Highways, Street Lighting and Winter Maintenance Services

Innovation Awards

Environmental Services Innovation Awards

Contents

This brochure contains everything you need to know about the winners and finalists in the Highway Services Innovation Awards 2017, 2018, 2019 and 2020.

For exhibition and sponsorship opportunities at any APSE event, email Matt Paton at m.paton@spacehouse.co.uk

Street Lighting Finalists

Knowsley Metropolitan Borough Council

The Dragon Patcher

Knowsley Council, in partnership with SSE Enterprise, successfully delivered a four year, multi-million pound street lighting and traffic sign improvement programme. The major investment introduced the latest energy efficiency technology. Illuminated bollards were replaced with non-illuminated self-righting bollards, Central Management System (CMS) technology was installed in new and upgraded equipment, and LED equipment was introduced for new housing developments and regeneration schemes. As well as contributing towards the built environment, the Street Lighting and Traffic Sign Replacement Programme supported the Council's key aims of attracting business investment and building new houses. The improvement programme has also meant energy and maintenance cost implications have been minimized; the overall inventory for lighting (1.9%) and signage (17%) has been reduced, bringing revenue savings of £40k per annum, or £800k for the PFI contract life.

Northumberland County Council

Northumberland Street Lighting Modernisation Project

Energy emissions and power usage incurred by Street Lighting in Northumberland is significant and costly. To deal with this challenge the objectives of this project are as follows:

- To replace all life expired street lighting columns and modernise the street lighting stock in Northumberland.
- To invest in new technologies to allow a whole life cost approach be used to manage the asset.
- Realise a reduction in the Street Lighting Maintenance Budget by 50%.
- Realise a reduction in the Street Lighting Energy Budget by at least 60%.
- Introduce a new model of working for the Street Lighting Service.

Bolton Council

Lighting the Way for Bolton's "Smart Green" Future

In April 2015, Bolton Council introduced a three-year LED street lighting programme. This, combined with a new Central Management System (CMS), was part of the initial phase of a seven-year package of measures designed to reduce energy consumption, carbon emissions and achieve savings. The overall programme required an investment of £10m. However, the Council has predicted they will make savings of £14m over 20 years and will reduce energy use by around 50%. The savings link to the Government target of reducing carbon emissions by 80% before 2050 and the Council's participation in the Greater Manchester Climate Change Strategy 2010-2020, which seeks to cut carbon emissions by 48% between 1990 and 2020. Added benefits are being realised through the platform for future Smart City technology.

Winner

Kingstown Works Limited

Super Six - Lighting the Way

Due to having a proven track record of delivering customer focused, value for money construction and maintenance services, KWL was approached by Hull City Council (HCC) in September 2012 with a proposal to transfer in HCC's Street Lighting department.

At the point of transfer, the Street Lighting department was under-resourced, under-achieving and had a demoralised workforce. KWL had never previously delivered Street Lighting works. With no management structure being transferred over with the department, understanding the service requirements and turning its fortunes around was a significant challenge.

Rebranding the service was vital in demonstrating to employees that KWL was committed to providing necessary investment to facilitate the transformation. Giving the service a new identity kick-started the improvement process and the team immediately felt valued.

Within the first month, a skills audit was undertaken to identify the level of training each member of the team had. A training programme costing in excess of £50,000 was implemented and delivered within six months of transfer, which helped close the skills gap.

The Street Lighting vehicles were assessed and a vehicle stock management process was introduced. The vehicle assessment proved that some of the vehicles were not t for purpose. A

16.8m mobile elevated working platform was purchased to add much needed capacity to the fleet. A vehicle management system was installed allowing more effective job allocation through direct interface to KWL's IT system. By introducing technology facilitating real-time contract monitoring, services were streamlined and repair turnaround times were dramatically improved.

Within a period of six months, KWL overcome what seemed like insurmountable obstacles in turning around the fortunes of HCC's street lighting department. Not only did KWL reduce costs, it did so whilst greatly improving service performance. Daily complaints were also reduced to zero, resulting in a huge reduction in back-office time.

Following the early success of the Street Lighting transfer, KWL became a trusted partner of HCC. In 2015, KWL were again approached by HCC to develop a scheme whereby 36,000 street lighting assets would be upgraded to LED technology.

This £9M project commenced in November 2016. Due to the shortage of suitably skilled labour available to undertake this work, six support operatives (driver/labourers) already employed by KWL were voluntarily transferred to the Street Lighting team. The team was 'up-skilled' through an intense training programme, tailored to the needs of each individual.

The training covered MEWP, harness, ihab, Chapter 8, LGV, CPC, Electrical awareness/repair and G39. Through this bold and substantial investment, KWL were able to o er a unique and fantastic opportunity for existing lower paid employees to develop valuable lifelong skills and experience, rather than procuring a contractor to undertake the works. The training for these workers - known as 'the super six'- ran from July 2016 and was completed in November 2016.

Within one month of the Hull City of Culture year 2017, KWL was commissioned to work in partnership with the Police Service and The Culture Team to facilitate the removal of street furniture allowing a 75 metre wind turbine blade to be moved from the Docks and positioned in the City's main Victoria Square.

The secret operation began at 10pm Saturday evening and was completed by 9am Sunday morning. The operation involved the entire 18 person Street Lighting team removing and reinstating 50 street lighting assets.

Since its transferral into KWL 5 years ago, the Street Lighting team has become one of KWL's star performers; delivering the repair and maintenance of Hull City Council's Street Lighting stock. The failing service had a backlog of over 1000 incomplete repairs at transfer. Only one year later, that had been reduced to just 66.

Highways Maintenance Innovation Awards Finalists

Cheshire East Council

Asset Management Innovation in Highway Drainage Maintenance

There are currently over 92,000 gullies in Cheshire East. With the number of flooding events growing and increasing pressures on revenue budgets, it was recognised that a more intelligent and risk-based approach to highway drainage maintenance was required. In order to tackle this industry-wide problem in Cheshire East, and to be consistent with the Council's Highways Asset Management Strategy, the Council established a Gully Care Team; investing in fleet, plant, technology, training and equipment. Condition data has been collected for each gully. By having a better understanding of the condition of drainage assets, the Council was able to effectively schedule maintenance and repairs, and continually update asset information. The team has improved communications with customers; reducing complaints from 3,400 to 2,500. Most importantly, the team has been able to reduce the impact of rainfall events.

apse Innovation Awards 2017

Dorset County Council

Ecological innovation on the A338 Bournemouth Spur Road

The Council developed an innovative new approach to preserve and enhance highly protected species as well as internationally protected heathland before, during and after successful completion of a major road reconstruction. The A338 Bournemouth Spur Road is Dorset's busiest road carrying 59,000 vehicles per day. The road also runs through several blocks of sensitive heathland; home to all 6 British species of reptile. To protect the heathland and habitat during reconstruction of the road, the Council collaborated with Natural England, the Environment Agency and independent specialists to carefully disperse protected species out of the works corridor. This was achieved through designing out habitat attractive to particular species and enhancing habitat on directly adjacent heathland. The approach provided notable savings on future verge maintenance costs and is estimated to have saved £450k compared to the usual licensed capture, rescue and relocation method.

Dudley Metropolitan Borough Council

Repairing pot holes by working smarter not harder

Historically, pothole repairs in Dudley had typically been seen as a low quality and temporary repair solution. Traditional techniques were noisy, dusty and placed the Council's workforce at risk from hand arm vibration syndrome and manual handling injuries. To remedy this, the Council established a small project team to look at the end to end pothole repair function and to identify any opportunities to work smarter and more cost-effectively. The team then implemented new ways of working for the repair of potholes using an articulated telescopic loader fitted with a planer attachment. The cost of 'planer' pothole repairs compared to traditional repairs has shown efficiency gains of circa 17%, equating to cash savings of £18,742. The loader has reduced noise and dust levels, causes less damage to the substructure of highways and presents no vibration risk to the workforce.

East Ayrshire Roads Alliance

Ayrshire Roads Alliance

The Ayrshire Roads Alliance is the only shared integrated roads and transportation service in Scotland and was established on 1 April 2014. It was formed in response to the Christie Commission. Its overall objective is to improve roads and transportation in East and South Ayrshire by fully integrating two former roads services in the most cost effective, environmentally sensitive and socially responsible way. In its first 2 years, the Alliance has implemented a net revenue saving of £1.35 million through reduced plant and vehicles by 2023/24, secured capital investment of £10 million by South Ayrshire Council over five years and reduced environmental impact through ISO 14000 accreditation. The Alliance has also improved road conditions; In 2015/16, 39.4% of East and South Ayrshire's road network was classified as requiring maintenance treatment, a decrease from 45.3% in 2010/11.

