PUBLIC

HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT STRATEGY AND PLAN

JUNE 2018

AN ELEMENT OF THE HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT SYSTEM

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TABLE OF DEFINITIONS	
TERM	**DEFINITION**
ADEPT	Association of Directors of Environment, Economy, Planning and Transport
AMX	Asset Management eXpert for Bridges and Structures
BOATs	Byways Open to All Traffic
BSCI av	Bridge Structural Condition Indicator Average
BSCI crit	Bridge Structural Condition Indicator Critical Element
CMS	Central Management System
DCC	Derbyshire County Council
DLO	Direct Service Organisation
DNO	Distributor Network Operators
DMS	Data Management Strategy
FCI	Footway Condition Index
HARRP	Highway Asset Review and Reduction Programme
HMEP	Highways Management Efficiency Programme
LED	Light Emitting Diode
MHA	Midland Highways Alliance
MSIG	Midlands Service Improvement Group
PCI	Pavement Condition Index
RUPPs	Road Used as a Public Path
UTMC	Urban Traffic Management and Control
VRS	Vehicle Restraint System

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FOREWORD

The highway network is used every day by the residents and businesses of Derbyshire, together with the many visitors that visit our beautiful County, and as such is fundamental to all economic and social activity in Derbyshire. This Highways Infrastructure Asset Management Strategy and Plan sets out the Council's overarching approach for managing the highway infrastructure asset, ensuring that asset management principles are embedded to ensure a safe and reliable network. Our highways teams are committed to managing our highway infrastructure assets for the benefit of all of our users and we look forward to working closely with all stakeholders to take this strategy and plan forward.

Mike Ashworth

Strategic Director of

Economy, Transport and Environment

Cllr Simon Spencer

Cabinet Member for

Highways, Transport and Infrastructure

INTRODUCTION

The Importance of Derbyshire's Highway Infrastructure

Derbyshire's highway infrastructure supports private, public and business transport needs in a diverse environment, from the heights of the Dark Peak to the lower levels surrounding the River Derwent.

Highway infrastructure is the largest and most visible asset the Derbyshire County Council (DCC) is responsible for and it is fundamental to the delivery of the Council Plan. It includes over 5,000km of road network, as well as supporting public transport through cycle routes, public right of ways, canals, bus stations and shelters, on-street parking, school buses and vehicle fleet. It reflects the character and quality of the local areas that it serves and makes an important contribution to the wider Council priorities, including regeneration, social inclusion, education, employment, recreation and health. In order to deliver these aims and strengthen local communities, it is crucial that it is maintained to enable safe, reliable and sustainable journeys.

The Case for Asset Management

Asset management has been widely accepted by Central and Local Government as a means to deliver a more efficient and effective approach to the management of highway infrastructure assets through the longer term planning and the optimal allocation of resources. It enables DCC to manage risk and meet performance requirements in the most efficient and sustainable manner.

DCC has been implementing good Asset Management practices over a number of years. This Strategy document builds on that work and will outline how Highway Infrastructure Asset Management will be achieved. It follows a review of the previous strategy document and replaces the previous Highway and Transport Asset Management Plans and the Strategy produced in 2015. It will enable the Council to continually review its approach, develop its asset management practices for its integrated highway network and where necessary, identify and quantify efficiency improvements.

Derbyshire's approach to Asset Management has been developed using the recommendations made within the 2013 Highways Management Efficiency Programme (HMEP) Highway Infrastructure Asset Management Guidance and is the basis of the Council's approach to delivering best practice, as set out in the 2016 Code of Practice for Well-Managed Highway Infrastructure. These require local authorities to adopt a risk based, integrated asset management approach to maintaining highway infrastructure by October 2018. These approaches are supported by the new funding models for local authority highway maintenance.

HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT FRAMEWORK

Highway Infrastructure Asset Management Framework in Derbyshire

The Highway Infrastructure Asset Management Framework identifies the activities and processes that are necessary to develop, document, implement and continually improve asset management. It highlights the relationships between asset management, national and local factors and dependencies that influence the ability to deliver these services and support continual improvement in highway infrastructure asset management. An Asset

Management Strategy Framework has been produced based on good practice guidelines and this is shown in the figure below:

