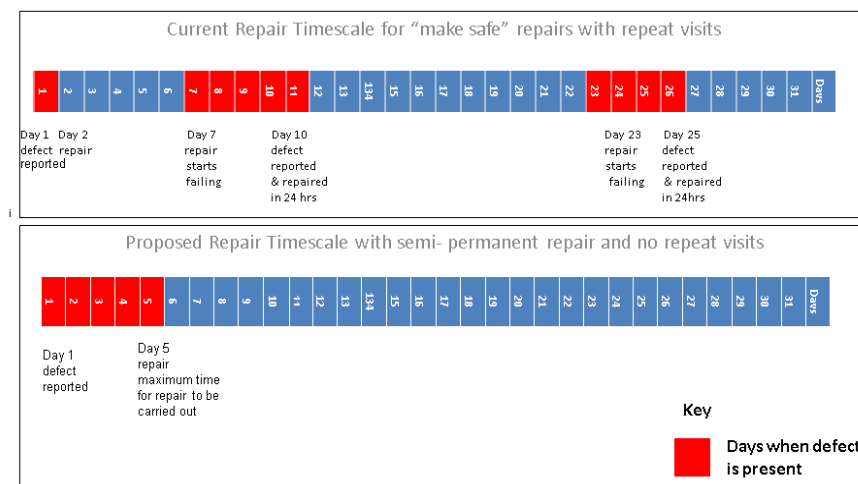
Preventative Maintenance

NCC understood that preventative maintenance treats on average five times more network than the structural treatments predominantly undertaken previously, helps extend the life of the asset, and in the longer term will reduce the amount of structural maintenance and the number of defects. It agreed to focus more of its resources on preventative maintenance at the expense of structural maintenance such as resurfacing and reconstruction, for a five year period. The main road network is in good condition, but the non principal less good, so the focus is on non principal roads, especially those where people live. It was acknowledged that some roads requiring structural attention would remain in that condition for longer, that good communications would be required, and that 'temporary road surface' signs

may be required at times. The preventative approach was supported by an additional £2 million capital expenditure and a further £2 million diverted from within the 2010-11 Local Transport Plan programme. In the first year, preventative treatments increased by 46 per cent. A robust assessment and prioritisation system is in place for structural treatments in a four year programme.

Reactive defect repairs (including potholes)

NCC reviewed response times, including repeat visits where temporary repairs often failed and were then in an unsafe condition until they were noticed, reported and repaired again. NCC's service provider was asked to consider the response period necessary for safe, semi-permanent repairs, bearing in mind the volume of defects. Five days was agreed which meant that the overall period a defect was present was reduced, see diagram.



NCC resolved that the defect intervention levels should be changed from April 2010 to:

- Emergency two hours
(unchanged)
- Category 1 five working days (Monday to Saturday) for defects over 50 mm on carriageways and 25 mm on footways
(from 24 hours for defects over 40 – 70 mm on carriageways, and over 20 – 40 mm on footways, depending on hierarchy)
- Category 2 six months, with work carried out as part of planned maintenance programmes
(from 28 days – three months)

Only minimum defect depth is defined with intervention and repair type otherwise determined by inspectors. Repairs are permanent, semi permanent or temporary, all within the timescales above. Permanent repairs include areas of resurfacing and are considered as lasting as long as the surrounding surface. Semi permanent repairs are guaranteed by MGWSP for six months. By January 2012, nearly 90 per cent of repairs were permanent or semi permanent with the remainder temporary and emergency repairs. The majority of semi permanent repairs are lasting longer than six months and are usually carried out in three to four days. Repairs use standard materials. NCC is assessing a number of proprietary products but has not yet approved any. The scheme is succeeding to the extent that NCC has now agreed to change some intervention periods:

Category 2	Footways	2 months (from 6 months)
	Carriageways	4 months (from 6 months)

Category 2 repairs are carried out in planned area visits over a number of days. Parishes are invited to notify local priority work that can be carried out in a few hours and suitable work is added to the visit. Appropriate Elected Members discretionary spending can also be delivered, and further work is sometimes achieved through collaboration with Community Payback.

In 2011 national recognition was achieved in the Highways and Transport Survey, which reported: "Northamptonshire has achieved very creditable results in the Survey for highway maintenance and has bucked a near national trend for increasingly adverse public views on both 'condition of road surfaces' and 'speed of repair to damaged road surfaces'. Indeed NCC is the only county council (of 23) in the survey registering an improvement in both of these two crunch indicators!"

Benefits

Efficiency savings of £457k have resulted from reducing temporary repairs and from effective patching. Longer term savings of £3.5 million are anticipated from the preventative approach.

Public satisfaction through the National Highways and Transportation survey has increased, as has satisfaction through parish surveys. Claims reduced by 48 per cent in the first year compared with the previous 12 months and customer reports of potholes have fallen by 23 per cent. The rate of network deterioration is beginning to slow, and environmental benefits have resulted from a reduction in vehicle mileage.