North Ayrshire Council

Innovation in Road Maintenance

The challenge for the Council's road service is to provide more with less. A review of work practices and methods was essential to enable efficiency savings. The Council specifically targeted efficiencies in the provision of road maintenance by addressing carriageway improvements, the cost of temporary repairs and multiple contracts for external works. The council aimed to establish whole life costing treatment cycles rather than worst first, investigate new methods/equipment that could provide first time permanent repairs, and examine current procurement methods for external works. The innovative improvements made resulted in significant savings which have been re-invested into the network. Through effective targeting of resources, The council has also improved its Road Condition Indicator (RCI) by 10.1% since 2011, being recognised as the 4th most improved Authority over that period.

Peterborough City Council

Gritcam

Faced with continued budgetary pressures and the need to deliver Highway Services as efficiently and effectively as possible, the council developed Gritcam. The idea behind Gritcam was to utilise precautionary gritting treatments to capture asset data, and in particular, the reflectivity of Road Markings, Studs and Signs. An HD quality camera was fitted to the dashboard of a 26ton gritter to record the route being travelled on each precautionary treatment. The cameras produce excellent footage. The recordings give the inspectors the opportunity to be able to use the footage when they receive reports from members of the public regarding defects. Gritcam also takes out the need to have two highway inspectors out on the network at night; saving approximately £142.10 per hour. Additionally, Incorporating the night time reflectivity survey within the gritting operation takes out the risks associated with night working and driving for the highway inspectors.

Winner

South Gloucestershire Council on behalf of the Southwest Highways Alliance (SWHA)

Highways Infrastructure Resilience Assessment Modelling (HIRAM) tool

The importance of road networks to the national economy and delivering local government services is enormous. Weather events and the changing climate present a significant risk to the integrity of local road networks. To mitigate this risk, the 15 authorities in the SWHA recognised the need for a cross authority and collaborative approach to maintaining a reliable road network.

In response to the publication of the Transport Resilience Review, the SWHA set up a Task and Finish Group in 2014. The Group brought together knowledge within the region to investigate and produce a methodology for the highway authorities to use. They could then assess the resilience risk on their networks and investigate how to tackle the increasing problems presented by the increase in extreme events affecting the network.

Working in collaboration with local authority highways specialists, the Met Office, Climate UK and the Environment Agency, the SWHA was able to create the HIRAM tool.

HIRAM is a web based tool that helps an authority identify the weather risk on road networks, especially those networks critical to providing an integrated highways transport system. The tool allows the authority to qualify and quantify the risk weather events present to the continuity of that network. It also assesses the economic benefits of the resilience measures.

The tool kit is structured so it can be used in full or in part depending on the requirements of the users and their position in developing their resilience approach. It helps answer some key resilience questions by bringing together in one place all the information needed to objectively assess resilience risk and financially evaluate impact and adaptation.

HIRAM is simple to set up and use. For each risk location, a GIS location pin is located on the mapping and a simple fully-editable form is completed with the relevant information. The form contains tool tips within it and an accessible user guide, so everything needed is at hand.

HIRAM is able to provide outputs on an individual location, a route or at a whole network level. The outputs can all be exported direct from the tool into Microsoft Excel, meaning an authority can slice and dice the information in whatever way suits their use or audience.

The tool supports and encourages collaboration between authorities by enabling cross authority outputs to support regional stakeholder engagement such as LEPs. Not only does it provide useful financial outputs, it forms an important part of any authority's asset management approach. HIRAM also encourages greater understanding of resilience and climate change within an authority's service teams; enabling them to collaborate more effectively when tackling resilience risk issues.

HIRAM is in use by the 15 South West Authorities and recently the Eastern Highways Alliance consisting of 11 Highway Authorities has joined in. The tool is relevant to any authority large or small, rural or urban and can be applied to a location, route or whole network.

Winter Maintenance Innovation Award Finalists

East Riding of Yorkshire Council

Winter Service Resilience and Development Programme

Over a number of years, the Council's Winter Service has been developing its systems and processes to ensure it is resilient and able to deliver a consistent service in line with Council Policy. To ensure this is the case, systems and procedures have been developed which ensure that the investment the Council has made in modern equipment is used to best effect. Through a regular vehicle replacement programme, the Council was able to achieve a modern fleet, all of which have the same salt delivery body. This assists operatives as they are all familiar with the equipment and facilities. A comprehensive management system - 'WINLOGIX' – has also been introduced which is used to manage everything from weather monitoring to managing the call out and eventually paying timesheets. The Service now also delivers training in-house, resulting in higher satisfaction levels from the drivers.

Harrow Council

Winter Service

As the Council's revenue budgets have been reduced by approximately 35%, it was necessary for the Council to review its Winter Service and ensure that the cost of the service could be reduced to fit with the revised budget. The Council worked with their term contractor, Kier, to re-evaluate their service and identify where efficiencies could be made. The Council considered the capacity of the lorries, how efficiently they were being utilized and what effect was made by using an unnecessarily large fleet. The Council opted to rationalize the service from an existing six routes to three. This allowed for a reduction in the labour resources required to operate the service. By making these savings, the Council made savings of approximately £70,000.

Northumberland County Council

Improving Winter Services in Northumberland

As a large rural county with five climatic zones, delivering winter services and getting messages out to residents, workers and visitors is challenging. A number of erratic winters with heavy snowfall and flooding found the Council assessing their Winter Service delivery. With costly downtime and repairs, the Council's aging fleet of gritters was in need of replacement. The Council developed a three point approach focusing on a communications review, acquisition of a multipurpose fleet and income generation combined with partnership development. The £1m investment in 7 new vehicles significantly reduced the need for intervention, maintenance costs and downtime. The Council entered into partnerships with Colas and the North Pennine Link Group. The council also adopted a more informative approach about the reasons behind decisions and used more modern methods to get the message across.

Winner

Dundee City Council / Tayside Contracts

Retrofitted Automated Gritting Control Technology

The Dundee Road Maintenance Partnership (DRMP) team is a combination of Dundee City Council road maintenance staff and Tayside Contracts operational staff. The team delivers all aspects and elements of the Council's road maintenance service including: inspections, engineering design, asset management, construction operations and winter gritting. The team consists of 25 professional, technical and administrative staff and a direct labour resource of 60 road workers.

Winter service is a fundamental element of the Council's road maintenance service. The service is entirely funded through the revenue budget. In recent years, there has been a continued drive to maintain the exemplary service standards which Dundee's residents and businesses expect and rely on, while achieving cost reductions through efficiency. Easy win efficiency measures and operational delivery efficiency improvements have been implemented and realized in previous modernization reviews.

The remaining scope for value reduction in service delivery now lies in the harder to reach and more ambitious projects. A key area the team identified for value savings was in automation; using GPS and computer programmed control to vary salt deployment in salt spreaders. Despite being relatively new to the market, The DRMP embraced this technology and commenced a programme of fleet renewal; moving to purpose-built, GPS-enabled, automated vehicles in 2015 (Schmidt Autologic vehicles). To expedite the fleet replenishment programme and to achieve an earlier saving return from the efficiency system, the team embarked on an innovative project to retrofit the same system capability in existing fleet vehicles.

The project associated 79 task activities with a delivery and implementation duration of 6 months. Effective project management controls were operated throughout the project to ensure programme progression and robust financial planning. Being a new technology development, the project encountered a number of unforeseen barriers to progression, most notably during the hardware installation phase as the equipment available wasn't purpose built for the nature of the project task. Additionally, the testing and implementation phase encountered system errors associated with GPS tracking and also the practical realities of transferring computer generated operational processes to physical delivery plans.

The retrofitting of automated material deployment control to existing winter fleet vehicles is currently unique to the DRMP. The system has been developed by the DRMP staff in conjunction with a specialist software consultant and a winter fleet manufacture. While other winter service providers have started to phase in vehicle replacements with purpose-built technology-enabled vehicles, this is still very much in its infancy. Without the ability to retrofit systems to existing plant, it may take a decade to modernize fleet capability and fully achieve the potential efficiency savings (based on a phased vehicle renewal programme). The DRMP team has promoted this innovation both regionally with our neighbouring authorities (with whom we directly collaborate), and nationally through the Society of

Chief Officers of Transportation in Scotland (SCOTS).