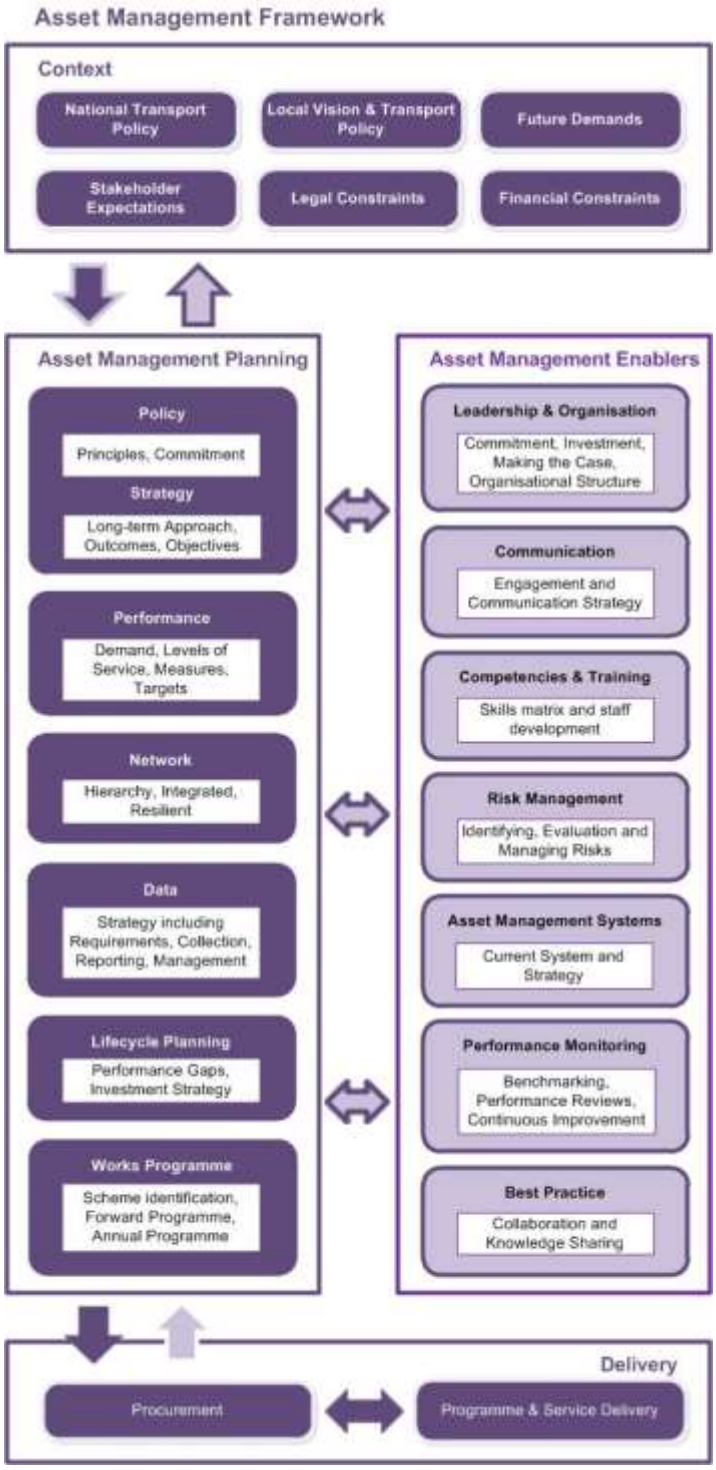

Figure 1: Asset Management Framework

CONTEXT

This establishes the context for highway infrastructure asset management which includes a variety of factors that need to be taken into consideration when determining the Council's expectations for the highway service.

Key Drivers for Highway Infrastructure Asset Management

- Meeting national policy, guidance and codes of practice
- Delivering Council goals – including maintenance policy and Local Transport Plan
- Supporting Council Vision
- Complying with legal duties, including Highways Act 1980, Traffic Management Act 2004 and The Equalities Act 2010
- Enabling effective whole Government accounts and local financial reporting
- Managing Stakeholder expectations – DCC readily engages with stakeholders through Elected Members, the National Transport and Public Satisfaction Survey, the DCC website, officer workshops and Midland Service Improvement Group (MSIG).
- Understanding future demands of the highway infrastructure assets
- Making the best of financially constrained budgets
- Delivering efficiency and value for money
- Delivering long term improvements to the condition of the network
- Providing a safe and reliable network

The delivery of good practice embedded highways infrastructure asset management, aligns with ISO 55000 – the international standard for asset management. It is not the intention of the Council to seek accreditation at this time, however, this will be evaluated as a development opportunity in future reviews of this strategy.

HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT PLANNING

These are the key activities that are undertaken as part of the asset management planning process.

The Asset Management Policy, Strategy and Highway Infrastructure Asset Management Plans provide a clear line of sight from the local and national policies that shape the future direction of the DCC to the delivery of highway services. Figure 2 overleaf illustrates the key documents within the process and their links within the wider context of national and council policies.

Highway Infrastructure Asset Management Policy

The Highway Infrastructure Asset Management Policy is a high level document that endorses the County Council's commitment to highway infrastructure asset management and demonstrates how this approach aligns with the Council Plan. It is set out in the Highway Infrastructure Asset Management Policy and follows a review of the previous 2015 policy.

Highway Infrastructure Asset Management Strategy

The Highway Infrastructure Asset Management Strategy outlines how the Highway Infrastructure Asset Management Policy will be delivered and how it is informed by the adoption of the Highway Infrastructure Asset Management Framework.

Highway Infrastructure Asset Management Plan

The Highway Infrastructure Asset Management Plan states how the Policy and Strategy will be delivered. This public explanation document provides the strategic overview to the Highway Infrastructure Asset Management Plan and sets out the overall Highway Infrastructure Asset Management Strategy and Framework and the aims and objectives for each of the main asset groups. These groups include: highways structures, traffic management and management of electronic traffic equipment, street lighting, street furniture and drainage and is public facing and available on the DCC's website.

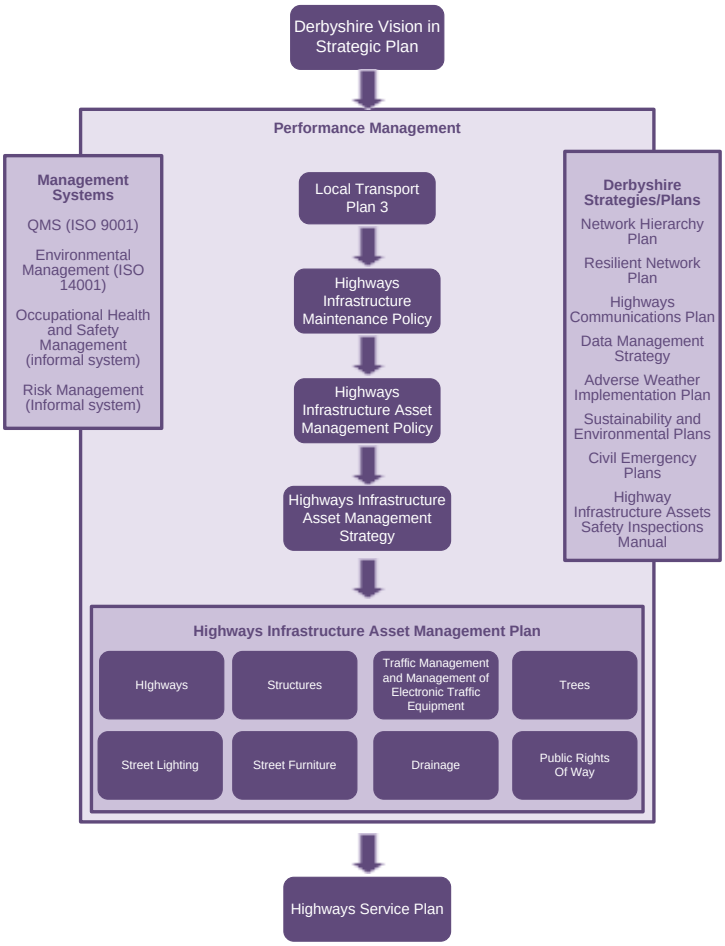

Figure 2: Key Documents and Context

Performance

The demands placed on the highway network will change over time and consequently place greater or lesser pressures on highway infrastructure assets. Levels of Service are a simple and effective way of describing the service that is to be delivered by the Highway Authority. These can identify the way it is to be measured in a way that helps stakeholders understand what can be expected. It is therefore necessary to set Levels of Service to specify the standard of service that is to be delivered.

These Levels of Service must take into consideration statutory duties, national and regional guidance, the management and mitigation of risk both to the service user and DCC and the volume and type of traffic using the network.