Lessons Learnt

NCC took a significant risk in departing from the defect response guidelines in *Well-maintained Highways*, and in being first to do so. It consulted and persuaded its own solicitors, external solicitors and insurers. Some technical staff were also initially sceptical. All were convinced that there was a reasonable and sound basis for the departure and there have been no real challenges. The introduction period from the initial idea, exploration in public meetings, analysis, contract discussions, formal decision and mobilisation was just 5 months. Some stages were carried out

concurrently. This was achieved with leadership, political will, and by ‘catching the moment’.

Not everyone is prepared to easily accept a preventative strategy where roads requiring structural attention are left longer in favour of preventative maintenance elsewhere. To provide some certainty of when their roads will be attended to, a four year programme has been produced. The majority are now prepared to accept this and await a proper job.

Contact Details

David Farquhar, Assistant Director, Transport, Highways and Infrastructure

Email: dfarquhar@northamptonshire.gov.uk

Long Term Investment in Highway Maintenance – Portsmouth City Council

Summary

Portsmouth's 450 km road network had suffered serious deterioration over a number of years, resulting in poor condition scores. Limited investment in highway maintenance was typified by large numbers of potholes and poor public perception. In 1997 Portsmouth was selected as a pathfinder for highways maintenance PFI. The PFI has provided significant investment to raise the road condition to that defined by Portsmouth. The core investment period was completed in 2009. Since then the contractor has maintained the network in a steady state. Securing this 25 year investment has enabled Portsmouth to improve the condition of their network, reduce the amount of potholes and improve public satisfaction as measured through the NHT. Portsmouth has one of the highest public satisfaction ratings for unitary and county authorities.

Background

Portsmouth's network had suffered serious deterioration over a number of years resulting in poor BVPI scores. Insufficient funds were available in order to provide the up-front investment to remove the backlog of maintenance and return the network to a desirable condition. In 1997 it was selected as a pathfinder for Highways Maintenance PFI. This was on the basis of a business case submitted by Portsmouth to DfT demonstrating the benefits of improving the condition of the principal and secondary road network. The PFI contractor was appointed in 2004 and has been operating the network since. During the first five years of the 25 year contract Portsmouth required the contractor to bring the road network to a defined condition. This condition varied according to road class. In 2009 the contractor achieved this milestone. Since then the contractor has been maintaining the network in a steady state, including annual programmes of lifecycle replacement.

Drivers for Change

Poor road condition in Portsmouth had become an issue for the public and consequently local council members. During this time maintenance funding was insufficient enabling only very limited capital investment and funding of emergency repairs. Portsmouth City Council identified that improved road condition would bring many benefits to the local economy and community; including increased public satisfaction and investment in the local economy. The backlog in maintenance as determined from the poor BVPI score required significant funding. This backlog could not be removed by incremental increases in funding. At the time Portsmouth determined, based on their current rate investment the network would have lost all of its value in 23 years. Their approach to funding highway maintenance was therefore not sustainable. Portsmouth considered a number of options for short term investment to remove the backlog. Prudential Borrowing was considered as an option but not considered the best approach because of reduction in future revenue spend as part of the loan conditions. Other options considered included road user charging to generate revenue, but this was considered to have a potentially negative impact on business. Various other options for contracting out maintenance were

considered including contracts for individual areas of the network such as principal roads and structures. The best value option was however to contract out the whole network through a PFI.

Best Practice

Portsmouth has entered into a 25 year contract with a contractor to provide highway maintenance services for their highways network. The contract is based on monthly unitary payments against a specified network condition. The network condition is measured as a condition index. In return the contractor has to:

- Bring the network up to a specified condition in the first five years.
- Maintain the network at that condition in a steady state in the remaining 20 years.
- Repair defects identified through safety inspections including potholes to three levels of response.

The contractor is also required to provide maintenance for all highway assets including carriageways, footways, structures and lighting. All routine maintenance of the network including winter maintenance is also the responsibility of the contractor. The risk meeting the network condition and other management functions have been fully transferred. Payment is made through a Unitary Charge which is linked primarily to road condition.

The contract encourages good asset management as the means of managing the investment in the highway network to meet the contract conditions. The contractor has therefore adopted the principles of whole life costing and developed maintenance programmes that will not only meet the network condition but reduce longer term costs of maintenance. This includes selecting maintenance treatments that will reduce costs through minimising the occurrence of potholes in the future.

The PFI has allowed structural, preventative and reactive maintenance to be carried out by the contractor, ensuring a right first time approach. The contract is designed to incentivise such an approach and minimise repeat work, which would potentially result in contract penalties. The decision process for maintenance treatment selection however rests with the contractor. This approach has ensured that the core investment targets have been achieved well within the requirements of the contract.

The adoption of this approach has improved public satisfaction in highway condition. In the first year of the contract a Mori poll reported 22 per cent improvement in public satisfaction in network condition. Subsequently the NHT survey, when first adopted has also showed a marked improvement. Consequently Portsmouth has one of the highest satisfaction ratings for road condition for unitary authorities.

Benefits

The approach adopted by Portsmouth promotes a fixed capital investment in highways and long term steady state maintenance. The following benefits have been achieved as a consequence.

