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Highways and Transportation Asset Management Strategy

Version 2.0

RINGWAY JACOBS
integrated expertise

Essex County Council

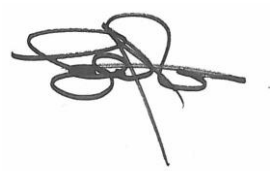
Foreword

Essex County Council maintains a vast network of roads, over 5,000 miles in total length, together with a footway network of 4,000 miles including where footways are shared use with cycleways, and 4,000 miles of public rights of way. In addition there are over 1,500 highway structures and 127,000 street lighting columns, and other asset groups such as highway drainage, vehicle restraint systems, traffic signals and traffic signs.

We recognise the vital role that the highways network plays in the lives of the residents, as well as the travelling public and local businesses. We are committed to long term cost effective and efficient management of our highway assets to maximise the benefits of its investment for all users. The *Asset Management Strategy* is at the heart of highways investment planning, budget setting and delivery of the highways and transportation service and outlines how asset investment decisions are made relating to standards, as well as how competing demands for investment are balanced in order to achieve the performance required to deliver our corporate outcomes.

The strategy also serves as the basis for the continuing development of detailed asset management planning and its implementation. This enables the organisation, its technology, and its processes to adapt to change. It embeds an approach of continuous improvement to highway asset management which includes how national developments and best practice guidance such as the *Highways Maintenance Efficiency Programme* (HMEP) and others are taken into consideration.

Through our commitment to robust asset management, we will continue to deliver our vision for Essex being a county where innovation brings prosperity.



Cllr Eddie Johnson,
Cabinet Member for Highways and Transport

Mark Rowe,
Service Director, Ringway Jacobs Ltd

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1. Context

The County Council's Highways and Transportation Asset Management Policy recognises the vital role that its highway network plays in the lives of residents, as well as the travelling public and local businesses. It sets out the importance of effective asset management of the highway network and its infrastructure, which is fundamental in supporting the Council's Vision of being a county where innovation brings prosperity, and in contributing to the Council's Corporate Outcomes.

Table 1 below shows how effective asset management helps achieve the County Council's Corporate Outcomes.

Table 1

Corporate Outcome	**How effective asset management of the highway network and infrastructure helps achieve the Corporate Outcomes**
Children in Essex get the best start in life	An accessible and serviceable highway network is vital for providing access to key services such as healthcare, education, social services, and sports facilities. Maintaining the functional quality of footways and cycleways enables children to travel to school by walking or cycling, which encourages development and brings benefits from exercise.
People have aspirations and achieve their ambitions through education, training and lifelong learning	An accessible and serviceable highway network gives people the opportunity to travel to schools, colleges, and libraries of their choice, as well as enabling them to utilise other social opportunities.
Sustainable economic growth for Essex communities and businesses	Sustaining the County Routes network in good condition promotes journey time reliability and provides access to key national and international destinations, thereby creating the right environment to attract employers to the area and encourage economic growth.
People in Essex can live independently and exercise choice and Control over the lives	An appropriately maintained highway network is vital for providing people choice in mode of travel to access services. It is also vital for providing access to social services and health care for vulnerable people who need support to live independently
People in Essex enjoy good health and wellbeing	An accessible and serviceable highway network mitigates safety risk to the travelling public, and provides access to key services such as healthcare. Together with the public rights of way network, there are opportunities for exercise through cycling and walking with access to the countryside and open spaces.
People in Essex experience a high quality & sustainable environment	Effective asset management delivers timely maintenance and value for money which ensures the best quality environment is achieved for the available funding.
People in Essex live in safe communities and are protected from harm	An appropriately maintained highway network is vital for providing access to emergency services such as the fire, police and ambulance services. Maintaining the network in good condition helps to reduce the occurrence of defects and potential safety hazards.

The Highways and Transportation Asset Management Policy sets out four key objectives for this Asset Management Strategy to ensure effective management of the Council's highways infrastructure assets. These asset management objectives are:

- **Meet Customer Needs**
- **Obtain Value for Money**
- **Promote Improvement and Innovation**
- **Achieve Corporate Outcomes**

This Strategy acknowledges the importance of national transport policy and guidance, especially the recommendations of the Highways Maintenance Efficiency Programme (HMEP), and the importance of working within legal and financial constraints, especially with respect to current and future budgets available for the maintenance of highway infrastructure assets.