Whilst Levels of Service for highway maintenance are primarily determined by the Council's statutory obligations as a Local Highway Authority, to mitigate risk to those using their network, the promotion of core corporate objectives of safety, serviceability and sustainability are also key determining elements. The requirement to provide a safe and reliable network in relation to its use underpins service standards namely; what, when and how highway maintenance is delivered. The overarching Levels of Service are shown in the table below:

Table 1: Levels of Service

Key Principle	Aim	Level of Service
Network Safety	Ensure that all highway assets are in a safe condition whilst reducing road traffic casualties	Complying with statutory obligations
		Meeting users' needs for safety
Network Serviceability	To manage the current network condition and improve where possible and required to meet Derbyshire County Council's service objectives	Ensuring availability
		Achieving integrity
		Maintaining reliability
		Resilience
		Managing condition
Network Sustainability	To ensure the cost of maintaining and operating the highway network over time, whilst supporting improvements to the environment and local communities	Minimising cost over time
		Maximising value to the community
		Maximising environmental contribution
		Maximising long-term availability
Customer Service	To deliver best value and locally focused solutions	Communication, consultation, levels of service, information

Network Hierarchies

The purpose of a Network Hierarchy is to recognise that the failure of certain routes or items of infrastructure would have a greater impact on the economy and communities than others. It is used as a tool to help ensure that highway maintenance activities are effectively prioritised. The Network Hierarchy is user defined, based on usage and not dependent on the current road classification system. The Network Hierarchy can be found in the document entitled Network Hierarchy Plan.

Critical assets have been identified for each main category of asset. These are assets where failure would result in significant impact to the local economy. A Resilient Network has been developed which will have the highest priority and contains the critical assets identified for each main category of asset, this can be found in the document entitled Resilient Network Plan.

Data

Good asset management relies on accurate, appropriate and current data in order to inform successful asset data management based decision making. It is therefore important to

collect the appropriate data, maintain it in an effective system and ensure its accuracy and currency through regular audit and update processes.

A Data Management Strategy (DMS) has been developed that outlines the management of current and required data using a risk based approach and identifies business need, data owner, accessibility and date stamping, data collection, frequency of collection and updating, data management and disposing of data.

Lifecycle Planning

In line with current national guidance and good practice, Derbyshire is using a simplified network based approach to life-cycling but developing a more section based lifecycle approach to managing its carriageway, footway and structures maintenance activities. Considering how long specific maintenance treatments last, the relative cost of treatments and the levels of service to be provided are essential pre-requisites to good asset management.

A key component is maximising the life of an asset whilst minimising the budget and resource implications. The asset lifecycle plans consider the whole life costs using and the investment required to maintain the asset over the long term, i.e. 15 – 20 years for most highway assets. However, this will be over a much longer term for Highway Structures, dependent on the nature of the structure.

This approach enables planned maintenance to be carried out on the network at the right time in order to achieve value for money, delivering the agreed Levels of Service and achieving the performance monitoring objectives, providing opportunities for continuous improvement.

Derbyshire has also developed a systematic approach to assessing if assets are still appropriate and required, or whether they should be decommissioned. This is being done through the Highway Asset Review and Reduction Programme (HARRP), focusing initially on road traffic signs but to be extended to all assets, where appropriate.

Works Programme

By developing financial models associated with lifecycle planning, this Strategy will enable a 1 – 3, 5, 10 and 15 year forward works ‘strategic’ budget to be identified for all transport assets.

It will also provide clear indications as to the nature of planned maintenance required to maintain the network, as a whole, by considering asset condition and lifecycle costs against the provision of the desired levels of service, and ultimately, deliver the budget and works programme.

The Forward Works Plan is currently focused on the Carriageway Asset Group, with a developing Footways and Structures Programme. Street lighting is subject to a Light Emitting Diode (LED) replacement programme and other assets are being captured and surveyed to be incorporated over time. The Forward Works Plan will provide a work bank that can be prioritised in the Highways Service Plan within the available budget.

The Forward Works Plan will show the collective works backlog, it shall make clear what level of funding is required to reduce the backlog and provide the agreed Levels of Service, thus making a better case for additional funding to maintain this vital asset.

The prioritisation of the schemes identified within the forward programme will be determined annually by available budget, condition and risk through a Programme Development Board

and consultation with Elected Members, and these will be the basis of the Annual Highway Maintenance Service Plan.

HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT ENABLERS

The Highway Infrastructure Asset Management Enablers are the supporting activities that support the implementation of the Asset Management Framework.

Leadership and Organisation

This document emphasises the importance for an asset management approach and the Council's commitment is shown in the statement contained in the Foreword to this document.

Additionally, the leadership has embedded asset management within the job descriptions of the following key positions within the Economy, Transport and Environment Department, Highways Division, making them all responsible for asset management and defining the asset owners:

Service Director of Highways
Head of Highways Strategy
Head of Network Planning
Head of Construction Design
Head of Construction Services
Principal Engineer – Traffic and Safety
Principal Engineer – Highways Maintenance
Senior Project Engineer – Structures Maintenance
Senior Project Engineer – Traffic Signals
Senior Project Engineer – Street Lighting

It is their responsibility as the asset owners, to implement the Highway Infrastructure Asset Management Policy, Strategy and Plan with support from the Head of Highways Strategy. Presentations have been made to Elected Members and staff regarding the case for asset management ensuring that all staff understand and are on board with the asset management approach.

A gap analysis has been undertaken to establish where improvements can be made, action plans have been developed to improve and embed asset management principles into day to day processes.

Communication

For an effective Asset Management approach to be seen as successful, it needs to be communicated clearly and prescriptively through the correct channels to ensure engagement at both strategic and local levels. Asset Management principles and methodologies will only be successful if key decision makers, such as Elected Members and those making use of the service/network, are on board and are able to visualise the long term benefits and savings to be made from this approach.

DCC's overarching Communication Policy and Stakeholder Engagement Plan is held within the Communications Division, however, the Highways Division has an individual communications and stakeholder engagement document entitled Highways Communications Plan.

DCC participates and utilises the information in the National Highways and Transport Public Satisfaction Survey to measure the public's satisfaction with the functions of the transport network and what elements are of greatest importance to them. This information helps to inform our service priorities and communications approach.

DCC have also piloted Pop Up Surveys in the community to gauge customer viewpoints. It is planned to roll this out as part of the overall engagement approach.

Competencies and Training

Competency, skills and training are identified in the Workforce Development Plan for both individuals and disciplines which is under development. Part of this framework is a skills matrix for key staff involved with the asset management process to ensure that staff have the required competency. Any training requirements are identified and prioritised through the annual Corporate MY Plan process.

Risk Management

Risk Management requires a less prescriptive approach to asset assessment and allows decisions to be made using risk assessments on the needs and local variation to meet the demands of highway infrastructure asset management which are outlined in the context section of the Asset Management Framework. To ensure that users' reasonable expectations for consistency are taken into account, the approach of and, in particular, adjoining other local highway authorities has been considered.