- Improvement in public perception of the network through the NHT Survey
- Reducing occurrence of potholes
- Reducing claims
- Securing long term capital programme and improving network condition

Barriers

The PFI contract is a long term commitment for 25 years as such it is less flexible to changing requirements, particularly related to public satisfaction and network condition that may occur over this period. In addition there is no flexibility to accommodate financial pressures.

Contact Details

Simon Moon, Head of Service

Email: simon.moon@portsmouthcc.gov.uk

Analysis of Data – Somerset County Council

Summary

Somerset County Council faced repeated questions from press and senior stakeholders around policies, numbers and repairs of potholes. When existing data was analysed to respond to such questions, it became apparent that it was possible to use such information to identify the most vulnerable parts of the network and hence influence decisions on developing and prioritising maintenance schemes. Using the same information, the repair techniques and policies adopted were also reviewed, with a general move towards a long term approach to maintenance. As a result, the additional funding allocated to the Council in 2010-11 by the Department for Transport to deal with the pothole problem, was used on preventative maintenance schemes.

Background

Highway maintenance is managed by five areas in Somerset. Maintenance schemes are developed and assessed by the area teams, who are given a budget, on historic basis, and they have responsibility for allocating appropriate treatments. Typically, around 23,000 safety defects were recorded per year, in a network with a length of approximately 6,500 km, mostly rural. Previously each defect had been repaired independently after it was identified and recorded but it was found that this approach was inefficient as while removing the safety defect it did not address the underlying issues. It also made it difficult for information to be used in decision making for planned maintenance. The council have used hot mix repairs for potholes for the last ten years.

Drivers for Change

The severe winter weather in 2009 and 2010 had led to an increase in the occurrence of potholes. At the same time, political campaigning before local elections had drawn attention to the condition of the highway network. This led to widespread media coverage and repeated questions on numbers and frequency of potholes, highway maintenance budgets and impact of budget cuts. As a result, council staff spent considerable effort responding to these questions. In a parallel project, the system for managing inspections and repairs was automated, leading to the availability of robust data painting a clear picture of where potholes occurred.

Good Practice

The officers analysing data to respond to political and press questions, realised the need for more systematic analysis of data. It was also thought that using data on potholes was a good way of communicating road condition with the public, even though it was recognised that they are a symptom rather than an actual condition parameter. However, none of the condition indicators used included potholes. Therefore, given the detailed information available regarding location of potholes, it was decided that consideration should be given to how potholes data could be used more effectively.

The data was analysed to identify where potholes occurred. To do this, each pothole recorded was allocated to a UKPMS link and section. It was found that 23 per cent of potholes occurred in one per cent of the network. This gave officers the confidence that the pothole problem was manageable and that by targeting the funding in the weakest parts of the network and over an area rather than at individual defects. This approach would lead to more efficient use of resources over the long term.

Further analysis of the data focused on seeking a correlation between number of potholes and surface type and age. This allowed for the service life of different materials to be estimated, leading to a review of the council's materials policy and a move away from the use of Thin Surface Course Systems. A correlation was also investigated between the number of potholes in a section and the SCANNER Road Condition Index (RCI) parameter. It was found that there was a good correlation between wheel track cracking, 3m longitudinal variance and potholes. This was not unexpected as there is a higher likelihood of potholes occurring in sections that already show other signs of surface deterioration.

The council recognised that preventative management of potholes was in line with the asset management approach that was being adopted. Therefore, having proven the link between RCI parameters and occurrence of potholes, the council used these parameters to develop preventative maintenance schemes for the network, rather than repair individual potholes. A lifecycle planning approach was adopted to prioritise these schemes. The additional winter damage money provided by the Department for Transport to help the council deal with the pothole problem was entirely used in preventative maintenance activities.

As part of the process analysing data, the council also reviewed how maintenance activities were undertaken. Previously the council had repaired defects such as potholes independently. As a consequence of the review and better use of data greater efficiencies were identified by through the grouping of multiple defects such as potholes together enabling a single maintenance treatment to be carried out. This has not only created a more efficient approach to maintenance but has also created a better quality of repair.

Where possible, multiple defects such as potholes are grouped together and repaired with one treatment.

Benefits

Somerset County Council has seen the following benefits from analysing pothole data:

- Confidence in identifying the part of the highway network with the highest number of potholes occurring, therefore being able to adopt preventative treatments where they can be more effective.
- Better understanding of network performance and hence more informed decision making, leading to efficient use of resources.
- Reduction in the number of potholes occurring on the network.

- The data is now used to inform decision making in developing and prioritising schemes as part of adopting an asset management approach to highway maintenance.
- A more efficient and systematic way of responding to public and member questions on highway maintenance issues.