This Asset Management Strategy is also supported by other County Council highway maintenance related polices and strategies including the Essex Highway Maintenance Strategy, Data Management Strategy, Essex Design Guide, and Winter Service Policy.

2. The Strategy

This section sets out how each of the Highways and Transportation Asset Management Policy objectives above are delivered.

2.1 Meet Customer Needs

2.1.1 Customer feedback

The high level of contacts from the public regarding highway condition demonstrates the importance of the highway network to our customers. Results from the annual National Highways and Transportation (NHT) survey for Essex also show that residents perceive the condition of roads and pavements as one of the most important elements of highway maintenance. This information, as well as other feedback, enables conclusions to be drawn on the wider customer perception and is used actively to support investment decision making.

Performance results are benchmarked with peer Highway Authorities, and the outcomes of our investment decisions are monitored over time to see that improvements are being achieved. Nevertheless, despite the condition of our strategic County Routes in Essex being of a standard which compares favourably with peer Authorities, residents remain dissatisfied with this aspect of the service. The condition of the Local Road network and footways has declined over recent years and a key aspect of this Strategy is to address these issues going forward and improve public satisfaction.

2.1.2 Safety

Protecting the public from harm when using the highway network and reducing the number of people killed and seriously injured on Essex roads is an absolute priority. This is addressed through keeping our assets in a serviceable condition that minimises safety risk. This is achieved through:

- Regular asset condition surveys and inspections at a frequency appropriate to the age of the asset, level of use and safety risk
- Lifecycle planning to understand when capital maintenance treatments or asset replacement is likely to be required before deterioration in the condition of the asset becomes a potential safety risk to the public
- Scheme prioritisation processes that assess safety risk, and take into account feedback from reported safety incidents on the Highway network, road traffic collision reviews, and carriageway flooding incidents
- Routine safety inspections on our assets to identify defects and safety concerns. Repairs are prioritised on a risk based approach with a ‘rapid response’ to making safe the most urgent safety defects and damage arising from road traffic collisions and vehicle strikes. This process is detailed in the Council’s Highway Maintenance Strategy. The approach also includes responses to safety concerns reported by the public.

2.1.3 Communication strategy

It is important that customers and stakeholders understand the County Council’s asset management strategy, priorities and actions, as well as the part played in the development

of these documents through customer communication and consultation. Customer and stakeholder feedback is viewed as a vital decision making tool, and is encouraged through the Council's Highways website and Contact Centre, as well as consultation with Parish Councils, District Councils, Utility companies, Emergency Services and other bodies with an interest in the Highway network.

The Council makes full use of its Highways website and other communication channels to provide information and advice on a wide range of highway related activities and its planned works programmes, policies and strategies. The website content is actively changed and improved in response to customer feedback, provides live information on roadworks, and acts as a portal for the public to report highways related problems and make requests for service.

2.1.4 Network hierarchy

In the context of supporting the County Council's Economic Plan for Essex, a new road hierarchy was introduced in 2013, creating a strategic County Route network comprising Priority 1 (PR1) and Priority 2 (PR2) roads, with the remaining network classed as Local Roads. It is the County Route network which provides the main arteries for the flow of commerce, goods and people, and therefore carries high volumes of traffic through and around the County. Investment and resources are prioritised towards this strategic County Route network, thereby encouraging wider economic investment in Essex through enhanced condition.

Essex defines its footway hierarchy into three categories, these categories acknowledge the recommendations within the Code of Practice for well Maintained Highways 2005. Furthermore; it enables prioritisation of investments in a manner which will bring value for money solutions whilst taking in to account the needs of the most vulnerable across high and low footfall areas.

The County Council has established a 'resilient network', as recommended by the 2014 Transport Resilience Review, which is the precautionary salting network based on the County Routes plus other roads as identified within the Winter Service Plan.