The purpose of a risk based approach is the consistent application of a decision making process to:

1. Correctly evaluate the risk posed to highway users by all defects or deficiencies in the highway asset
2. Prioritise resources so that the risk is managed effectively
3. Ensure the efficient use of available resources
4. Understand performance and address any gaps in resources or performance
5. Ensure value for money
6. Enable monitoring of outcomes

All outcomes and targets are subject to change due to unforeseen circumstances, for example, global pandemic.

Asset Management Systems

Data appertaining to the highway network and its Asset Register is held in the Single Asset Management System "Confirm", a Pitney Bowes product used by many local councils to manage highway and transport assets, customer services, maintenance and performance.

Apex systems are used to manage and monitor performance across the Highways Division, Economy, Transport and Environment Department and the Council.

Performance Monitoring

An Asset Management Performance Management Framework is being developed. Progress will be continually reviewed against this Framework and formal annual reviews will be undertaken. Performance will be monitored to identify where progress is being made and where changes are needed to ensure the asset is managed in the most efficient manner, and to ensure that there is continuous improvement.

Data is supplied annually to the National Highways and Transportation Survey which serves to provide details on levels of customer satisfaction with local authority services and practices. This helps target and publish information clearly and effectively to ensure members of the public and other highway stakeholders are as fully informed as possible about the current performance of our services. It drives our performance, identifying public perceived gaps, helps us analyse the public's understanding and will inform our communications approach.

This Strategy and our Highway Infrastructure Asset Management Policy will be reviewed annually and updated and re-published as appropriate.

Best Practice – Collaboration and Knowledge Sharing

The MSIG is a forum for adjacent/peer authorities to share knowledge and good practice. Derbyshire was one of the founding members and remains active in leading in innovation. Many of Derbyshire's processes that ensure the implementation of this Strategy, have been developed in conjunction with other local authorities within the MSIG.

DELIVERY

This section sets out how Highway Maintenance Services will be delivered.

The delivery of the on the ground Highway Maintenance Service is undertaken predominately by Construction Services, the "in-house contractor"

Additionally, procurement frameworks are in place, such as the Midland Highway Alliance (MHA) for services. It allows for prudent procurement of goods and services, and helps with achieving economies of scale for both of these, plus supply contract management. This was the first partnership of its kind in the UK which commenced in July 2007. The MHA delivers the regional procurement and implementation of highways maintenance, professional services and capital works through framework agreements.

HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT PLAN FOR THE MAIN ASSET GROUPS

General

This section summarises the existing highway assets, their current condition and a summary of the Maintenance Strategy to be employed for each main asset group in the future. Although these strategies are stated individually for each asset type, they have been considered as part of the overarching integrated network. It states the overall aim, short term, medium term and long term desired outcomes, identifies the risk in not meeting these, and the identified funding gaps required to manage the asset.

HIGHWAYS INCLUDING FOOTWAYS, CYCLEWAYS, PUBLIC RIGHTS OF WAY (PRoW) AND HIGHWAY TREES

Carriageway

The carriageway is the most valuable asset, receiving the greatest level of maintenance expenditure with a Gross Replacement Cost of £5,997 billion. There is a total of 5,449 km of carriageway with 484 km on the resilient network and 4,965 km on the non-resilient network.

Carriageways were the first asset for which lifecycle plans were developed resulting in the creation of several investment scenarios which have modelled current condition, investment levels and desired performance outcomes. This has enabled a greater understanding of where to target investments to achieve the desired Levels of Service. Historically, the condition of the asset was measured through scanner, scrim and deflectograph surveys. The scanner survey reported the carriageway condition through a road condition index. In 2016, the survey method was changed to an Annual Engineers Inspection which gathers the surface condition through a treatments option list and reports the carriageway condition through a Pavement Condition Index (PCI). This shows that the percentage of roads reported as “Need Maintenance Now” for resurfacing/reconstruction/surface dressing/micro asphalt is 11.5% for principal roads, 10.0% for non-principal roads, and 18.5% for unclassified roads. This is then combined with the scrim and deflectograph survey data along with engineering judgement and the lifecycle planning process to prioritise the sites that require maintenance.

Planned maintenance is delivered by an annual programme which is capital funded. The risk based asset management approach has been endorsed by Elected Members and £7.946 million of funding was been committed for the period 2019-2020. This funding is linked to defined performance outcomes that are measured and reported annually.

Management of potholes and other carriageway safety issues arising across the network is delivered using revenue funding and this has reduced significantly over the last decade. However, the revenue budget is expected to continue to be under severe pressure over the coming years. Using sound asset management principles and improving the coordination of road maintenance activity, we will continue to increase the value achieved in road maintenance, improve network resilience and reduce the burden on revenue budgets through the delivery of effective programmes of preventative work.

Overall Aim: To put in place a strategy delivering best value for money prioritised according to the network hierarchy.

Short-term desired outcome (1 to 2 years): To provide a rolling 5 year programme and deliver the current annual programme of works as efficiently and effectively as possible by using the right treatment at the right time to gain the optimum value for money.

Medium-term desired outcome (3 to 10 years): To embed lifecycle principles and support funding challenge bids to target investment in the road network. To further develop the right treatment, right time and prioritisation processes to ensure all resources are employed to deliver the best value for money.

Long-term desired outcome (11 to 20 years): Continue to use good asset management principles to inform and support funding of carriageway maintenance. To maintain and implement programmes of work delivering best value against the overall aim.

Identified Funding Gaps: to provide innovative treatment choices and extend the lifecycle of the carriageway network.

Footways and Cycleways

Footways and cycleways support access and mobility and encourage alternatives to the car, particularly for journeys in urban areas. Well maintained footways aid social inclusion, particularly improving accessibility for vulnerable people. It has a Gross Replacement Cost of £390.2 million.

There are 324 km of cycleways and greenways and in excess of 4,500 km of footway. The annual maintenance expenditure for 2019 -2020 was £3.178 million and this made up nearly 21.66% of the available highway maintenance budget.

Footway condition has historically been assessed through a detailed visual inspection survey and reported the best value performance indicator for the footway. In 2018-19 the survey method changed to the Annual Engineers Inspection which will report a Footway Condition Index (FCI). Due to the survey transitional period we are not able to report the current condition of the footways and cycleways. Therefore our ability to model a capital programme and lifecycle plan for our footways asset is limited for these reasons, but is being developed.

Overall Aim: The Council has a preventative strategy to improve the condition of the most-used footways. We will maintain other footways in a 'steady state'. We will assess rural/lesser-used footways to determine whether to maintain or allow to become rural paths and utilise surface treatments to prolong lifespan.

Short term desired outcome (1 to 2 years): Review and finalise the footway and cycleway hierarchies

Medium term desired outcome (3 to 10 years): Implement the new Annual Engineers Inspection to derive the FCI and then develop lifecycle planning and forward prioritised works programme.