Contact Details

David Jones, Asset & Service Improvement Manager

Email: DLJones@somerset.gov.uk

Use of Technology – Somerset Highways

Summary

Somerset County Council carries out all safety inspections on its network and instructs its contractor to carry out repairs. The Council uses a proprietary system for managing defects. The contractor uses an in-house developed system to manage works ordering and the repair works. A fully automated approach has been adopted for managing Category 1 and 2 defects. Both inspection and repair teams use mobile electronic devices to receive instructions and update records. Information is updated in the system in real time using wireless technology. The automated system demonstrated considerable benefit through the improved efficiency of inspections and repairs, as well as the management of claims. It has also allowed for a service that is more responsive to network needs. Somerset Highways were awarded the Highways Magazine Excellence Award for 'Most Innovative Local Authority Project Scheme of the Year 2011'.

Background

In the past, in order to prepare for safety inspections, the inspection routes were defined in the office and marked on paper maps. Paper records were also kept of all inspections. Papers had to be returned to the office, where they were photocopied and manually entered in the Council's system. Repair teams were also instructed using a paper system, and their records were also updated manually. The inspectors and repair teams had to start from the office or depot and return to it every day, to receive instructions and return paper work.

Drivers for Change

Somerset Highways believed that the technology was available to support a fully automated approach for the management of inspections and repairs, which would lead to a more efficient and improved service.

Best Practice

Over the last two years Somerset Highways have moved to a fully automated approach for the management of recording, assessing and repairing Category 1 and 2 defects, including potholes. All planned inspections are managed by a team based in the Council's office in Taunton. The inspectors use portable electronic devices with maps indicating the inspection routes. Any defects identified are recorded on the portable devices, using GPS coordinates. Photographs of the defects are also recorded at the same time. The information is uploaded automatically through wireless technology onto the Council's system. At the same time, any defects that are reported by the public are also recorded on the same system. In this case, area based superintendents are directed to assess whether the reported defects meet the intervention criteria set by the Council.

The public can report defects either through the Council's call centre or via the internet. Defects are also reported through letters, but this covers only a relatively small number. When defects are reported through the internet, an option is given on whether the person reporting the defect wants to be kept informed with progress on inspection and repair; an options that has been declined in the vast majority of cases.

The information from the Council's system automatically updates the contractor's system every 15 minutes. Repairs are allocated to teams, by a team of schedulers based in the depot in Glastonbury. The repair teams receive the information on their portable electronic devices, in real time. When repairs are complete, records are updated with details of repair carried out and photographs of the repair. The information is uploaded into the contractor's system in real time, which then automatically updates the Council's system every 15 minutes.

The portable electronic devices are equipped with GPS tracking. They can also be re-set remotely from the office correcting any malfunctions without the need to return to the office.

The system is fully automated, with no paper intervention at any stage. It must be noted that repairs are only ordered from Council staff. No repairs are instructed if the defect does not meet the Council's intervention thresholds. Potholes are defined as defects with 40 mm depth on carriageways and 20 mm depth on footways. All repairs carried out are permanent; there is no provision for temporary pothole repairs. The system was rolled out in stages, with inspections moving to the electronic system first and repair teams joining at a later date. The fully automated system was rolled out over a period of one year. The portable electronic devices have proven robust, with an average life of around two years per item. The system has proven cost effective, with large files (eg updates to maps) transferred when in the office, through a hard connection to the network.

For the work described above, Somerset Highways were awarded the Highways Magazine Excellence Award for 'Most Innovative Local Authority Project Scheme of the Year 2011'. No changes are planned on the system.

Benefits

Somerset Highways has seen the following benefits from adopting the fully automated approach:

- Efficiencies in inspection and repair teams. All operations are managed remotely with no need for repeat visits to offices and depots. Furthermore, less office support required in preparing maps and managing paperwork.
- No paper work, photocopying, or manual transfer of data between systems, as everything is done automatically.
- Defects are recorded using GPS co-ordinates, reducing locating errors and minimising unproductive time.
- More efficient and robust data collection, allowing easy response to relevant questions and analysis of data to influence decision making (see separate case study).

- Improved communications with the public through clarity.
- Robust records and audit trail. Access to 'before' and 'after' photographs facilitates working between the Council and its contractors.
- Improved management of claims, as it is much easier to track records and electronic records have a much better standing in Court.

Barriers

There were some concerns over whether inspectors and operatives had the skills to use the portable electronic devices. Staff were trained and no difficulties arose.

Contact Details

David Jones, Asset & Service Improvement Manager

Email: DLJones@somerset.gov.uk

Patching Performance (Project Patch) – Staffordshire County Council

Summary

Staffordshire County Council and Worcestershire County Council together with Improvement and Efficiency West Midlands undertook an investigation into the potential for cost and efficiency savings in minor carriageway repair work. This included the identification of defects, materials and repair techniques, programming and scheduling of work and a common specification for repair. As a result the benefits include reduction in labour and plant costs, annual cost savings up to £0.5 million, greater efficiency of operation, an increase in public satisfaction and effective selection of repair giving greater durability.

Background

Normal practice across the region was to undertake a range of different patch techniques, methods of working and contractual arrangements for delivery of the service. Although the needs of the region are recognisably diverse all are served by a highway network that consists of roads ranging from heavily trafficked urban areas to remote rural roads.