The automated control of material deployment has reduced route salt use requirement by 30%. In monetary terms this is £100,000 annual revenue saving, which represents 7% of the winter maintenance budget for Dundee City Council.

This modernization project has not altered the service standard in that the same routes are still treated to the same standard and same service delivery obligations. The Council requires to achieve revenue budget savings. This project represents one of the few examples of being able to achieve savings by advancing technological capability and conceptual aspirations.

A secondary benefit of this innovation is in the project's environmental credentials. The lessening of salt usage by 30% results in a lesser volume of sulphate run off entering the drainage system. Additionally, reductions in route travel length achieved through optimisation, coupled with reductions in vehicle material loads carried, lessens fuel use. These direct environmental benefits continue internationally as the Council imports less salt from the Mediterranean; ensuring a smaller carbon footprint through both the extraction process and haulage.

Street Lighting Finalists

Glasgow City Council

Intelligent Street Lighting

Glasgow City Council (GCC) was successful in a bid to the European Regional Development Fund (ERDF) 8th City Programme to secure funding for the procurement and delivery of an Intelligent Street Lighting (ISL) Network in Glasgow City Centre. The project includes the installation of LED lights along with a Central Management System (CMS) to obtain further energy efficiencies and extend a Low Bandwidth Wireless Canopy to enable the deployment of sensors. This will enhance the Smart City maturity level of the City through the deployment of ISL and associated Smart infrastructures. Through the addition of data collection devices such as sensors and cameras, intelligent street lighting infrastructure will be used as a platform to host a variety of applications including environmental monitoring, traffic optimization, smart parking and public safety. The collected data (real time or historical) will be used to improve service delivery i.e. bin collections, car parking etc.

Renfrewshire Council

LED Street lighting Replacement Programme

Renfrewshire Council embarked on the ambitious "Street Lighting Investment Strategy" to transform 30,756 street lights from sodium to LED Lanterns through an innovative £11m capital investment fund within a 18 month period. Renfrewshire's sodium street lights cost over £2.5m annually, in electricity and operational maintenance costs, and were responsible for 20% of the Council's total carbon consumption and associated footprint. The transformation has successfully reduced carbon and electricity consumption by 64% and reduced operational costs by £1.4m p.a. Renfrewshire leaped from 26th to 1st place in the Scottish Futures Trust (SFT) tables (released October 2017) having converted 98.5% of all street lights to LED lanterns, leading the sustainability and innovation agenda for street lighting technology.

Wigan Council

Street Lighting LED project

This review of the Wigan Council street lighting service was initiated through the Council's efficiency agenda and street lighting 'Fresh-Look' service review process. This review provided the Council with the opportunity to embrace new LED technology, increase the resilience of the service and optimise the cost of delivering the service; thereby reducing the environmental impact and energy consumption. The Council commenced its street lighting LED replacement programme in April 2014 and completed the project in March 2018. Thus far the project has: installed 31,775 lighting units with CMS controls; replaced of around 3,500 life expired street lighting columns; reduced energy consumption by 51%; reduced carbon emissions by 3,000 tCO2; reduced annual street lighting energy cost by over £800k (to date) - compared with 'do-nothing' scenario; and reduced the annual number of street lighting faults by over 50%.

Innovation Awards 2018

Winner

Bolton Council

Lighting the Way for Bolton's "Smart Green" Future.

In 2015, Bolton Council's cabinet approved a budget report to progress with the implementation of £43m savings options. Included within these options was the need to identify sustainable and alternative service delivery models to help deliver the savings needed. In addition, the council's cleaner, greener strategy makes a clear environmental and financial case for remodelling services and opportunities to reduce energy consumption and carbon emissions, coupled with associated cost benefits to the public purse.

The LED programme combined with a new Central Management System is an innovative approach designed to reduce energy and carbon omission issues. The CMS provides an effective approach to street lighting management, which is playing an important role in meeting revenue reduction demands.

The aims of the project is to replace existing stock with LED lanterns to meet the current British Standards and also ensure that design lighting levels are met – with a view of having "The right light in the right place at the right time".

Mid-February 2018, the project has successfully delivered: 24,670 LED's in 4,323 streets have been upgraded; 92 tonnes of existing lantern materials has been recycled back into the environment, to which Bolton won a National Live Lux Award for recycling to which other Local Authorities are copying Bolton's processes; 49.13% energy cost reduction and a carbon tonnage saving of 5,582 tonnes.

Bolton demonstrated excellent partnership working involving a neighbouring Council, in-house team, AGMA framework contractor and as a result the programme was on target to finish in April 2018.

LED units use less energy and last six times longer compared to the standard lantern. Built in CMS allows the Lighting Engineer to govern exactly when to set variable lighting levels to individual lighting points throughout the Borough. This allows control and capping of the energy as and when it is needed, thus reducing bills further.

The LED programme has resulted in a reduction in energy costs of 49.13% (£961,097) when comparing 1 April 2014 – 31 March 2015 (£1,956,097) with 1 April 2017 – 31 March 2018 (£995,000), based on 11.48p KwHr. 92 tonnes of existing lantern materials has been recycled back into the environment with a further reduction in carbon tonnage saving of 5,582 tonnes. Furthermore, if Bolton did not invest in the Residential LED replacement, a payment of £2,131,000 for energy alone would have been paid to the supplier.

Longer term revenue savings will also be made on maintenance, which are expected to come to fruition later in the programme. These include; the current lanterns have a short life (4 yearly maintenance cycle), compared with the LED lanterns which last for 20 years, which are much more sustainable; use of the CMS 'fault detection function' means a reduction in site visits; reduced costs for materials associated to Lamp, capacitor and ballast replacement, which has been calculated at 17.35% over the 3yrs.

The CMS provides the street lighting team automatic on-site notifications for each individual lantern status which can then be dealt with in accordance with priority and weekly schedules. Residents with queries or complaints were given direct access to the Councils 'Streetcare' team and dealt with individually contacted and issues/outcomes recorded.

All residents and local businesses were notified in advance on the associated benefits of the LED programme which is featured quarterly in the Bolton News and proactive in promoting it on the Council's Twitter and Facebook as a mechanism to voice comments, issues and concerns.

To Date Customer satisfaction has been well evidenced, since its roll out; only 1.2% of complaints have been received pertaining to LED's being too bright, 99% of these complaints were resolved satisfactorily following the introduction of variable lighting profiles through the CMS.

The overall feedback, proves improvement in public lighting and the new LEDs are visibly brighter and keep the streets well-lit and safer, for pedestrians, cyclists and drivers.

Highways Maintenance Innovation Award Finalists

Dorset County Council

"Working Together" A Collaboration Between County, Town and Parish Councils to Deliver Highway Maintenance In Dorset.

Reduced revenue maintenance funding is a common problem for Highway Authorities across the UK. In Dorset this has seen the revenue budget reducing from just below £9 million to £4 million since 2011/12. "Working Together" is an initiative that offers Town and Parish Councils an opportunity to commission minor highway maintenance activities that can no longer be financed, or alternatively, supplement current activities by funding additional work cycles that have been reduced in frequency. The scheme has promoted increased collaboration with participating Town and Parish Councils - to date the scheme has seen 40 Town and Parish Councils engaging in the process - and seen the reintroduction of works programmes previously under threat within their respective areas.

Via East Midlands Ltd (Nottinghamshire County Council)

Creation of a collaborative local authority joint-venture company to deliver highway services in Nottinghamshire

In response to the unprecedented challenge faced by local government, in 2016 Nottinghamshire County Council and Cornwall Council created a collaborative, Teckal complaint company called Via East Midlands Ltd. Via delivers a wide range of highway design, network management, construction, maintenance and fleet services to the Council and to external customers. At the end of the first full financial year, Via had secured and delivered £3.8m of external business, turnover had grown from £39.9m in 2016/7 with an expected £55.7m in 2017/8. By the end of the second year, Via will have delivered a dividend to its shareholders of almost £2m. By March 2017, 36% of employees voluntarily moved from TUPE protected employment contracts to Via contracts - a sign of genuine buy-in to the company. The external income means that the Council can continue to sustainably deliver high quality highway services for residents, visitors and the travelling public of Nottinghamshire.