Long term desired outcome (11 to 20 years): Through the continuation of good asset management principles, continue to inform and produce cases for the funding of footway/cycleway maintenance in Derbyshire and to maintain and implement programmes of work delivering best value against Council and Highway Service objectives.

Identified Funding Gaps: Improving our information for future investment and further bids.

Public rights of way

Public Rights of Way (PRoW) are part of the highway network. They provide opportunities to improve the health and wellbeing of the public as well as linking communities and services throughout the county. The network includes the following elements: Public Footpaths, Public Bridleways, Restricted Byways and Byways Open to All Traffic (BOATs). The County Council is responsible for the maintenance of the majority of PRoW (a small number are privately maintainable) in addition to maintaining signposts and other assets within the surface of the PRoW. NB Gates as stiles are the responsibility of the owner of the landowner.

There are 4,496 km of footpaths, 610 km of bridleways, 67 km of restricted byways and 59 km of BOATs. Approximately, 29% of these are contained within the Peak District National Park.

DCC currently inspect Rights of Way on a reactive basis only.

Overall Aim: We will continue to provide our service in line with our Rights of Way Charter and the Rights of Way Improvement Plan for Derbyshire.

Short term desired outcome (1 to 2 years): To support the update of the Rights of Way Improvement Plan (ROWIP) and incorporate the public rights of way network within the Highway Infrastructure Asset Management Plan. The ROWIP is a statutory document that DCC must publish and refresh on a 10 year cycle and it will influence the management of the PRoW network and HIAM. The risk of not creating a HIAM is that we would not have a record of how we manage our assets.

Medium term desired outcome (3 to 10 years): To develop a proactive inspection regime for Public Rights of Way. The risk of not doing this could lead to an increase in insurance claims, failure in respect of the pursuance of the Council's statutory duties, reduced access to the countryside, local facilities and a potentially negative effect on the visitor economy.

Long term desired outcome (11 to 20 years): To maintain the inspection regime and ensure public rights of way remain usable and passable. The risk of not doing this could lead to an increase in insurance claims, failure in respect of the pursuance of the Council's statutory duties, reduced access to the countryside, local facilities and a potentially negative effect on the visitor economy.

Identified Funding Gaps: The following projects have been identified which require additional funding:

- Update of the Definitive Map and Statement (Statutory Duty).
- Signposting off the carriageway to complete backlog and the progress to managing within the Council Asset Management System as ongoing work programme to maintain the assets.
- Increasing revenue funding to enable the maintenance of the network.
- Annual investment programme for degraded routes across the County to improve accessibility.
- Enhanced Service Level Agreement with the Peak District National Park Authority.
- Revision of Parish Council Minor Maintenance Scheme providing incentive funding for work on the network.
- Contingency funding in response to annual survey of network.

Highway Trees

The Highway Act places a duty on Derbyshire to ensure that trees they own and those under private ownership adjacent to the highway do not pose a danger to the public. DCC are currently unable to specify specific tree amounts until a full inventory is completed.

Tree inspections are currently reactive only and carried out by tree inspectors with input from Highway Inspectors if required.

Overall Aim: To develop an inventory of Derbyshire Highway Trees and to develop a management plan to sustain the future of Derbyshire's tree population.

Short term desired outcome (1 to 2 years): To gather a full inventory of Derbyshire Highway Trees. To develop an Ash Dieback Management Plan.

Medium term desired outcome (3 to 10 years): To develop a forward and annual programme for the management of Highway trees. To manage the Ash Dieback Plan.

Long term desired outcome (11 to 20 years): To maintain the highway tree inventory and to carry out the forward and annual programme.

Identified Funding Gaps: The following projects have been identified which require additional funding:

- Ash Dieback Management Plan
- Building the inspector competency to assist in tree inspections

STRUCTURES

DCC actively manages its structural assets in accordance with the principles set out in the UK Roads Liaison Group publication “The Management of Highway Structures, A Code of Practice”.

There are approximately 230 bridges, 116.8 km of retaining walls, 28 landslips, 57 rockfaces and 1 gantry on the resilient road network with a Gross Replacement Cost of £332,707,850 for bridges, £212.2 million for retaining walls and £120,431 for gantries. The remaining road network has approximately 952 bridges, 1,193 km of retaining walls, 180 landslips, 18 rockfaces and 3 gantries with a Gross Replacement Cost of £552,721,028 for bridges, £1.54 billion for retaining walls and £370,238 for gantries.

The condition of the structures asset is measured primarily by two factors, Bridge Structure Condition Indicator Average (BSCI av) and Bridge Structure Condition Indicator Critical Element (BSCI crit) which are derived from general bridge and principal bridge inspections. In accordance with the national recognised indicators published by Association of Directors of Environment, Economy, Planning and Transport (ADEPT) and in common with most local authorities, there has been a slow reduction in the overall stock value which at present in Derbyshire, is within the range denoted ‘fair’. Out of this stock, 77 structures are rated below this level. This information is stored within Asset Management eXpert for Bridges and Structures (AMX), a bespoke database used to determine lifecycle planning strategies for structures.

All structures are maintained in a condition that is ‘safe to use and fit for purpose’. If safety critical components are identified as being deficient after inspections, immediate steps are taken to make them safe. At present, substandard structures are monitored to determine their structural performance and are managed in accordance with the code of practice.

Overall Aim: To ensure the highway structure stock is safe to use and fit for purpose. Asset management principles are used for prioritising maintenance spend. The Council will arrest progressive deterioration and deliver sustainable improvement in overall condition, subject to increased funding. The Council will put in place a preventative strategy, delivering best value for money, prioritised according to the Network Hierarchy.

Short term desired outcome (1 to 2 years): The asset management lifecycle plans show that 1 bridge on the Resilient Network will have life expired in the next 3 years. These will be replaced or repaired to avoid failure. The risk of not achieving this would be either loss of network or significant network restrictions.

Medium term desired outcome (3 to 10 years): To avoid the Resilient Network structures from being classified as poor condition, ie a BSCI av of below 65%. The risk of not achieving this would reduce the robustness of the Resilient Network and impose increased financial liabilities on DCC.

Long term desired outcome (11 to 20 years): To increase the BSCI av score network wide on both the resilient and non-resilient network.

Identified Funding Gaps: The following projects have been identified which require additional funding:

- Preventative retaining wall strengthening/repair/replacement
- Identify major maintenance schemes with values in excess of £1 million

- Increase resilience for the structures stock to resist climate change (flooding) on at risk structures

DRAINAGE

The Council's highway drainage asset is critical to ensuring the controlled removal of water from the carriageway to allow customers to use it safely. The impact that failure of the drainage asset can have on other highway infrastructure is significant, particularly on the carriageway.