2.2 Obtain Value for Money

2.2.1 Lifecycle planning

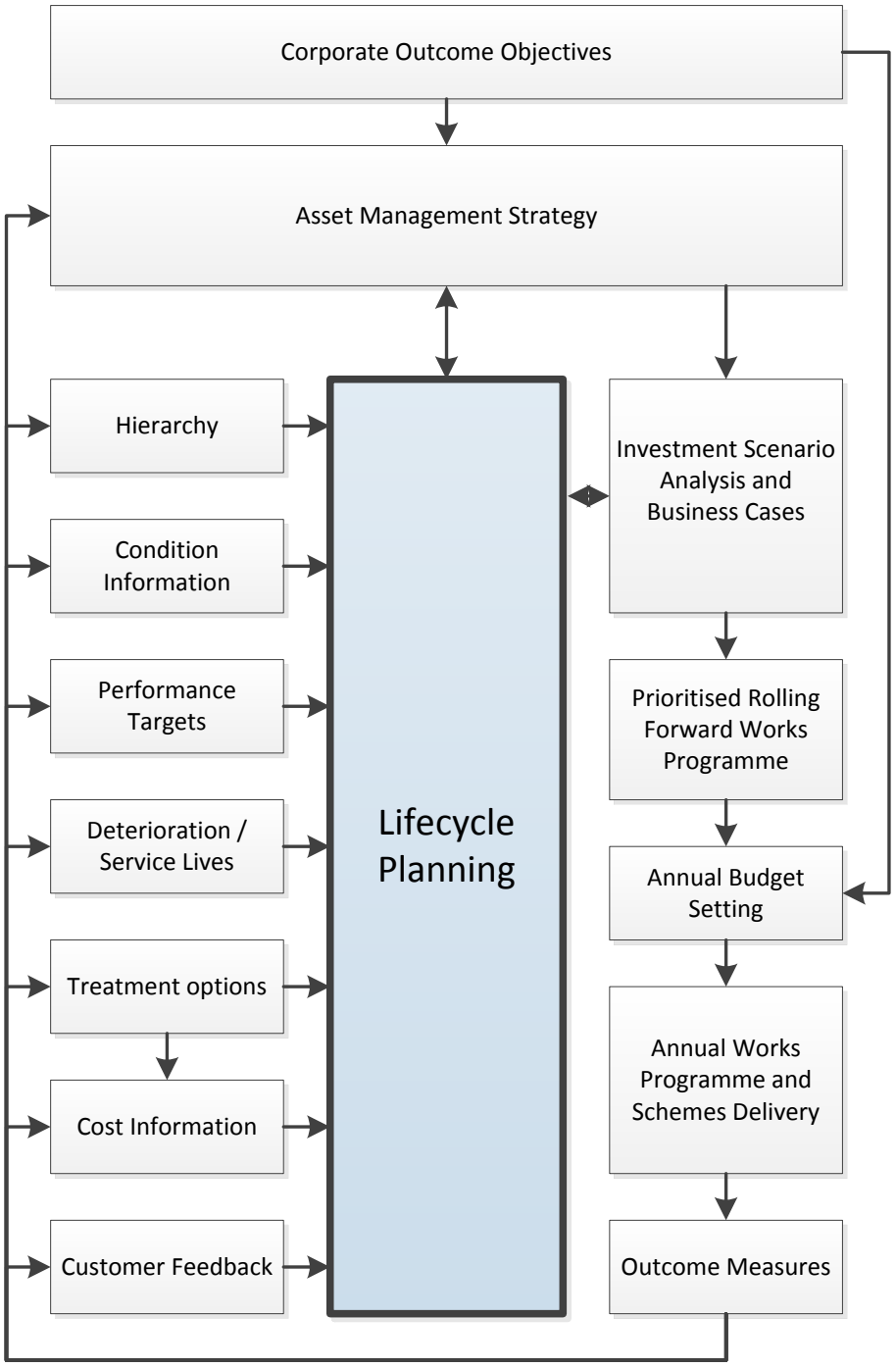
A key objective of asset management is to provide the information required for investment decision making, aligning performance targets with corporate objectives and desired outcomes. By providing options for investment levels linked to performance targets, the Council can properly assess the risks and benefits of their investment decisions. Competing demands for investment need to be balanced on a risk based approach, and prioritised across all asset groups with decisions based on sound data and evidence, taking into account the needs and expectations of the travelling public, residents, and businesses in Essex. This data and evidence is routinely collected and managed as part of the Council's Data Management Strategy.