Northumberland County Council

Channel Shift for reactive agile working process

The Council undertook a full review of its highway inspection with a view to using technology more effectively to improve the time management of resources. The Council also wanted to create a system which would reduce the backlog of over 9,000 potholes within the County in 2015. The old system was overly complicated and there was a large amount of "back office work" required so the Council devised a system that is fully remote and promotes agile working within the County. The new system helped to improve time management, audit regime and reduce the amount of time that all parties spent in the office or at the depot. The performance of the inspection regime and quality of repairs has increased 10-fold.

Oxford City Council

Innovative Income Generation

Oxford City Council's Highways and Engineering Team took an innovative approach to solving the risk of central government budgetary cuts by identifying opportunities to generate additional income streams utilizing; expert contracts managers, highly trained workforce, and state of the art fleet and plant. This was achieved by developing the team's reputation and brand to ensure new and existing customers repeatedly used the Council's services. The Team also invested in additional plant and fleet, recruitment, training and development in order to facilitate winning additional work. This additional income generated has been reinvested in the teams' expansion and back into Oxford City Council in order to maintain its high level of public services in its continued aim to be a world class city.

Cambridgeshire County Council / Peterborough City Council

Cambridgeshire and Peterborough Drought Damaged Roads

This project is a joint collaboration between the Councils to address the issue of drought damaged rural Fen roads. In March 2017, the Councils submitted a joint application to the DfT for Challenge Fund Tranche 2A funding to repair 65.61km of drought damaged fen roads. The Fenland area of suffers from failure caused by unstable or soft sub-soil. In order to get the best Value for Money from the funding provided by the DfT, a couple of innovative schemes were needed to address the issue of drought damage, both in repairing and maintaining the roads. The scheme provides the foundation for preventative long term asset management for the affected highway network and has minimised costly short term reactive repairs.

apse Innovation Awards 2018

Winner

Derbyshire County Council

Steering Derbyshire to top road ranking

Derbyshire County Council maintains almost 3,500 miles of roads and has 12 gangs for reactive maintenance across the county. The Council continues to face considerable service pressures – including the highway maintenance revenue budget being reduced by more than half over the last six years.

The state of Derbyshire's roads is vitally important to the Council's reputation. It consistently emerges as the hottest topic in resident surveys and across the authority's social media channels. Every year there are around 25,000 reports of potholes or other highways faults which need fixing. Prior to 2015 the Council was fighting a losing battle – both identifying and fixing potholes, and maintaining a positive image in the minds of residents.

Due to a complicated and inconsistent paper system, it was incredibly difficult to accurately say how many potholes there were or pinpoint their exact location without a paper chase. The team also had no real-time record of where gangs were working, and didn't have enough information to prioritise urgent jobs. In light of these problems, the Council embarked on the biggest ever overhaul of the way the highways team operates.

The previous asset management system was due for renewal – providing the perfect opportunity to launch a new project called Single Asset Management System (SAMS). The processes within the system were completely reviewed and re-engineered – with emphasis on the priority area of reactive maintenance.

The new system went live in November 2015 and it was game-changing. There is now an end-to-end electronic process, starting with a web form which automatically populates the system from a resident's report. Jobs are allocated by a scheduler and transferred to a gang via a mobile device. The new system generates robust, reliable data to monitor performance, based on real time information.

Roads workers have 'tough book' mobile devices which allows them to: access their daily schedule and record progress; photograph jobs before and after; and sign off jobs in real time, generating an email to the resident who has reported the fault.

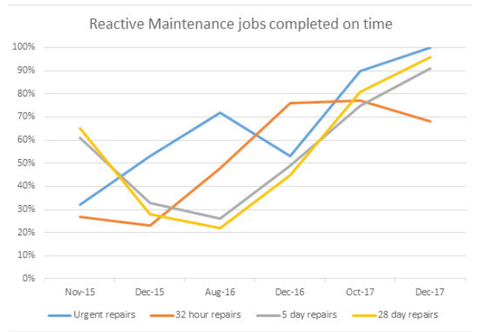
Another key factor was the creation of the Derbyshire Highways Hub, bringing together teams: responding to customer enquiries; processing works permits; handling insurance claims; co-ordinating roadworks; reactive maintenance scheduling; and temporary traffic management. There is now much closer working between schedulers and managers in charge of the road gangs. Regarding the positive outcomes of the scheme, records in the system are now robust enough to defend insurance claims, which have reduced by around 50% since 2013/14.

In 2017, the council surface dressed around 200 miles of road and invested an additional £6m to implement a coordinated, cyclical maintenance programme, where the focus is on prevention rather than cure. The wider use of Jetpatcher and 'hot box' technology also helped repair almost 38,000 potholes.

On-line reporting now enables people to pinpoint the exact location of defects and upload photographs and the telephone contact centre ensures callers are asked correct questions to generate required information. The new software provides automated updates to the person reporting a defect – from report to repair. The Team's communications ensure clear and consistent messaging – focussing on the authority's social media channels, which are now the first point of contact for most residents.

In November 2015 the team was still doing better on less urgent jobs than those where the need for repairs was more immediate. By August 2016 the systems and new working practices were becoming embedded and this trend turned around, with much higher performance for the most important jobs. By autumn 2017, the team was meeting the targets for urgent jobs – 100% on time.

Defects fell from 4,500 in July 2016 to less than 700 in December 2017 – a near 80% decrease which led to a wave of positive media coverage. The 2017 National Highways and Transport Network residents' satisfaction survey ranked Derbyshire top for highways and transportation services out of 31 county councils taking part



Winter Maintenance Innovation Award Finalists

Newcastle City Council

Winter Maintenance in Newcastle

Newcastle City Council is working collaboratively with Colas Ltd and Northumberland County Council to deliver an efficient, resilient winter maintenance service to the customers of Newcastle. The Council has established a steering group and developed a Relationship Management Plan in line with BS11000 Collaborative Business Relationship Management principles. This is based on the Council's combined accredited quality management systems and is a unique long term arrangement which is believed to be a first. It is hoped that this model could be an exemplar delivery model for other authorities to benefit from in the future. Through the implementation of this innovative contract it has allowed Newcastle City Council to further focus resources onto other areas of the winter maintenance services, such as footpath treatment, grit bin replenishment and key shopping areas around the city.

Ringway North Yorkshire

Enhanced Driver Training

In 2016 there was a serious incident on the North Yorkshire Highways Maintenance contract when a Gritting vehicle slid on ice, hit the verge and tipped over onto its side. Although shaken, the driver managed to raise the alarm via his "Skyguard" alerting the emergency services and his supervisor. A thorough investigation was undertaken which looked for the root causes and put actions in place to reduce the risk of similar instances. One of the recommendations was to improve the training given to staff carrying out Winter duties by introducing training on a low friction surface, replicating real life situations. Working with another supply chain partner, R3Rockingham, Ringway designed, developed and implemented a new approach to Winter Driver training. The new training led to a reduction in crash damage repairs for the 2017 season, a reduced risk of third party claims and an expectation of lower insurance premiums in the future. In 2018, there was a reduction of driver fault incidents involving winter vehicles.

Telford & Wrekin Council

Highways Incident Room

In preparation for winter 2017 and on the back of the lessons learnt from the water leak emergency, the Council developed a proposal for the 'Highways Incident Room'. The Highways Incident Room can be established for any emergency or planned event and provides a central control center for co-ordinating the Council's highways response to such an event. The main difference for the Highways Incident Room is the plan to utilise the Council's Urban Traffic Management Centre (UTMC) to co-ordinate such a response. The approach provided real time and instantaneous information to the public and allowed the highways team to respond to issues quickly. In terms of data this produced record levels of customer engagement with more than one million impressions from 8-15 December 2017 and a record level of 332,000 social media impression on 10 December 2017 alone. In addition, one of the Council's tweets was the 5th most viewed tweets out of all government related tweets

Winner

Wigan Council

Winter Maintenance Service Review

The review of the Council's winter maintenance service was initiated through the council's Highways 'Fresh-Look' service review process. This review provided the team with the opportunity to embrace new technology, increase the resilience of the service and the borough and to optimise the cost of delivering the service

Historically Wigan has deployed de-icing salt across the borough with 10 individual gritting routes. The routes broadly divide up the geographical area of the borough to ensure an efficient service. The creation of this plan is somewhat historical with new assets being added to the plan with little thought given to whether the gritting routes could be optimised or even reduced in number.

The team engaged a route optimisation consultant Webaspx, who analysed the network of highways and ascertained a more efficient gritting arrangement. One factor in the design of the new gritting routes was the permitted number of hours each of the vehicle drivers can work. The Working Time Directive limits drivers to 4 hours of driving work and applies to any planned gritting runs.