The current inventory of highway drainage assets across Derbyshire includes approximately 19,202 gullies and 30 culverts on the Resilient Network and 146,375 gullies and 247 culverts on the non-resilient network. We are continuing to improve the information for grips and drainage ditches.

These gully drainage assets are all proactively maintained through intelligent cyclic maintenance with a risk based approach. Outside of this maintenance, the current approach to repairs and improvements is predominately reactive. Information regarding these gully assets is comprehensive, however, only partial information regarding where they discharge to is available and this can be divided into locations where the information is either known, assumed or unknown.

To proactively maintain the entire drainage asset into the future, we will continue to build a complete inventory and good understanding of condition, including the associated risks that come with failure. This will enable us to undertake programmes of preventative maintenance whilst monitoring and reviewing performance.

Improving our knowledge of drainage infrastructure across the County will enable us to demonstrate evidence-based decision on drainage maintenance and support our ability to secure future funding investment, whilst demonstrating savings in revenue expenditure through efficient and effective maintenance.

Overall Aim: The Council will improve data collection to enable better management of assets and invest in positive drainage systems which prevent flooding and protect carriageways.

Approach: To continue proactive cyclic maintenance of known drainage assets (gullies, grips and ditches) in accordance with industry guidance. To continue to collect inventory and condition information for the remaining unknown drainage assets to enable clear lifecycle plans to be developed, and a proactive approach for future programmes of prioritised maintenance to be achieved. The risk of not achieving this is increased damaged to highways infrastructure due to flooding and increased financial liabilities on the DCC.

STREET LIGHTING

Street lighting is an important highway asset, contributing to public amenity, safety and the night time economy. There are 89,805 road lighting columns with a Gross Replacement Cost of approximately £82,600,500. However, in addition to street lighting columns, there are 1,430 pole mounted street lighting brackets with 537 of those in Electricity North West area, 756 cast iron street lights, 1,610 illuminated bollards, 299 refuge beacons, 4,126 illuminated signs, 963 sign plate attachments (for example double aspect signs) 857 illuminated bus shelters and 339 subway lighting units.

The overall condition of the street lighting is monitored in accordance with “Institution of Lighting Professionals guidance note GN22/19 Asset-Management Toolkit: Minor Structures” with a target to maintain the number of columns in excess of the action age at less than 50%.

After consulting with residents, 7,289 street lights were converted to operate on a part night switching regime between June 2012 and July 2015. This has saved £84,000 in energy costs. DCC is currently converting all street lighting columns to LED technology at a cost of approximately £9 million for the Resilient Network and £23 million for the non-resilient network. This conversion, along with dimming some lights, will reduce the energy consumption to approximately 16 million kWh. As part of this process, each column is inspected for its structural and electrical condition, and assessed for its ability to be converted or its requirement to be replaced.

Overall Aim: To reduce energy consumption and maintenance requirements by dimming and installing LED lights. To reduce progressive deterioration and deliver sustainable improvement in overall condition in lighting columns across both the resilient and non-resilient network. To develop a programme of structural testing of lighting columns that are over 8m in height or more. To reduce the number of Destination Network Operators (DNO) pole mounted street lighting equipment. To eliminate redundant signage and bollards that are un-necessarily lit and improve asset condition using an audit. To remove 230V supplied from central refuges. To create a smart parking meter asset that can be remotely monitored and managed, providing data on revenue income and parking occupancy at sites across the County. To improve asset inventory for subway lighting units and convert to LED technology.

Short-term desired outcome (1 to 2 years): To continue with the programme to convert assets to LED technology and replace columns where deterioration is present on both the resilient and non-resilient network by April 2022. To update the asset inventory and condition to reflect the current situation for parking meters. To provide a condition survey for signs and identify and devise a prioritised programme to remove illuminated signs that are either redundant or where illumination is not a requirement. Where illumination is required, ensure lights are utilising LED technology. To provide a condition survey and update inventory for subway lighting units including information such as manufacturer of the unit and to also devise an asset replacement programme to convert to LED technology. To investigate feasibility to integrate into street lighting CMS (when available) and use dynamic switching in subway lighting (increase illumination when people are detected) to further reduce energy consumption.

The risk of not achieving is increased energy costs, increased maintenance costs of failed low pressure sodium lamps which are no longer in production, and collapse of columns showing signs of deterioration/corrosion.

Medium term desired outcome (3 to 10 years): To replace columns identified as high priority under the Asset Management Plan on both the resilient and non-resilient network which, if not completed, have a risk of collapse. To replace the cable network identified in poor condition on the non-resilient network which, if not completed, has the risk of electrical faults. Commence the Asset Replacement Programme and installation of LED technology for signs and subways. Monitor the asset condition for parking meters and identify a replacement programme.

Long term desired outcome (11 to 20 years): A continuation of the replacement of columns and cable network. A replacement of the LED drivers and luminaires as necessary on both the resilient and non-resilient network. To maintain cast iron lighting columns. Monitor asset condition and replace assets identified in Asset Management Plan for signs, subways and parking meters.

Identified Funding Gaps: The following projects have been identified which require additional funding in both the medium and long term:

- Reduction in pole mounted street lighting brackets on Electricity North West apparatus approximately 537 units
- Refurbishment of approximately 756 cast iron lighting columns and conversion to LED

TRAFFIC MANAGEMENT AND MANAGEMENT OF ELECTRONIC TRAFFIC EQUIPMENT

Traffic Signals

Traffic signal controlled junctions and pedestrian crossings form an important highway asset, contributing to the safe and efficient use of the road network, promoting economic growth within the County, promoting walking and cycling and improving accessibility. Its efficient operation and maintenance allows those using the road network to move around the County with the minimum of delay and disruption. Efficient maintenance regimes also ensure that the traffic signal installations are maintained in a safe structural and electrical condition.

Currently, there are 437 signal installations which include 131 signalised junctions, 7 pelican crossings, 267 puffin crossings, 25 toucan crossings, 7 Pegasus/equestrian crossings and 118 zebra crossings. There are 176 permanent electronic warning signs, 67 mobile electronic warning signs and 440 flashing amber warning lights outside schools. The Gross Replacement Cost for these assets is £15 million. A programme is currently being undertaken to replace all pelican crossings as the pelican technology is becoming obsolete.

Each assets condition is inspected twice annually and is tested for electrical safety every 5 years, however, additional inspections may also be carried out at the discretion of the highway authority for various reasons such as after a road traffic collision or complaints from members of the public regarding the operation of the site. Evaluation and prioritisation of refurbishment works is based on the condition surveys included in the periodic inspection regime together with officer assessment, lifecycle planning and the knowledge of future works.