Value for money flows from rigorous life cycle planning for each major asset group, to identify all the activities and associated costs over the life of the asset which are required to

sustain accessibility, serviceability and safety. This takes into account all maintenance and renewals activities, including environmental maintenance such as gully cleansing, and cyclical maintenance such as grass cutting and weed spraying. Analysis of asset deterioration rates, the timing of treatments and the corresponding performance they provide, generates the investment options for decision making. Lifecycle planning also facilitates the identification of the rolling forward capital maintenance works programme for all the asset groups on a risk based priority.

Lifecycle planning sits at the heart of the asset management process as shown in Fig 1 below.

Fig 1 Lifecycle Planning



Lifecycle planning brings the following benefits:

- extending asset serviceability by adopting a preventative (lower cost) treatment approach at an early stage to arrest asset deterioration
- effectively managing the safety risk posed by ageing and deteriorating assets to bring about timely replacement
- the identification of strategic, tactical and operational risk and how these are to be managed and mitigated
- determining the right combination of treatments over the life of the asset to ensure that maintenance costs are minimised
- the identification of statutory obligations and how these are to be met
- accurate prediction of performance/funding need scenarios though robust and detailed deterioration modelling based on sound asset data
- the identification of relevant performance measures and how they are to be measured over time
- establishing long term works programming to enable the supply chain to drive down costs through better resource planning, materials procurement, investment in plant and equipment
- balancing the requirement for reactive maintenance at an acceptable level

2.3 Promote Improvement and Innovation

2.3.1 Best practice

It is important that our asset management strategy and delivery processes remain relevant and up to date with current thinking and best practice, and adapt to meet the future challenges of economic growth, population growth, traffic growth, an ageing population demographic, and climate change. This is achieved through the adoption and implementation of best practice guidance, such as HMEP guidance, the 2014 Transport Resilience Review, and National Codes of Practice such as Well Maintained Highways, Well Maintained Structures, Well Lit Highways, and Management of Electronic Traffic Equipment. The Highways service is seeking recognition as a leading asset management practitioner through accreditation to ISO 55000 Asset Management standard. This will help the County Council to demonstrate its competence when bidding for third party funding for asset investment schemes.

The County Council actively participates with other national and local groups and organisations to share good practice knowledge and experience, and to benchmark our performance with other similar organisations:

- CIPFA HAMP Network
- Eastern Highways Alliance Group

- EEDET (East of England Directors of Environment and Transport) Best Practice Group
- UK Roads Board Asset Management Sub Group
- HMEP (Highways Maintenance Efficiencies Programme)
- HAUC (Highways Authorities and Utilities Committee)
- ADEPT (Association of Directors of Environment, Economy, Planning and Transport)
- Regional and cross contractual forums
- National conferences
- National Code of Practice working groups
- HTMA (Highways Term Maintenance Association)
- Other local infrastructure owners (Highways England, Network Rail, Environment Agency)
- Asset management best practice working groups across Ringway Jacobs' contracts

2.3.2 New materials, treatments and technology

We have established a Materials Working Group within the Highways service to review and update current specifications and treatment options to include the latest materials and technologies where relevant to achieve efficiency savings, and to reduce waste, carbon footprint and energy consumption. The Highways service also works closely with Ringway Jacobs shareholders, in particular with Eurovia's specialist pavement management consultancy, John Lefebvre UK, to benefit from their extensive knowledge and expertise across the UK and overseas, and to gain insight into new products emerging from Eurovia's extensive pavement research and development facilities which may benefit the Essex highway network in the future.

With Ringway Jacobs other shareholder, Jacobs, we are exploring new structural analysis techniques to better understand the load capacity of our ageing structures assets so that weak structures are correctly identified and assessed.