The analysis from Webaspx confirmed that the gritting routes could be reduced from 10 routes to 9 and this has been implemented.

Having established a reduction in the number of gritting routes from 10 to 9, the next area of investigation related to the most cost effective and efficient fleet procurement strategy that meets operational, financial and whole service requirements.

Four options were considered which ranged from retaining the existing fleet to leasing in a complete new fleet. Analysis determined that the best option was to change the whole fleet to a 'leased' fleet. This approach offered a significantly improved fleet reliability and reduced maintenance down time. The approach also provided modern vehicles for the operational staff with improved fuel efficiency and allowed on board IT control and accuracy to manage the rate of grit spreading.

Prior to the review, the Council used a 10mm rock salt to cover all its gritting requirements. However, an alternative 'coated' salt product was identified that could offer numerous advantages including cost savings. An analysis was therefore carried out of the use of coated salt to see whether this could be used in Wigan.

The analysis showed that whilst the Council would pay slightly more for the coated salt, it had the key quality of being a very good de-icing agent and other significant benefits such as: less volume needs to be spread - saving of around 30%; Rreduction in effects of corrosion by up to 82%; reduction in freeze-thaw carriageway damage; reduced environmental impact; and the removal of the need to wash gritters down each night.

After an initial investment cost of £35.5k (2016/17) the Council estimates a monetary saving of £334,432 over a three year period (2017-2020).

Currently Wigan has one weather forecasting station providing the Met Office with accurate weather forecast information and road surface temperatures for the network. This information is used to decide on whether to grit and which treatment is required. The system is updated every 20mins and enables managers to monitor actual temperatures against forecast temperatures.

In order to investigate route based forecasting, the Council has been working with Dr Simon Bell of Birmingham University and deployed five 'Wintersense' road temperature sensors over the 2016/17 winter season.

Following on from a successful trial which identified a theoretical potential saving of 205 tons of salt and 167 hours of operational time, the Team has now deployed an additional five sensors for the 2017/18 winter season. Each of the routes now have a sensor and the team continues to work with the university to develop the sensor technology with the aim of being able to have a robust route based winter maintenance service that will only deploy teams to individual route as/when the need arises.

Street Lighting Finalists

Derbyshire County Council

Pleasley By-Pass Street Lighting Scheme

There was a problem on the A617 Pleasley by-pass: a column corrosion on lighting in the centre reservation between crash barriers and cable network issues. The solution was to provide lighting, fit for purpose, without increasing lifecycle costs. In order to meet the design brief of replacing an existing archaic street lighting network with a full life cycle cost effective scheme, designed to improve highway illumination, pedestrian & traffic safety and column network distribution throughout the limits of the scheme, the designer had to think outside the normal parameters of conventional industry thinking. By challenging manufactures to provide a lantern that would illuminate four lanes from a single roadside, a highway street lighting scheme was devised that achieved estimated cost savings of between 45-55% of a typical double-sided scheme.

Milton Keynes Council

Can't buy it?.... We'll build it

Milton Keynes Council continues to drive for efficiency and improvement through a number of ambitious projects, to make public lighting more efficient and sustainable. Working creatively and collaboratively with partners to provide high quality LED lighting within challenging design constraints in high profile areas of Milton Keynes.

The solution to this particular challenge has resulted in delivering a modern technical lighting design, within a high profile heritage area, with a product that wasn't to be found on any supplier's product list. And when it comes to cost, the solution is less than 50% of the cost of conventional replacement components.

Via East Midlands Ltd (Nottinghamshire County Council)

Nottinghamshire Street Lighting Improvement Project

In 2012 Nottinghamshire County Council ended its maintenance agreement with 7 partner District Councils. Upon centralisation of the service it was quickly identified that there had been a vast difference in delivery of lighting functions throughout the County; each had run to different standards and specifications, using different materials. A total review of service delivery was essential.

Today the lighting teams are running efficiently and effectively with fully trained staff, ISO processes with standardisation of maintenance regimes and assets. Residents of Nottinghamshire now receive better value for money, benefitting from a heavily improved service, reduced energy bills and light outages.

Winner

Conwy County Council

Conwy Street Lighting Portal and Digital Transformation Project

Conwy are advocates of the importance of delivering asset management using innovation and new technology. Without a robust inventory of what we are responsible for, we are unable to deliver services effectively.

Street Lighting relies on innovative technology to maintain and deliver services. An historic bespoke Street Lighting System created many challenges for Conwy, leading to a service redesign and a rationalisation of IT systems.

This new technology included a real time customer interface Portal, feeding directly into the departmental asset management system. This was designed to allow customers to report faults at their convenience using a user-friendly web interface accessible 24 hours a day via PC, mobile or tablet.

The portal displays the location of each street lighting asset display themed by their status. This enables the public to automatically see whether a fault has already been reported online - the quicker a report is located, the quicker it is investigated and resolved.

The historic street lighting system presented many operational challenges and hindered service delivery. With no robust mapping system, a large percentage of the asset inventory was incorrectly referenced.

With an inventory in excess of 20,000 units, incomplete and inaccurate locations caused difficulty recording and identifying faults and service requests in the first instance. This impacted on both the general public and the internal work force.

No public interface or mobile technology resulted in reports and faults being reported manually by paper works ticket or verbal instruction. This slow, inefficient processes left Customers without updates and internal staff unable to track the progress of faults.

Electricians relied on narrative descriptions of faults, causing frequent miscommunication of incorrect information.

In 2013, a decision to remove the bespoke Street Lighting System and commission a data cleansing project was made. The existing Street Lighting Inventory was imported into the main asset management system where spatial analysis and asset attribute cleansing was undertaken.

Mobile technology was introduced enabling jobs, inspections and service requests to be recorded and completed in the field. All aspects of the street lighting assets' lifecycle could be captured including the plant, labour and material elements of every job.

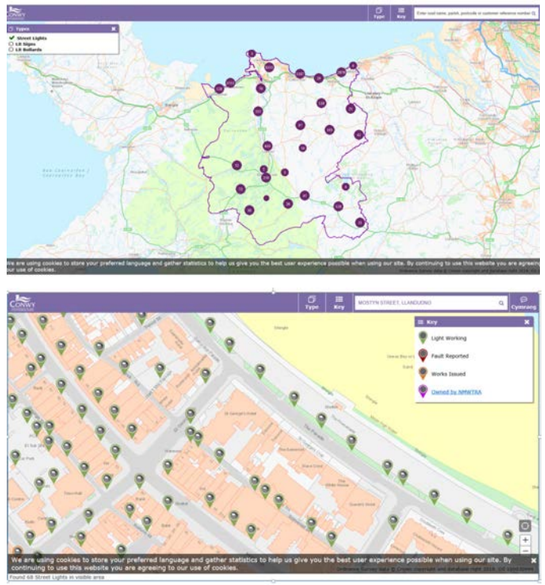
In 2016, confidence in the quality and accuracy of the street lighting inventory had grown. Therefore, a new customer service public interface was launched. The aim was to improve the overall customer experience, whilst maximising the use of technology and making data more accessible and transparent to the public.

The simple, user-friendly web interface is accessible online, via PC, mobile or tablet. Clicking on an asset opens a simple form for submitting reports and upload photos. The reports filter into the Asset Management System and are allocated to a supervisor via a tablet who raises and issues works direct to an electrician's tablet.

The portal allows users to select which asset is displayed: street lights, lit signs or lit bollards. All assets are displayed and colour themed by their current status (Green-Working, Red- Fault Reported, Amber-Works Issued). Users can zoom to a street, postcode or CS Reference Number to view and report a fault. Mobile device users can use the GPS Button to zoom into its current location on the map.

The main benefit is the transparency and ease of reporting. At every key stage of the requests' lifecycle, the customer remains informed and updated throughout. Upon logging the report, the customer receives an automated confirmation email and will continue to receive updates on progress through to completion. When the electrician completes a job on their tablet an automatic email is sent to the customer advising them that works have been completed.

Other positive outcomes include the fact that between 01/04/2018 and 22/01/2019, 1324 Street Lighting requests were recorded in Conwy. 47.2 % of these were using the new online portal. The percentage of street lamp failures repaired within five calendar days risen to 89.94% in 2017/2018 showing a 5% improvement. Finally, the average number of calendar days taken to repair street lamp failures during the year (KPI) has shown a significant improvement from 6.90 days (2013/14) to 2.30 days in (2017/18), demonstrating a remarkable improvement in service delivery.