Overall Aim: We will focus on priority junctions and signal controlled crossings in need of replacement using LED/low voltage technology. We will review the need for signals in some locations in line with agreed criteria.

Short-term desired outcome (1 to 2 years): To complete the prioritised refurbishment programme of 16 signalised junctions plus convert the remaining pelican crossings to puffin crossings. The risk of not achieving this would be potential age related signal failure which may affect the safe and efficient use of the highway network.

To implement Urban Traffic and Management Control (UTMC) in Chesterfield including the back office communications systems and remote monitoring of assets, whilst also assessing the potential of expanding the scope to other areas of Derbyshire. The risk of not achieving this could result in higher levels of congestion which may affect the safe and efficient use of the network.

To upgrade approximately 10 zebra crossing sites to Halo type equipment. The risk of not doing so may lead to reduced safety of vulnerable users due to corrosion of existing equipment impacting on driver awareness.

Medium-term desired outcome (3 to 10 years): Upgrade the existing asset stock of school safety zone flashing amber warning lights, plus implement a review of all current electronic warning signs installed with a view to replace or remove depending on development and impact of in-car information systems. The risk of not achieving this could result in obsolete or unnecessary equipment still in situ.

Implement a robust refurbishment schedule associated with potential for unsupported maintenance of obsolete signal controllers or associated equipment. The risk of not doing so

may result in the failure of signal equipment and having no access to spares to carry out a repair.

Long-term desired outcome (11 to 20 years): To implement the ongoing programme to replace and refurbish in order to meet the lifecycle plans for each asset type.

Identified Funding Gaps: The following project has been identified which requires additional funding in both the medium and long term:

- Replace all flashing amber warning lights providing UTMC connectivity

Non Signals Electronic Traffic Assets

Non signals electronic traffic assets include road safety assets, customer support assets and assets which support the future planning of highways works.

Currently, there are 136 real time passenger information assets, 67 fixed road safety camera housing units, 42 car parking metres, 8 miovision cameras, 44 traffic monitoring SDR units, 4 speed guns, 158 Automatic Traffic Counters, 40 passive bluetooth journey time monitoring devices and 7 weather stations.

Development Area 1: Gross Replacement Cost

The Gross Replacement Cost will be calculated once the quality processes for installing new traffic monitoring sites is instigated.

Real time passenger information assets are inspected reactively. Speed cameras and weather stations are condition inspected annually by an external company. Car Parking Metres are currently inspected by district and borough councils. Traffic monitoring equipment assets are inspected on a rolling basis and also have regular condition testing.

Overall Aim: To bring in the management of the majority of these assets to one single asset management system entirely under the control of Derbyshire.

Short-term desired outcome (1 to 2 years): To bring the management of traffic monitoring equipment into one single asset management system. The risk of not undertaking this task is that work will continue in disparate siloed systems which are updated sporadically and not always in line with the most current data that in turn can lead to data currency issues. To procure an external provider to undertake semi-permanent traffic surveys. The risk of not procuring this service is that we will have a limited amount of staff that can undertake this process which makes it hard to schedule and provide up-to-date skills training. There is also the added risk associated with working in the highway that this work requires.

To improve information held on speed cameras. To instigate the DHART CCTV project. To introduce rising bollards into our asset inventory. To bring car parking metres in house.

Medium-term desired outcome (3 to 10 years): To maintain the asset inventory and to develop lifecycle plans and inspection regimes for new assets. The risk of not undertaking this process is that we will not understand where our assets are and what condition they are in or are likely to be in. This can have impact on under budgeting for their upkeep/replacement as well as prevent us from effectively bidding for investment from central government or other funding streams. Operationally a lack of asset information always leaves us in a reactive rather than proactive state which can increase costs and rely on the public to report faults to us.

To upgrade traffic monitoring at weak bridges to provide evidence to support the management of critical infrastructure and the resilient network.

To replace all car parking metres within Derbyshire in the next 5 years.

Long-term desired outcome (11 to 20 years): To maintain lifecycle plans, inspection regimes and asset inventory for all assets. The risk of not undertaking this process is that we will not understand our assets and what condition they are in or are likely to be in.

Identified Funding Gaps: The following project has been identified which requires additional funding in both the medium and long term:

- Updating the district data sets for highway functions.

STREET FURNITURE

A well designed and managed highway environment generates benefits for residents, businesses and visitors to the County. Street furniture has a significant presence within this environment and appropriate design and maintenance of these assets is required to offer a safe and attractive public realm to road users. Street Furniture has a Gross Replacement Cost of approximately £16.5 million. Street Furniture can be sub-divided into safety street furniture which includes safety fencing and vehicle restraint systems, pedestrian barrier/restraint system, traffic signs, traffic calming and anti-skid surfacing and those miscellaneous items of street furniture, such as benches, grit bins and tree grates/grills. For the purpose of this Plan, the safety street furniture elements are discussed below.

Many of the elements of street furniture has historically been maintained by routine and reactive means with the last comprehensive asset inventory being collected in 2009.

Safety Fencing and Vehicle Restraint Systems (VRS)

There are 43 km of VRS on the Resilient Network and 68 km on the non-resilient network. Other VRS are still likely to be identified through routine inspections.

Overall Aim: We will maintain assets that are fit for purpose and reduce rate of decline in condition. We will invest in reactive maintenance following accident damage and then recover costs from 3rd parties.

The current approach to repairs and improvements is predominantly reactive. To proactively maintain the asset into the future, we will continue to build a complete inventory and good understanding of condition, including the associated risks that come with failure. This will enable us to undertake assessment and to prioritise programmes of preventative maintenance, whilst monitoring and reviewing performance.

Short term desired outcome (1 to 2 years): Carry out a condition survey and asset survey on the Resilient Network and formalise an action plan of repair/replacement.

Medium term desired outcome (3 to 10 years): Review and update the VRS Risk identification process to determine priorities for maintenance and inspection. Complete the assessments, lifecycle planning and identify repairs to VRS on the Resilient Network and attract the necessary funding to carry out these repairs. Survey all non-resilient network and assess. This will ensure that all VRS assets will be mapped on a base plan with coded condition assessment. This will consider asset reduction principles.

Long-term desired outcome (11 to 20 years): Prepare plan of action to ensure all VRS are assessed, routine inspections undertaken and plan formulated to bring all VRS up to current standards.

Identified Funding Gaps: submit bids to support resilient network programmes.