Our asset management IT systems are also regularly reviewed and developed, and compared to new systems to take advantage of new technology and capability where this has a cost benefit in delivering this Strategy.

2.3.3 Network reviews

Annual reviews of the priority route network are conducted to ensure that the route hierarchy continues to meet the changing needs of Essex and incorporates additional routes created through the opening of new road schemes, improvement schemes and adoption of third party developments.

2.4 Achieve Corporate Outcomes

2.4.1 Performance management framework

The County Council has established a framework of performance indicators for measuring the delivery of the Highways service which are aligned to the County Council's Corporate

Outcome Objectives. A number of these indicators relate to this Asset Management Strategy and are shown in Fig 2 below. The table shows the link between these indicators and the three Corporate Outcomes that the Asset Management Strategy influences the most.

Cabinet Members monitor the performance of the Highway service on a monthly basis through the ECC Corporate Impact Report. The indicators monitored by Cabinet Members are mainly a subset of the Council's overall performance indicators framework for the Highways service, and those related to the Asset Management Strategy are also shown in Fig 2 below.

Fig 2: Asset Management Strategy Performance Measures

Indicator Description	ECC Outcomes. Primary outcome shaded in GREEN			
	Sustainable Economic Growth	Safe Communities	Sustainable Environment	Cabinet Member's Corporate Impact Report Indicator?
Condition of PR1 Network	X	X	X	Y
Condition of PR2 Network	X	X	X	Y
Condition of Local Roads	X	X	X	Y
SCANNER RCI. PR1 Mid Bands	X		X	
SCANNER RCI. PR2 Mid Bands	X		X	
Condition of Footways	X	X	X	Y
Condition of footways 3&4	X		X	Y
% of all lighting assets working as planned		X	X	Y
Bridge Condition Score		X	X	
Repudiation rate of Highway Insurance Claims		X	X	
Timely and accurate asset inventory updates	X		X	
% P2 defects repaired / made safe within timescales	X	X	X	
Number of outstanding defects on PR1 and PR2 network		X	X	Y
Number of outstanding defects on Local Road network		X	X	Y
Reduction in preventable flooding incidents		X	X	
Timely delivery of the capital maintenance programme			X	Y
Number of KSI on Essex roads		X		Y

Publication of national road condition indicators NI130_01 and NI130_02 for A, B and C classified roads continues in accordance with government requirements.

In addition to the above, The County Council participates in the annual National Highways and Transport public satisfaction survey. These survey results, and other customer feedback, is reviewed and influences investment decision making and our communications

strategy. The customer perception measures which support the Asset Management Strategy are shown in Fig 3 below.

Fig 3: Asset Management Customer Perception Measures

Indicator Description	ECC Outcomes. Primary outcome shaded in GREEN			
	Sustainable Economic Growth	Safe Communities	Sustainable Environment	Cabinet Member's Corporate Impact Report Indicator?
Satisfaction with the condition of roads (NHT)		X	X	
Development Management satisfaction survey	X			
Public satisfaction with traffic levels and congestion (NHT)	X		X	
Public satisfaction with the time taken to complete road works (NHT)	X		X	
Satisfaction with road safety locally (NHT)		X	X	Y
Satisfaction with cycle routes and facilities (NHT)		X	X	
Public rights of way that are easy to use		X	X	Y
Satisfaction with the condition of pavements and footpaths (NHT)		X	X	

Targets for all these measures are reviewed annually to take into any account changes in corporate priorities and to drive continual service improvement. Performance results are monitored and reported throughout the year in accordance with the data collection cycle and Data Management Strategy. Any over or under performance is investigated and, if necessary, performance improvement plans are put in place.

3. Priorities for Main Asset Groups

This Section sets out the County Council's asset management priorities for its main asset groups. Main assets groups are those elements of highway infrastructure which represent the highest value of assets owned and maintained by the Council:

- **Carriageways**
- **Footways (including shared use footway / cycleways)**
- **Highway Structures**
- **Highway Lighting**
- **Intelligent Transportation Systems (ITS)**

The County Council owns and maintains other highway infrastructure such as off-road cycle tracks, cycle monitoring sites, drainage, passenger transport infrastructure, public rights of way infrastructure, non-illuminated traffic signs, vehicle activated signs, vehicle restraint systems, pedestrian guardrailing, winter management infrastructure, highway trees and other vegetation. These asset groups are also subject to this Asset Management Strategy and its Objectives.