Highways Maintenance Innovation Award Finalists

Darlington Borough Council

Roads for Residents

Darlington's transport strategy focuses investment on a hierarchy of maintain, manage and then improve our highway network; important during times of reduced resources. To support and drive growth in the economy the principal road network has seen most investment. However, declining public satisfaction and robust inspection data identified a problem with a rapidly declining unclassified road network. A multi strand proactive programme was put into action to target additional resources in residential areas. Based on 'spend every pound wisely', it aims to reduce the negative impact of pot holes; minimise disruption to traffic and residents; and uplift the public realm.

Dorset County Council

Dorset Highways Development Programme

With reduced training budgets, there wasn't a clear development route for Highways staff to progress. At no additional cost, in-house staff created and ran an 18-month staff development programme, open to all staff, consisting of online and classroom training, shadowing opportunities and mentoring.

We reviewed recruitment and current staffing to highlight probable gaps in the future. A Succession Planning Framework and Statement was produced.

At the end of the programme, 85% of candidates had either been promoted, given additional responsibilities or seconded to new roles. They had greater understanding of the work that Highways and the council delivered.

Oxford City Council/Oxfordshire County Council/Oxford Direct Services

Dorset Highways Development Programme

The partnership between Oxfordshire County Council, Oxford City Council and Oxford Direct Services is a tripartite collaboration that is delivering improved highway maintenance services and better outcomes for the users of the city's busy and historic road network. Underpinned by strong political backing and an enduring commitment to reducing bureaucracy and non-value-adding activities, the partners are jointly focused on delivering real value where it matters, on the ground. The innovative arrangement, established over a number of years, is a highly productive and efficient way of delivering customer-focused services and continues to evolve, embracing a broadening range of services and opportunities.

Tameside Metropolitan Borough Council

Reducing health risks in highway work

Tameside MBC is totally committed to the health, safety and welfare of their highway operatives and is constantly looking at new ways to improve operational working.

The purchase of our three Multihog machines has totally revolutionised the way we undertake highway repairs ultimately ensuring that, every day, our operatives go home healthy.

The use of our Multihog machine has reduced manual handling tasks by 85% and has shown a significant reduction in noise, hand arm vibration and respirable crystalline silica dust as well a decrease in sickness absence reporting caused by MSD's.

Wigan Council

East Lancashire Road (A580) Planned Maintenance

This submission highlights the benefits that can be obtained via innovative contractor partnering.

The East Lancashire Road (A580) is one of the councils principal high speed highways and is a crucial East/West link between Manchester and Liverpool which is fundamental in promoting commerce within Greater Manchester and the wider North West region.

During the summer of 2018 Wigan committed to carrying out 21,000m2 of carriageway resurfacing.

Through innovative working with our contractor (Tarmac Limited) we were able to complete an extended resurfacing scheme (29,000m2) within budget, whilst reducing the lane occupancy from 10 to 4 evenings.

Winner

Durham County Council

The Plastic Roads Project

The Council's maintenance backlog is projected to increase over time, as current funding levels are not sufficient to maintain the highway in a steady state condition. The Council therefore needed to identify new ways of sustaining highway maintenance with lower funding.

As well as highways maintenance, the team is also responsible for waste management.

The current international waste recycling market has been thrown into flux, since China stopped accepting waste from other countries for sorting, recycling and disposal.

This has caused significant difficulties and cost pressures for UK waste management authorities, as they have to find new and alternative outlets for sorting and disposing of plastic waste.

How did the team innovate to overcome the problem?

Durham's road surfacing contractor, Rainton Construction sourced plastic from MacRebur Limited, which has developed a process for incorporating waste packaging and insulation into asphalt.

The process allows waste plastics, which previously would have been disposed, to be engineered and blended to provide an additive to asphalt, replacing and reducing the amount of fossil fuel bitumen required.

The product works with existing asphalt production equipment and installation processes, avoiding the need for new capital investment.

The engineered waste plastic pellets come from a variety of sources including single-use plastics, plastic bags, insulation materials etc.

The project offered the prospect of helping the Council reduce its bitumen costs in road resurfacing and providing an outlet for single-use plastics that otherwise would have been landfilled or incinerated.

In order to test the viability and suitability of the product for road resurfacing, two trials were undertaken, at Sedgefield, and then at Murton.

At the time in 2018, the Sedgefield A689 scheme was the largest plastic roads trial in the UK. The scheme used 6.5 tonnes of plastic equivalent to 60,000 plastic shopping bags – as part of a sustainable and cost effective approach to re-using difficult-to-recycle materials.

Using plastic in road resurfacing has offered a number of benefits and outcomes. The scheme has:

- Created an outlet for single-use plastics that otherwise would be landfilled or incinerated.
- Reduced waste disposal costs.
- Meant that less bitumen is required in asphalt by substituting with plastic waste.
- Lowered bitumen costs.
- Reduced carbon emissions.
- Increased elasticity for roundabouts.
- Led to fewer potholes and other defects.
- Improved safety.
- Reduced in CO_2 emissions by offsetting the need to dispose of plastics.
- Reduced overall volume of CO_2 emitted into the atmosphere.

apse Innovation Awards 2019

Winter Maintenance Innovation Award Finalists

Ayrshire Roads Alliance

Partnership working (Winter Resilience Scheme)

Engaging with, and developing local community volunteer groups to enable them to undertake footway gritting activities when experiencing periods of inclement winter weather, and in particular, empowering them to provide much needed assistance to vulnerable residents within their local areas where required.

With over 270 volunteers now actively involved in our winter resilience scheme, this partnership working arrangement has led to a significant improvement in the Ayrshire Roads Alliance's ability to carry out additional footway gritting operations in areas that we would not be able to get to so easily, when experiencing such challenging winter conditions.

Durham County Council

Durham County Council Winter Service

Keeping things moving in England's snowiest county is a top priority for Durham County Council. Our Winter Service Policy and Operational Plan are updated each year and we treat 45% of the highway network to ensure the safe and convenient movement of people and goods. Our ongoing investment and improvement programme work towards the key objectives of customer safety, serviceability and sustainability, and with continued fleet investment coupled with advances in leading technology, we have seen a 10 percentage point increase in customer satisfaction in this high profile and important public service.

East Riding of Yorkshire Council

Gritting vehicle naming campaign

Following our busiest winter for five years, the Winter Team launched a low-cost publicity and education campaign to raise the profile of our service and raise awareness of the work we do.

Inspired by an idea sent to us by a five-year-old boy, we asked residents to suggest names for our 21 gritting lorries. This created a buzz on social media and in the local press.

We held a launch event to reveal the chosen names, which resulted in valuable positive publicity for the team, leading to a drop in complaints and a rise in positive feedback the following winter.

Renfrewshire Council

Winter Maintenance in Renfrewshire

Severe winters and a challenging financial environment has led to Renfrewshire reviewing its winter maintenance service. A new approach has been achieved by bringing together trained staff from StreetScene and Roads services to work flexibly to deliver a 24/7 service. The changes have been supported by an innovative communications and marketing strategy and further enhanced by promoting accessible self-service resources for local communities. The overall impact has seen improved public perception in the service and overall service efficiency savings in terms of overtime, fuel consumption and salt usage.

Winner

Northumberland County Council

Improving Winter Services in Northumberland

Northumberland is a unique and diverse county with a large rural area and five climatic zones presenting different problems. 50.9% of our population live in 3.3% of the urban south east and 5000 km plus of roads (97.7%) are classed as rural.

This brings complications to the delivery of winter services, and getting the message out to local residents, workers and visitors was challenging, The Council knew it needed to look for new ways of working.

The age profile of the gritting fleet was increasing, and the Council wanted to look to generate income to help offset future savings.

How did the team innovate to overcome the problem?

The team realised it couldn't tackle the problems by one method only so developed a three point approach focussing on:

1. A communications review
2. Acquisition of a multi -purpose fleet
3. Income generation combined with partnership development

The communication strategy around winter awareness included an information leaflet (updated annually) to inform the public about what the team does and why they do it. This goes to all NCC and Parish Councillors to distribute, with supplies in key places such as info points, libraries and doctors surgeries.

The updated website now features a number of YouTube videos showing all aspects of winter services, filmed in depots, on local roads and featuring the Council's own workforce. The Team took traffic police out on normal gritting runs to get first hand experience of conditions - part of the ongoing strong partner working with the police force.