Drivers for Change

The main drivers for change were as follows:

- Limited highway maintenance funding.
- Pressure to reduce costs.
- Improve service to customers.
- Improve quality of work.
- Minimise repeat visits to repair the same defect.

Good Practice

Working collaboratively the parties, including the service providers, divided the project into two parts, namely the management of finding defects and programming repairs. Traditionally defects received each week through highway safety inspections or public enquiries would be received in the local office and planned/scheduled on a depot by depot basis. The organisations have driven efficiencies into the process by ensuring that the right information with regard to the defect is directed to the right place so that it can easily be allocated to the most appropriate crew or works programme to do the job.

The call centre team has been integrated with specialist schedulers who prioritise the repair work and a resource team who ensure the correct plant and materials are available for each job. The result is increased clarity and consistent reporting across the authority. Locally based supervisors ensure gangs have sufficient skills and resources to complete the programme prior to leaving the depot. Completed work is fed back and signed off so that feedback can be passed to the customer.

A pothole or patch was deemed a defect requiring a hand laid surfacing repair. Staffordshire CC Highway Laboratory undertook a programme of testing of materials and techniques which was followed by an analysis of costs, works identification, scheduling and works output. This allowed a comparison of various techniques and materials used to be made. As a result good practice was identified, areas for improvement were highlighted and a standard specification for repairs was derived.

The specification for the majority of repairs utilises a single material delivered hot to the depots and stored in static hotboxes. It is transferred to site in mobile hotboxes to ensure that material is of optimum temperature for the repair, this being critical to overall quality. Proper preparation of the repair was also identified as important and all defects are properly prepared to ensure all loose material is removed and sound vertical edges are provided. Tack coating and edge sealing are also used to give maximum durability. Also on roads with a reasonable amount of construction – as opposed to evolved roads – the edge of the completed defect is overbanded.

All defect information including traffic management requirements are collected electronically, with the location referenced by GPS. This transferred in real time to the electronic scheduling system. Work is identified for crews two to three days in advance grouping the work geographically and by defect type to allow maximum productivity.

Also gangs carrying out the work have been established to cater for different size defects. There are hand lay crews where breaking out is undertaken just with hand tools, these cover repairs up to around five m². Larger defects are dealt with by crews using mini planers to break out.

There is an overall philosophy of trying to do larger repairs in sections of failed roads to avoid repeat visits. Only in cases of very cold road temperatures or wet conditions or where extensive traffic management is required are defects given a temporary repair.

Benefits

Staffordshire County Council has seen the following benefits:

- Labour and plant costs reduced by up to 50 per cent for hand lay repairs.
- Identified cost savings between £150,000 and £500,000 per year.
- Greater efficiency and consistency of operation by programming work from fewer or a single location.
- Effective selection of repair method and work planning resulting in a better, longer lasting quality of repair.
- Increase in public satisfaction.

Lessons Learnt

Various lessons were learnt and seen as key to future success. These include the need for positive and enthusiastic commitment from those involved together with an

investment in the training and equipping of patching crews. A detailed specification should be adopted and hot boxes used to improve longevity of the repair; operatives need to understand the characteristics of the material and compaction requirements. Proprietary products and processes have their place as no single treatment is suitable for all eventualities.

Contact Details

Ian Turner, Head of Place Delivery Ventures

Email: ian.turner@staffordshire.gov.uk

Right First Time – Transport for London

Summary

Managing congestion is a key priority for Transport for London (TfL), who recognise that highway maintenance activities can cause significant traffic delays. In early 2010, TfL introduced a permitting scheme to control and co-ordinate works on their highway network and define when these can be carried out. Under this scheme, which is managed by TfL, anyone who wishes to carry out work on the network should ask for a permit to do so. This includes TfL and its contractors as well as utility companies. The number of permits is limited and this has encouraged the adoption of first time permanent repairs to minimise the need for repeat visits to a site. Furthermore, the scope of co-ordination of works between TfL contractors and utility companies has increased.

Background

Transport for London (TfL) manages the Red Route network in London, 580 km of strategic roads which carry a third of the traffic in London. Following the severe winters of 2009-10 and 2010-11 its network suffered a marked deterioration which was partially addressed through additional DfT funding as well as re-prioritisation of its own capital renewals budget.

The strategic nature of TfL's highway network means that a continuous balance must be struck between carrying out works to maintain the network in a safe condition whilst ensuring that the impact of works is minimised. TfL operate a permitting system and have sought to minimise disruption to its network by all activities including reactive maintenance works.

Permitting

A permitting system was introduced in 2010 to allow the highway authority to improve control and coordination of roadworks. This extends to all works whether carried out by utilities or its own contractors. Where possible permits are restricted to the least disruptive times, notably night time and weekend and different works promoters are encouraged to collaborate to minimise the overall number of works taking place on the network.

The number of permits issued to all works promoters was base-lined using noticing data from prior years and target reductions in permit numbers have been set to reduce the overall numbers of roadworks taking place on the strategic road network. Reductions have been achieved through improved coordination between works promoters but also through an increase in first time fix repairs, avoiding the need for return visits.