Pedestrian Barrier/Restraint System

Pedestrian restraint systems have been provided as a traffic management solution predominately where there has been a safety concern identified, to prevent immediate incursion into the carriageway outside locations, such as schools whose gates directly join the highway or as an effective means of channelling people to cross or access a specific point on the highway. There are 659 locations of pedestrian guardrail on the Resilient Network, and 1,748 locations on the non-resilient network.

There are no condition surveys undertaken, however, they are included in the highway infrastructure asset safety inspections. The current approach to repairs and improvements is predominately reactive with an assessment undertaken by the Traffic and Safety Team to establish if there is still a requirement for its presence. Any new requests for installations are reviewed on an individual basis.

Overall Aim: To maintain pedestrian barrier/restraint systems that are fit for purpose.

Approach: We will continue to react to issues identified on the network by assessing if it is still required and repairing or removing as necessary.

Traffic Signs

Signs are provided to alert drivers to potential danger, give effect to a mandatory or prohibitory manoeuvre or provide directional or other information for drivers to improve safety, prevent obstruction and ease traffic flow. There are approximately 14,955 traffic signs on the Resilient Network and approximately 62,029 traffic signs on the non-resilient network.

There are no condition surveys undertaken, however, they are included in the highway infrastructure asset safety inspections. The current approach to repairs and improvements is predominately reactive with an assessment undertaken by the Traffic and Safety Team to establish if there is still a requirement for its presence. Any new requests for installations are reviewed on an individual basis. Additionally, the HARRP programme has developed a systematic approach to assessing if the assets are still appropriate and required, or whether they should be decommissioned.

Overall Aim: We will focus on areas of the network with significant changes or increased risk levels. We will review the need for signs at some locations to improve effectiveness and reduce environmental impact.

Short term desired outcome (1 to 2 years): Update asset inventory to reflect the current situation. It is anticipated that there should be a reduction in assets on the network following various de-cluttering initiatives since the database was last updated.

Medium-term and long term desired outcome (3 to 20 years): To ensure proper use of signs to maintain their effectiveness whilst minimising their impact on the environment throughout the network. This will improve the streetscape at the same time as improving the information provided to motorists and reduce future maintenance costs.

Approach: Continue to operate a reactive approach primarily based on routine highway inspections. It is considered that this provides the most cost-effective method of sign maintenance and enables a consistent approach to reviewing the need for the asset on an individual basis in line with DCC's Road Signs: Environmental Code of Practice.

High Friction or Anti-skid Surfacing

Anti-Skid surfacing reduces the risk of skidding for vehicles, reduces vehicular breaking distance and is particularly relevant in wet conditions. It is also resistant to materials, such as oil, fuel, and solvents, ensuring that it maintains the anti-kid qualities despite accidental spillages. It is generally used for a variety of locations, at pedestrian (zebra, puffin, pelican, toucan and pegasus) crossing approaches, traffic signal junctions and roundabout approaches, severe bends and cycle lanes.

To proactively maintain the asset into the future, we will continue to build a complete inventory and good understanding of condition, including the associated risks that come with failure. This will enable us to undertake assessment and programmes of preventative maintenance, whilst monitoring and reviewing performance.

Overall Aim: To maintain anti-skid surfacing where its provision remains a safety benefit on the network.

Short term desired outcomes (1 to 2 years): Update asset inventory to reflect the current situation and assess to establish if it is still required.

Medium to long term desired outcomes (3 to 20 years): Develop a prioritised programme of preventative maintenance for anti-skid surfacing. To develop a case for funding the maintenance of anti-skid surfacing in Derbyshire and to implement programmes of work delivering best value against Council and Highway Service objectives.

Approach: Using inventory data, develop a site specific lifecycle model for anti-skid surfacing and implement a programme of preventative maintenance. This programme will consider all existing maintenance of anti-skid surfacing and propose a plan offering a coordinated, best value approach in the future. In addition, the inventory data will be used in association with collision data to ensure that existing anti-skid surfacing is appropriate and continues to perform in terms of casualty reduction.

Identified Funding Gaps: Submit bids to support prioritised network programmes.

Traffic Calming

Traffic Calming features are provided as a means of reducing the impact of traffic on the highway and the immediate environment. They generally have the effect of reducing or regulating traffic speeds, discouraging traffic usage or providing a higher degree of priority for vulnerable road users by using an innovative combination of vertical and horizontal deflections, signage and road markings.

New requests are assessed through our Speed Management Protocol Engineering Technical Annex, used to categorise all engineering measures available and to identify the circumstances where such measures will and will not be used.

There are no condition surveys undertaken, however, they are included in the Highway Infrastructure Asset Safety Inspections. The current approach to repairs and improvements is predominately reactive.

To proactively maintain the asset into the future, we will continue to build a complete inventory and good understanding of condition, including the associated risks that come with failure. This will enable us to undertake assessment and programmes of preventative maintenance, whilst monitoring and reviewing performance.

Overall Aim: To maintain traffic calming systems to align with the designed intention.

Short term desired outcomes (1 to 2 years): Update asset inventory to reflect the current situation and assess to establish if it is still required.

Medium to long term desired outcomes (3 to 20 years): To develop a case for the funding maintenance of traffic calming measures in Derbyshire and to implement programmes of work delivering best value against Council and Highway Service objectives.

Approach: Using inventory data to develop a lifecycle approach for traffic calming measures and work towards a programme of preventative maintenance. This programme will consider all existing maintenance of traffic calming measures and propose a plan offering a coordinated, best value approach in future. In addition, the inventory data will be used in association with collision data to ensure that existing traffic calming features are appropriate.

Non-illuminated Bollards

There are approximately 2,000 non-illuminated bollards on the network and following changes to the Traffic Signs Regulations and General Directions 2016 the requirement for direct illumination of traffic signs in street lit areas has been significantly relaxed. This relaxation has presented an opportunity to consider whether an existing illuminated bollard if damaged can be replaced with a non-illuminated version, which still achieves the visibility requirements through its reflectivity sign face composition.

It presents an opportunity to improve the performance and energy efficiency of highway safety schemes, whilst achieving longer term cost savings through the reduction in energy costs and maintenance.

There are no condition surveys undertaken, however they are included in the Highway Infrastructure Asset Safety Inspections. The current approach to repairs and improvements is predominately reactive with an assessment undertaken by the traffic and safety team to establish if there is still a requirement for its presence.

Overall Aim: To maintain non-illuminated bollards that are fit for purpose and to consider whether existing illuminated ones can be replaced by non-illuminated if damaged or faulty.

Approach: We will continue to react to issues identified on the network by assessing if it is still required and repairing or removing as necessary.

APPENDICES

APPENDIX A

Table 2: Development Area Summary

Development Area Number	Development Area Title	Action Taken
1	Gross Replacement Cost for non-signals electronic traffic management	