The fleet replacement programme allowed the Council to invest in multi-purpose vehicles. The team used Quick Change Bodies which enabled them to use the vehicle chassis all year round on various activities, not just winter services. The team also introduced innovative technological changes in the vehicles such as 360 degree external cameras, visible in both the cab and remotely from a supervisor, thus improving all round safety.

When it came to income generation, the Council developed a partnership with Colas to deliver winter services for an adjacent authority - Newcastle City Council. Northumberland staff provide the management decision; making for treatment across both local authority areas which has proved financially beneficial and gives a cohesive approach to treatment across bordering authorities.

The Council's YouTube video has received in excess of 43k views and the NCC alerts page has13.5k followers. Current trends show the number of complaints has decreased.

The £2m investment in 13 new vehicles has improved the age profile and significantly reduced the need for intervention, maintenance costs and downtime.

Street Lighting Finalists

Conwy County Borough Council

Street Lighting Data Improvement & Interface Project

Last year, Conwy transformed their Street Lighting Service, significantly improving the way in which public services are managed and delivered.

This year, Conwy have continued to work hard and progress with implementing new technology to innovatively manage their assets and services.

A redesign of service processes has resulted in the implementation of a new schedule of rates that is linked directly to mobile inventory asset updates. A new direct interface with the Welsh Government Asset Management system has provided improvements in KPI's, minimised administration time and further enhanced service delivery.

Lancashire County Council

Woodend Road Lighting improvements

We received a complaint from Councillor Carol Johnson that the area was suffering from a surprising amount of anti-social behaviour, given its` 'rural' location. The anti-social behaviour took the form of fly tipping, alleged drug taking and dealing and also frequent visits by Prostitutes with their clients. Councillor Johnson pointed out that since the lighting had been out, the ant-social behaviour had started.

We looked at restoring the lighting. As reconnecting the original supply was not an option, we looked into the option of connecting a new mains: however connecting to the nearest mains was neither realistic nor affordable.

apse Innovation Awards 2020

At the same time we were talking to 'ZETA specialist lighting' about LED replacement. We got talking about Woodend Road and ZETA suggested they could quote for a fully solar powered system.

The installation of the lighting and also the boulders on the pavement have totally removed the ant-social behavior that was taking place. The fly tipping has also stopped and we can say with confidence that the work has had a positive impact on the area and the community.

Telford & Wrekin Council

Making the street-lighting network green

In April 2017 the Council embarked on a 2 year £5.4million project to upgrade over 20,000 street lights, 2,000 road signs, and over 500 bollards in the Borough to LED lanterns. This involved working in partnership with contractor Prysmian to upgrade and a communications and engagement campaign with residents to ensure they understood the importance of the upgrade and had the opportunity to feedback their opinions .

Upon completion of the project the Council has seen energy consumption fall by 60% compared to pre-project levels and CO2 emissions have reduced by 75% across the Borough, further helping the Council to save money and to help meet its target of being carbon-neutral by 2030.

Wigan Council

Street Lighting Innovation LED to Brighter Future

This review of the Wigan Council street lighting service was initiated through the council's efficiency agenda and street lighting 'Fresh-Look' service review process. This review provided us with the opportunity to embrace innovative LED technology, increase the resilience of the service and our borough, optimise the cost of delivering the service, reducing the environmental impact and energy consumption. The main outcomes from the review were: optimised lighting levels to meet British Standards, significantly reduced energy consumption, a more environmentally friendly and sustainable service, and smart technology to manage and control each street light to give the right light, right place, right time.

Winner

Via East Midlands Ltd (Nottinghamshire County Council)

Nottinghamshire - Lighting the Way to Save Energy

Nottinghamshire County Council ended the maintenance agreements with its 7 partner District Councils and brought the street lighting service back in house. This included stock of 94,000 streetlights & 13,000 illuminated signs.

Little investment had gone into the service prior to handover and the range of equipment was vast so keeping spares of everything was expensive. The first year was spent chasing from fault to fault to keep the lights on. By October the budget for the year was exhausted and instruction was given to prioritise critical repairs only. This was unsatisfactory during the darkest months of the year.

Energy costs were increasing heavily and outages had reached an all-time high, with ever aging equipment and budgets being cut significant change was needed. It became essential to re-establish a robust maintenance schedule back across the County.

LED's were entering the market, but it was still very early days and there were no additional budgets to pay for lanterns. Alternative funding sources were explored, and Salix were soon identified as a possible partner. Salix offer interest free loans for energy saving projects, but Street lighting bids had never been considered because of the 5-year payback.

Initially a bid was put forward to change 10,000 lanterns to LED, this was so successful that a further bid was presented to introduce a 4-year programme of LED lanterns changes. The payback was there due to the inefficiency of the SOX lanterns so these were targeted first.

A maintenance replacement directive was agreed and circulated to give operatives some guidelines to work with, training programmes were established, and routes drawn up and issued to change SOX lanterns to LED.

Each wattage of lantern was colour coded with a sticker on the box and on the underside of the lantern. This assisted the storeman to stock lanterns correctly and inspectors to check the right lantern was installed on site. This method has since been rolled out to other Councils.

Over 65,000 LED lanterns have now been installed in Nottinghamshire with works on-going. Funding achieved from Salix is just over £12m with energy savings of over £7.5m to date. The project has been at no extra cost to the authority as this money would have been spent on the energy bills.

Energy & Carbon targets have been smashed with reductions of 17,500,000 kwh & 15,300 tonnes of carbon pa since the start of the project. There has been a 47% reduction in faults resulting in an improved street lighting service and value for money for the residents or Nottinghamshire.

Knowledge on how to gain funding through Salix was shared with other local authorities to help them to establish similar programmes and Salix are now inundated with requests for street lighting projects

From July 2016 all highways functions were transferred to Via East Midlands Ltd, a local authority owned company. This created a further opportunity to improve service provided with the introduction of performance indicators & service credits. The next stage is to bring connection works in-house and provide a one stop shop services for NCC.

Highways Maintenance Innovation Award Finalists

Cumbria County Borough Council

BridgeCat

BridgeCat is a world-first vehicle built to inspect flood-damaged bridges, which could see communities affected by heavy rainfall reconnected more quickly. It uses sonar and an underwater camera to provide detailed information about bridges, which could have sustained damage. Developed by Cumbria County Council's in-house Bridges and Structures team, this technology will allow bridges to be re-opened more quickly, improve flooding resilience and help prevent isolation between rural areas. The council were instrumental in realising there was a need to find a solution and approached the DfT to seek additional funds to undertake a trial which has had positive success.

ODS Group

The Journey to Zero

With a climate emergency declared and in preparation for a world leading Zero Emissions Zone, we are supporting the installation of various Electric Vehicle Charging points in Oxford to ensure our infrastructure supports policy.

The partnership between Oxford City Council, Oxfordshire County Council, Oxford University's Transport Studies Unit and ourselves, is a quadripartite collaboration delivering Electric Vehicle Charging solutions for the users of the city's busy and historic road network.

Underpinned by strong political backing and a joint commitment, the partners are jointly focused on delivering practical solutions on the ground, supported by research to inform future product selection.

Oxfordshire County Council

Gullysmart Project

The key to providing efficient and effective services, at County level, often depends on the capacity to share knowledge, information and data across multiple stakeholders and, thereby, ensure that each stakeholder prioritises decisions and undertakes activity based on current and accurate information and within the scope of their responsibilities.

The innovative approach by Oxfordshire CC and KaarbonTech transformed our capacity to share multiple data sources, real time information and obtain significant financial savings through an asset management platform that could be shared and accessed across all stakeholders, engaged in the management of the drainage network and flood risk reduction.

Staffordshire County Council

Gully Analytics

Since 2014, Staffordshire County Council (SCC) and Amey have been working in partnership to manage and maintain the county's highways infrastructure. We identified that gully cleansing was an area that could benefit from efficiency improvements. By moving to a single software system accessible via mobile devices we are able to more accurately map asset location and record issues with gullies. This data has led to the creation of a risk-based cleansing regime which has led to an 18% decrease in total workstack, improving overall network condition and supporting higher levels of customer satisfaction.

Innovation Awards 2020

Winner

Wigan Council

Injecting Innovation into Bridges

This report outlines Wigans approach over the last 12 months using new materials/techniques in the maintenance of its highway bridges.