3.1 Carriageways

3.1.1 Desired outcomes

A significant condition improvement has been achieved in recent years on the County Routes (PR1 and PR2). The priority for carriageways is to maintain the current condition of County Routes, whilst also targeting maintenance investment towards Local Roads in order to improve their overall condition. A further objective is to reduce preventable flooding incidents. Performance targets have been established which identify the required standards that deliver the Corporate Outcome Objectives, and progress towards achieving these targets is measured annually.

3.1.2 Condition Information

Our asset management approach is based on the collection of robust condition data and evidence. Road condition data is captured via the annual machine based SCANNER surveys. All County Routes (PR1 and PR2) and all Local Roads which can be accessed by SCANNER vehicles are now surveyed once a year. Other data, such as recorded defects from routine Highway safety inspections, local knowledge, maintenance treatment history, and customer feedback also assist with scheme prioritisation.

PR1 routes are also subject to an annual SCRIM survey which measures the 'skid resistance' of the carriageway surface. This survey also conforms to national standards and methodologies. The results of SCRIM surveys reveal where surface treatments may be required to address deficiencies in skid resistance and also informs the scheme prioritisation process. Feedback from road traffic collision reviews where loss of vehicle control has been identified as a significant factor also influences scheme identification.

3.1.3 Scheme identification and investment prioritisation

The long term forward programme of capital maintenance schemes is identified and prioritised through the lifecycle planning process. A preventative approach is at the heart of the prioritisation process. Capital investment will, wherever appropriate, be prioritised towards roads in the early stages of deterioration where a lower cost treatment can be applied to prolong service life and ensure value for money and minimal whole life maintenance cost.

This preventative approach enables a much larger proportion of the network to be treated annually than if a 'worst first' approach were taken requiring higher cost treatments. The preventative approach also reduces the formation of localised defects on treated roads, leading to a reduction in the revenue budget spent on reactive maintenance. This approach, which aligns with HMEP guidance, has been fundamental to the County Council's asset management strategy for many years.

The prioritised rolling forward works programme of highways capital maintenance schemes is updated annually based on this approach and the results of annual road condition data.

3.1.4 Reducing preventable flooding incidents

Effective carriageway drainage is critical to sustaining asset condition. It is also vital to reduce the risk of adjacent property flooding from carriageway run-off in extreme rainfall, and for preventing the traffic safety risk associated with excess surface water on the carriageway.

Sites which regularly flood from surface water run-off, and which require significant drainage improvement measures funded from the capital maintenance budget, are identified and recorded within a Surface Water Alleviation Scheme (SWAS) risk register. The SWAS register incorporates a scoring and prioritisation process which takes into account a range of criteria that currently includes: whether or not there has been any property flooding resulting in insurance claims, whether the location is on the 'resilient network', the road hierarchy at the location in question, the speed limit of the road in question, whether or not there has been any loss of control collisions due to surface water, the duration and frequency of flooding, and how many flood defects have been recorded at the site. This provides the basis for the prioritised forward programme of SWAS capital maintenance schemes.

The SWAS risk register also identifies whether a location is within a critical drainage area and whether or not it has been the subject of a flood investigation. This promotes collaborative working with the Council's Flood and Water Management Team which acts in accordance with the Authority's role as Lead Local Flood Authority (as per the Flood and Water Management Act 2010). Sites of mutual interest facilitate a strategy of partnership working which will continue to unlock external funding.

Our drainage infrastructure asset register is steadily being improved in accordance with HMEP guidance on the management of highway drainage. The gully inventory and gully condition data is continuously updated during routine gully cleansing operations utilising mobile IT devices fitted in gully cleansing vehicles remotely connected to our Confirm asset

management system. This information is used to inform future cleansing frequency and vehicle routes so that gullies that block more frequently or are in known flooding sites can be cleansed more frequently, and gullies cleansed less frequently in locations where the flooding risk is low.