Cold Mix Permanent Repairs

In 2010 TfL initiated trials of the use of cold mix materials for permanent repair of potholes on their network. The aim was to reduce the need for repeat visits to repair defects and hence, minimise disruption to road users. The early trials were positive

and as a result, HAPAS approved cold mixed materials are now regularly used for temporary repairs. Since the introduction of these materials, it is estimated that over 1,700 repairs have been carried out with very few failures. Before the introduction of this approach, 35 to 40 per cent of defects were fixed on a right first time basis. With the new materials, this number has increased to 55 to 60 per cent. The materials are generally approved for lower speed roads only, but TfL are now considering their use on higher speed roads to minimise the need for multiple works.

Benefits

Benefits from the use of first time repairs using cold lay materials include:

- Reduced disruption estimated at 780 hours within TfL's Central Area contracts;
- Cost savings; and
- Environmental benefits.

Contact Details

Andy Best, Transport for London

Email: andy.best@tfl.gov.uk

Dave Stewart, RingwayJacobs

Email: dave.stewart@ringwayjacobs.com

New Surfacing Materials Specification – Transport Scotland

Summary

Transport Scotland (TS) adopted proprietary thin surfacings in place of chipped hot rolled asphalt (HRA) largely because of the operational benefits of the laying process for these materials in terms of traffic management and disruption. These materials, however, presented significant maintenance problems. Rapid progression from localised failure to widespread issues of early failure highlighted the need for early identification and treatment of potholes. This poor performance of proprietary thin surfacings prompted TS to drive the technical development of an improved specification that adhered more closely to specifications with proven performance in continental Europe, from which the UK materials had been developed. This permitted the use of smaller aggregate sizes which, together with the use of polymer modified binders and fibres, has resulted in dense, impermeable materials. The first pilot in place since 2008 which used straight run bitumen with fibre, a higher binder content and a stringent aggregate grading, has demonstrated the benefits having survived the recent harsh winters 'without a mark'.

Background

Transport Scotland is responsible for the maintenance of Scotland's trunk road and motorway network which totals 3,405 km in length and carries 37 per cent of all Scotland's traffic, including 63 per cent of heavy goods vehicles.

In the early 1990s the UK began to introduce thin asphalt surface course materials based developed from European material specifications to replace existing HRA surfacing. Although HRA had performed well and had an excellent safety record these new surfacings offered potential improvements in noise and spray reduction, and also operational benefits in terms of carriageway occupation during construction and maintenance.

The new surfacings were introduced as proprietary systems under a certification procedure and subject to certain requirements, for surface texture in particular, intended to ensure the safety performance obtained with HRA but which required modification of the original specifications.

However issues with quality and performance, including high profile failures on the M8, of the early thin surfacings led TS to depart from the UK approach and work closely with the local asphalt industry through the Transport Scotland Pavement Forum to drive the development of an improved design and specification for surfacing. This new approach is based on the proven performance of the original materials that have demonstrated excellent long term performance in continental Europe.

Drivers for Change

Widespread and severe early life failures of proprietary thin surfacings presented significant safety concerns in addition to the reduced level of service, poor value for money and increased disruption resulting from the increased requirement for maintenance. In addition to the need to address material design and specification,

the observed progression of failure from defects or points of weakness in the surfacing highlighted the paramount importance of effective supervision of workmanship and practice during placing of the surfacing to avoid 'building in' future points of failure. Detailed attention is required, in particular, to maintaining adequate temperature of the asphalt throughout the paving process to ensure satisfactory placement and compaction. The rapid progression of failure, once initiated, has emphasised the need for early identification and treatment of localised failures to arrest deterioration and preserve the value of the surfacing.

Good Practice

Care and attention to details in the construction process are essential to producing a durable surface course. As construction joints are a prevalent source of distress, it is important to plan the works to minimise the number of joints and to attend to the detail of those joints. Where possible, TS prefer to employ pavers in echelon to produce a surface course without joints. However, as this is generally not possible due to site and/or traffic management constraints, TS promotes the use of bevelled rather than vertical, cut longitudinal joints. This is achieved by requiring the surfacing contractor to fit a conical pinch roller to side compact the joint.

This both provides improved compaction of the loose material at the unsupported edge and also provides an inclined surface for improved application and retention of the bitumen sealant, thus helping to maintain the continuity and impermeability of the surface course. The resulting joint is almost imperceptible in the finished surface.

A key factor in implementing this specification has been the decision by TS to remove an explicit requirement for the minimum value of surface texture in favour of direct measurement of skid resistance to ensure the safety performance of the surfacing. Early life skid resistance is measured using the GripTester and long term skid resistance is monitored using SCRIM in accordance with HD 28/04. The use of a Type Approval Installation Trial (TAIT) for each Quarry and material variant has raised the understanding, workmanship and promotes best practice.

Benefits

TS strongly believe that the 15 per cent premium on initial cost for material to this improved specification will give good value in terms of longer term performance. However, it is important to use the increased investment wisely and premium surfacing is only considered for structurally sound pavements to ensure that its value is not compromised by failure in the underlying structure. The selection of the appropriate material for a particular site is essential, and requires a sound technical understanding of material properties and performance.