Increasing traffic levels, vehicle weights, carbon dioxide, sulphates, sulphuric acid and chloride ions from de-icing salts all contribute to the deterioration of bridge infrastructure.

The waterproofing of bridge decks is recognised as a vital planned maintenance activity and prevents some of these effects in damaging critical elements of the bridge; to ensure its durability; and ensures the lifecycle of the structure is achieved and often extended, as with these brick arch bridges.

Traditional methods of carrying out these works causes major, costly diversions and disruption to highway users, due to the need to excavate the whole of the carriageway and footway on the bridge to reach the full area of the bridge deck that needs to be re-waterproofed.

Previous National Highways & Transportation Network (NHT) customer satisfaction surveys highlighted highway user dissatisfaction due to experiencing delays to their journeys on the borough's highway network. The Greater Manchester Congestion Deal also gave a commitment to reduce the number and/or duration of streets works that were taking place across the conurbation and to use/be better at adopting innovative ideas and making use of new techniques.

Through extensive market research and engagement with specialist manufacturers and contractors our maintenance teams evaluated alternative techniques that would reduce or eliminate the need for highway restrictions.

The team identified a new and innovative way to undertake waterproofing of bridges by injection, which would remove the need for excavation. It was quickly recognised, that if successful, this approach would be transformative in the way that these schemes are undertaken and the first time they have been used in the North West.

Using our Highway Asset Management approach and Life Cycle Plan, five masonry arch structures were identified to trial this new method of working.

As these bridges spanned natural water courses, the Environment Agency were consulted on our proposals, which included the use of a new inert material, MC-Injekt GL-95. The EA supported this approach as the inert properties of the material would remove dangers of spillage and contamination of watercourse. As such the works were approved without the need for a permit. Appendix 1 shows photographs of the works on site.

In order to evaluate and understand the potential benefits of using this innovative approach, a base line was produced that estimated the cost to undertake the works as £5m using traditional methods. The value of the trial using the new innovative approach was around £337.5k. This was a significant financial saving.

Other significant environmental benefits that were identified and assessed including:

- Avoidance of excavating/ disposing of 2,576m3 of waste material;
- Avoidance of importing and re-instating 2,576m3 of new aggregate and bitumous carriageway and footway materials;
- Avoidance of 483 lorry movements and carbon emissions in material transportation;
- Avoidance of lane and road closures;
- Avoidance of carbon emissions associated with vehicles following diversions and idling traffic waiting for traffic lights;
- Avoidance of cost/ delays to public transport, fleet businesses and commuters following diversions and idling traffic waiting for traffic lights.
- Duration of the works reduced from forecast 52 weeks to 18 weeks.

Winter Maintenance Innovation Award Finalists

Ayrshire Roads Alliance

Community Winter Resilience

Engaging with, and developing local community volunteer groups to enable them to undertake footway gritting activities when experiencing periods of inclement winter weather, and in particular, empowering them to provide much needed assistance to vulnerable residents within their local areas where required.

With over 400 volunteers now actively involved in our winter resilience scheme, this partnership working arrangement has led to a significant improvement in the Ayrshire Roads Alliance's ability to carry out additional footway gritting operations in areas that we would not be able to get to so easily, when experiencing such challenging winter conditions.

Cumbria County Council

Winter Service Review

Cumbria County Council are current responsible for the maintenance of over 7,300 kms of Highway in Cumbria, of which 2,300 kms are current treated on a full winter treatment using 29 gritters in 9 depots. The Winter Service Review (WSR) is a full 'Root and branch' review of this service taking into account the £240 plus million savings today with a further £31 million to find in the next 5 years. WSR reviews the whole service in line with Well Managed Highways.

East Riding of Yorkshire Council

Brine Production Farm

In order to facilitate default pre-wet treatment delivery, the East Riding of Yorkshire Council has made significant investment to improve brine production facilities across it's 4 winter service depots. This has resulted in significant financial operational savings and has built a resilience for the storage of brine to undertake around 12 consecutive treatments when salting at 21gm2, should there be a malfunction or breakdown with the brine production units or interruptions in the salt resupply chain. Covered salt storage facilities have also been purpose build for the white marine salt which is used for producing the brine.

Glasgow City Council

Winter Gritting Story Map

After the 'Beast from the East' one of the lessons learned was resident gritting information should be more relevant, easier to understand and accessible. A highly visual, interactive on line Winter Gritting Story Map (WGSM) was developed. The WGSM: is easy to navigate; uses colourful imaging; has intuitive GIS interactive mapping to assist journey planning and to locate grit bins and includes self-help tips for residents, cyclists and drivers.

Lancashire County Council

Lancashire County Council's Decision to Lower its Winter Treatment Intervention Level from +1.0C to +0.5C

Lancashire County Council lowered its winter treatment intervention level from +1.0C to +0.5C. This was considered to be a more appropriate level due to advances in route based forecasting, excellent salt storage facilities, a relatively new and well maintained fleet, all decision makers and supervisors being fully trained. Decision makers considered that treatment was taking place when there was relatively little risk and the service was challenged to review how it undertook all its services. Over the last winter this has resulted in 312 fewer route treatments and generated a saving of over £82,000.

Winner

Kent County Council

Wintersense RST Sensors

Since 2013, Kent County Council (KCC) has contracted with Amey plc to deliver highways maintenance services on its behalf. We have developed a strong collaborative relationship, working together to continually improve the network.

In 2017, after a challenging winter season, we identified the need to optimise service delivery to ensure we meet demand during prolonged periods of ice and snow; particularly as such events may become more frequent due to climate change. KCC has a fleet of 64 vehicles to grit 2,586km across 58 'primary routes' (around 30% of roads in Kent). In severe conditions we may also salt 'secondary routes' (a further 15% of the network).

Following a successful trial of Road Surface Temperature (RST) sensors on Amey's highways contract in Hampshire, a business case was created for installing these in Kent to support a data-driven approach to winter service. We secured investment through the Kent Lane Rental Highway Innovation Fund. Between 2017 and 2018, we installed 120 RST sensors across Kent. They are attached to existing street lighting columns and traffic signal poles and have now been collecting data across two winter service periods.

The Wintersense RST sensors were developed at the University of Birmingham. The devices use infrared to read road surface temperature, and connect via SigFox's 0G wireless network to report data in real-time. The data is combined with information from seven Vaisala weather stations and from weather forecaster MetDesk in relation to air temperature, wind speed and direction, precipitation and humidity.

At the end of the 2017/2018 winter season, the project team, including data scientists, produced a report validating weather forecasts against gritting decisions. It showed that, although forecasts were reliable in showing which areas would experience freezing temperatures, 45% of gritting was unnecessary as the RST sensors showed surfaces along many treated roads did not actually reach freezing. The established practice of gritting all available routes based on forecasting alone, without location-specific, real-time data, led to an unnecessary spend of around £129,000 (based on cost of salt, vehicles and operatives).

The team has developed a model that predicts surface temperatures on any given road 24 hours ahead of gritting with over 90% accuracy by combining RST sensor data with location-specific features and historic weather information. The model's outputs showed potential for significant savings in salt and resource requirements while maintaining safety.

We used the new data to redefine the seven 'weather domains' across Kent. These geographic areas were previously based on less precise thermal mapping data. We re-mapped the domains by identifying roads that exhibit similar surface temperature patterns, enabling us to pinpoint where to send resources in cold conditions.

Currently, we are digitally mapping the 58 gritting routes, informing auto-salting of the road surface. All completed gritting routes have been uploaded into the GPS navigation system onboard the vehicles, and are achieving precise route-based treatment application through technology that automatically applies salt to specific road lengths.

The remaining routes are due to be mapped in early 2020. Once this is complete, we will further refine routes by overlaying updated domain boundaries to create whole, optimised routes within domains – ensuring the most efficient use of vehicles when gritting is needed.

By reviewing RST readings along defined gritting routes, our winter team can now make decisions based on real-time data that informs them precisely where and when surface treatments are needed. Based on the analysis of the 2017/18 winter service period, we predict savings of around £109,000 a year by avoiding unnecessary gritting – allowing KCC to make best use of its resources.

The targeted approach to gritting also supports road safety. By using optimised routes and automatic salt application based on real-time data, we will minimise the risk of leaving potential danger spots untreated due to inaccurate forecasting or human error. By reducing 'over gritting' of road surfaces that do not reach freezing, and designing routes to reduce miles driven, we are also cutting the overall carbon footprint of the service.

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