Drainage records dating back many years have been collated from various sources and are added to the digital register on a priority based on risk where flooding issues are known. Drainage CCTV surveys are also undertaken where appropriate, and this survey information, together with the digital drainage infrastructure, is added to the Council's comprehensive library of visual information available to Highways staff.

3.2 Footways (including shared use footways / cycleways)

3.2.1 Desired Outcomes

The Council's strategy is to improve the condition of its most heavily used footways whilst maintaining the functionality of the remaining footway network. A new footway condition assessment methodology has been introduced as a result of increasing localised defects in recent years which is a growing area of concern for customers. This concern is mirrored in the number of reported footway trip incidents.

3.2.2 Condition Information - New Structural Condition Assessment

As there are currently no formal reporting measures required by central government for footway condition and machine based condition surveys such as SCANNER are not possible on the footway network, visual condition surveys are now carried out by Highway Inspectors during routine safety inspections. This new condition data provides a more readily understood measure of the condition of the footway in terms of safety and serviceability. This assessment data forms the basis of future scheme identification and prioritisation. Standards of footway condition are determined to reflect corporate priorities, and annual targets are set to drive progress towards achieving the desired standards.

3.2.3 Scheme identification and investment prioritisation

Capital maintenance for footways also follows the 'preventative approach' in a similar way to carriageways, intervening with low cost treatments such as slurry sealing before deterioration reaches the point where higher cost treatments are required.

As mentioned above, the new footway hierarchy is leading to the establishment of a rolling forward programme of capital footway maintenance for future years.

In keeping with desired outcomes, capital investment is targeted towards improving the condition of category 1 and 2 footways. However a balanced approach is taken to ensure that high priority localised defects continue be undertaken on all footway categories.

3.3 Highway Structures

3.3.1 Desired Outcomes

Structures are varied and complex assets which include bridges, footbridges, subways and underpasses, culverts, retaining walls, sign and signal gantries, and comprise many different

elements all of which are critical to accessibility, serviceability and safety of the asset. Some structures are heritage listed assets requiring special consideration and treatment.

The desired outcome is to maintain structures in a safe and serviceable condition, whilst making steady progress in addressing weak structures where strengthening or reconstruction is desirable, thereby avoiding long term traffic management restrictions which can be disruptive to the travelling public and businesses.

Unlike carriageway and footway assets, the condition of structures is often not easily visible to the public, and the need for maintenance works or other rehabilitation measures may not be apparent or well understood. Therefore good communication is required to explain the need for structures maintenance works, especially where long term disruption or closure of roads and footways may be required to implement necessary schemes.

3.3.2 Condition Information

A sustained programme of data collection has been initiated to gather better information on the current condition of the structures stock, and to comply with the National Code of Practice (although local priorities may result in departure from the Code of Practice in some instances). General Inspections are carried out on all structures once every two years. The programme of the Principal Inspections is being accelerated to identify structures which may require load capacity assessments, and to provide the detailed condition information required for lifecycle planning. This data informs the forward structures capital works programmes and the routeing of abnormal loads. Bridge Condition Index (BCI) scores are determined from condition inspections and this is monitored annually as an asset management performance measure.

A substantial number of structures that support the Council's Highway network are owned by other bodies such as Highways England and Network Rail, and by private landowners. Liaison with these owners will continue to be undertaken to ensure that the availability, condition and safety of these structures is consistent with the County Council's own structures assets.

3.3.3 Weak bridges and culverts

The Council maintains a list of weak bridges that fail to meet full load carrying capacity ascertained from load capacity assessments. While the risk of a structural failure is very low, its impact on road users and businesses can be very high and therefore a risk based preventative approach is required. As a result, many weak bridges are subject to the development of long term structural rehabilitation schemes, typically strengthening or reconstruction, and a forward programme is being put in place. In the meantime measures to mitigate the risk of those structural elements receiving loads greater than their assessed capacity are implemented where necessary via weight limits, propping, edge protection, traffic management, or increased inspection and monitoring frequency, as appropriate.