Improved durability offers benefits in terms of:

- Better value for money;
- Reduced disruption; and
- Improved level of service.

Barriers

TS as, an intelligent technical client, is conscious that barriers to delivering durable surfacing are presented by:

- Contract forms and operational requirements that constrain network access;
- Reliance on QA regimes that detract from direct supervision of works; and
- Levels of skills and experience within the industry.

Contact Details

Dougie Millar, Materials & QA Advisor

Email: Dougie.Millar@transportscotland.gsi.gov.uk

Improved Quality Pothole Repairs – Walsall Council

Summary

Walsall carried out a Lean review of its pothole response processes following a long period of network deterioration. 84 per cent of pothole repairs were failing after three months and there was widespread public dissatisfaction. The review was undertaken with the full cooperation and involvement of politicians, staff and term contractor. New processes, practices and equipment were introduced and the people supported by a comprehensive change programme.

Efficiency savings of £405k per annum have been achieved. There have been no failed repairs, public satisfaction has increased and claims have decreased.

Background

Walsall was noted as having the worst roads in the country in an Audit Commission inspection in 2001. For a wide range of reasons the council was subject to special measures and as part of this the Highways Service was separated from the general Streetcare service. Outsourcing of the direct labour organisation was begun in 2007 and completed in May 2009.

More recently there was an 84 per cent failure rate in pothole repairs after three months, even though they were permanently repaired in the first instance. It had been decided previously prior to the Lean that the two sets of inspectors would become generic. One set carried out walked safety inspections of the public highway and the other did NRSWA inspections.

Repairs often used inappropriate materials and very poor workmanship, including not cutting out and cleaning patches, materials well below specified temperature, not painting patch edges, and poor compaction.

Drivers for Change

There was widespread public dissatisfaction with the poor repair of potholes and repeat visits. The number of potholes and costs were increasing, repairs were being carried out at the expense of planned maintenance, and the Council was not able to get on top of the problem. The situation was unacceptable and poor value for money. Morale of inspectors and operatives was low. All this, and with a new term contractor in place, provided the incentive and opportunity for a new approach.

Approach

Walsall embarked on a Lean review of pothole repairs in 2009 to drive efficiency savings and to change the culture within the service. It was supported by a grant from Improvement and Efficiency West Midlands to engage specialists for Lean support and training, with the project run by Walsall and its term contractor Tarmac. The purpose of the project to 'provide a safe and free flowing network' was agreed. Data on current practices was collected and reviewed, followed by extensive engagement with staff and operatives at all levels. Inspectors were now highways specialists. The definition of a pothole, ie minimum 25 mm depth and 300 mm length

in footways and minimum 40 mm depth and 200 mm length in carriageways, and the response time for safety defects, ie 24 hours, were unchanged.

The new process and pothole repair specification were introduced in April 2010. Hand held computers for inspectors and operatives were introduced. Most potholes are now repaired using HRA in both carriageways and footways to alleviate the need to store more than one material and also to ensure a suitable material for all repairs is used. Material is stored in a depot hot box and repairs supported by purpose built 'Roadmender' vehicles. Patches are cut out, sides painted with tack coat and, with the exception of braking areas, the finished patch overbanded with 100 mm wide bitumen with high skid resistance chippings. A small number of potholes in traffic sensitive areas are made safe using temporary repairs and then permanently repaired within a week.

As the new process developed it was decided to improve the riding quality of patches over five m² by planing and machine surfacing. Walsall is considering a further development to extend safety defect response time to five days. Works will then be carried out on a whole street basis, possibly using short closures, and coordinated with lighting, gully emptying and other planned maintenance. Safety defects on busy junctions and in wheel tracks will continue to be temporarily repaired in 24 hours and then permanently repaired within five days. It is hoped that public satisfaction will be further improved and that productivity will increase, bringing further efficiency savings.

Benefits

Efficiency savings of £405k pa have been achieved through reduction in the number of inspectors and back office staff as a result of the introduction of technology and reorganisation, more efficient repair operations and reduced materials waste. There have been no repair failures since introduction of the new processes and both network condition and morale is improving. Claims have reduced. Public satisfaction through local card surveys following works has improved, and there has been a high rate of response to the surveys.

The Lean skills transferred to Walsall are now being used in other areas of service.

Lessons Learnt

The most significant difficulty identified was the 'emotional journey' of exposing old systems, roles and behaviours and introducing new processes. Active support and commitment from the Cabinet portfolio holder, Walsall's director and Tarmac's director were essential. Strong leadership with good interpersonal skills were required to support individuals through the change.

Contact Details

Marion Parry, Acting Group Leader Roadworks Management

Email: parrym@walsall.gov.uk

Lean Methodology – Worcestershire County Council

Summary

The ever increasing number of defects in the highway was causing an increase in public dissatisfaction with the service. Improvement was essential and Worcestershire County Council determined that a Lean approach would be a good way forward. Worcestershire used ingenuity rather than cash; investing in, and maximising, the use of available resources both intellectual and physical. The step change that has occurred having undertaken the process has been extremely beneficial and recognised widely. Benefits include a change in culture, consistent approach; reduction in gangs with an increase in productivity, no backlog of pothole repairs, reduced enquires hence reduced administration and an enhanced perception of the service resulting in additional budget provision.

Background

The repair of defects following safety inspections and programmed maintenance were not coordinated as well as they could be hence the repair process was inefficient. Public perception of the highway service was very low resulting in dissatisfaction among elected members.

Drivers for Change

A variety of historic issues affected the efficiency of reactive works including:

- Inefficiencies in the process; duplication of effort; little process control.
- Variations across the authority between areas.
- Poor response times; issues with enquiry status; frustration with system.
- Customer and elected member perception of Highway Service very poor.
- Public enquiries on the increase (+7,500 open enquiries).
- Low team motivation.

Approach

Worcestershire County Council, together with their service provider, undertook a genuine Lean process using a third party facilitator to review the whole life processes including looking at culture and people involved. As part of the process it was imperative to focus on customer outcomes and to appreciate the issue from their perspective thus improving customer perception. Furthermore project goals included improving tax payer value for money and productivity, eliminating overdue defects and embedding partnership behaviour and culture.

Worcestershire considered whether or not they could apply Lean manufacturing techniques to the highway maintenance business and it was deemed a positive way forward. To achieve their goal they needed to consider integrated team-working, cultural change, a focus on process, elimination of waste and engaging expert help.

To achieve this they undertook 11 cross functional workshops involving over 60 staff. The Lean workshops engaged inspectors from WCC and operatives from Ringway. As a result they identified information critical to success, eliminated set up failure modes and standardised instructions and vehicles.

The Lean process undertaken by the integrated team highlighted the 'current state' through process mapping, inconsistencies in processes across depots, duplication of data entry and excessive supervisory and administrative effort resulting in up to three days processing.

It was evident that there was an overload forcing supervisors to 'paper shuffle' rather than plan and supervise however through the Lean process there was a rapid improvement in attitude, behaviour and culture which was key to the overall success of the project.

Benefits

Worcestershire County Council has seen the following benefits:

- Management and grass root culture has changed.
- Demonstrated that Lean works in the highway environment.
- Lean champions have developed, team motivation increased.
- Countywide consistent approach.
- Defects resolved per gang per day up from 3.5 to 12 and the cost down 75 per cent. This equates to a 300 per cent increase in productivity.
- Reactive gangs reduced from 25 to 16 resulting in £1 million per annum savings.
- Improvements to system with administration cut by 50 per cent.
- Overdue defects/jobs eliminated hence reduced enquiries.
- Enhanced perception of the service resulting in additional budget provision.

Lessons learnt

Various lessons were learnt and seen as key to future success. These included engaging expert help to lead through the process, ensuring all parties were involved and the creation of a focus area where discussions and attention could be focussed on the issue at hand. In addition it is imperative to recognise from the outset that the process will affect both the culture and the people within the organisations and finally to put adequate time in to realise the full benefits.

Contact details

Ian Bamforth, Highways and Countryside Manager

Email: ibamforth@worcestershire.gov.uk

ACKNOWLEDGEMENTS

Bath & North East Somerset Council	Craig Jackson
Bath & North East Somerset Council	George Bottin
Blackpool Council	Will Britain
Dorset Highways	David Blackburn
Hampshire County Council	Steve Spender
Hampshire County Council	Clive Griffiths
Lancashire County Council	Dave Rigby
Leeds City Council	Andrew Molyneux
Leeds City Council	Russell Martin
Northamptonshire County Council	David Farquhar
Portsmouth City Council	Simon Moon
RingwayJacobs	Dave Stewart
Somerset County Council	David Jones
Staffordshire County Council	Ian Turner
Transport for London	Andy Best
Transport for London	Steven Dennis
Transport Scotland	Dougie Millar
Walsall Council	Marion Parry
Worcestershire County Council	Ian Bamforth

GLOSSARY

BVPI	Best Value Performance Indicator
CTS	Carriageway Treatment Surveys
CVI	Coarse Visual Inspections
DfT	Department for Transport
DVI	Detailed Visual Inspections
FTS	Footway Treatment Surveys
GIS	Geographical Information Systems
GPS	Global Positioning System
HAMP	Highway Asset Management Plan
HAPAS	Highway Authorities Product Approval Scheme
HMEP	Highways Maintenance Efficiency Programme
HRA	Hot Rolled Asphalt
MGWSP	May Gurney WSP
NCC	Northamptonshire County Council
NHT	National Highways and Transport
NRSA	New Roads and Street Works Act
PFI	Private Finance Initiative
RCI	Road Condition Index
SCANNER	Surface Condition Assessment for the National Network of Roads
SCRIM	Sideway-force Coefficient Routine Investigation Machine
TAIT	Type Approval Installation Trial
TfL	Transport for London
TS	Transport Scotland
UKPMS	UK Pavement Management System