The Council is responsible for a large number of ageing watercourse culverts under the highway network. These need to be maintained in a serviceable condition to meet the County Council's responsibilities under the Flood & Water Management Act 2010 and a programme of culvert strengthening works is included with the forward Structures capital maintenance programme. Such schemes may also be included in the SWAS risk register.

3.3.4 Scheme identification and investment prioritisation

The identification of schemes is based on the results of General and Principal Inspections, and load capacity Assessments. Where a need for a strengthening or reconstruction scheme is apparent, option studies may be conducted to assess alternative design solutions in terms of cost, risk, deliverability, timescale, network disruption and other factors before proceeding to a detailed design on the preferred option.

The rolling forward structures capital maintenance programme requires more advanced planning than other asset groups as it can take several years to fully implement a structures scheme from identifying a need at Principal Inspection or Assessment stage through to implementation on site, due to the complexity of the asset, land acquisition or planning requirements, or significant utility diversions. Inter-related programmes of work are therefore developed for Principal Inspections, Assessments, Option Studies, Detailed Design and Scheme Implementation.

Capital funding for Structures maintenance works is prioritised towards:

- Strengthening or reconstruction of weak bridges where risk mitigation measures would incur long term significant traffic delay and disruption
- Structures on the strategic County Routes (PR1 / PR2) network, or on routes that provide primary access to a community not served by the County Route network
- Bridges where the form of construction makes them vulnerable to sudden failure which is not easily detected through inspections
- Structures that are already assessed as poor condition and are deteriorating
- Damaged or blocked culverts at known flood risk sites
- Structures that support well used public rights of way routes where closure would significantly inconvenience users

A rolling forward capital programme of structures maintenance is produced based on this prioritisation strategy. However, funding allocations will always be made to repair damage to structures from vehicle strikes and the like, which require immediate attention in order to keep the asset safe.

Capital maintenance schemes on some large and/or network critical structures, and on heritage structures may be very expensive and beyond the normal levels of budget allocated to the Structures asset group. There is a growing need to address asset condition deterioration on such structures due to limited funding availability in past years. Such schemes may need their own separate business cases and funding allocations in future.

3.4 Highway Lighting

3.4.1 Desired Outcomes

Highway lighting assets are a significant element of highways infrastructure. There are approximately 125,000 lighting columns, 12,000 illuminated signs, and 5,600 bollards owned by the Council. The desired outcome is to maintain these assets in a safe and serviceable condition, to maximise their service life, and to reduce ongoing energy usage and reactive maintenance costs.

3.4.2 Condition Information - Inspections and Testing

All highway lighting assets are recorded in an asset register, and are subject to an electrical test once every six years to ensure fitness of purpose. Lighting columns and illuminated signs are also subject to a structural test once every six years, with the exception of non-metallic lighting columns which are subject to a structural test once every three years.

The structural inspection of a lighting column is a 'top to toe' assessment of a column above and below ground via a risk assessment procedure. Visual external inspection of the column's bracket, shaft and base section is augmented where appropriate by the use of a probe for the internal examination of the column's shaft, base section and underground root section. The condition of the root section of a metal street lighting column is assessed via the direct measurement of metal wall thickness within the underground section down to depths of 2.0 metres.

Overall results of the structural assessment define a lighting column as either:

- Red = high priority for replacement
- High Amber = Medium to high priority for replacement
- Low Amber = Medium to low priority (repairable)
- Green = acceptable

3.4.3 Investment prioritisation

Lifecycle planning for highway lighting utilises a comprehensive asset register with age profile information, as well as fault report information and the results of electrical and structural testing. 'Red' columns are replaced on a priority basis. 'High Amber' columns are subject to an additional structural test every three years (irrespective of material type), in order to monitor the elevated risk associated with the reduced structural condition. 'High Amber' columns are not repairable, and their status will become 'Red' over time. Funding allocations will always be made to repair damage to highway lighting from vehicle strikes and the like, which require immediate attention in order to keep the asset safe.

3.4.4 Central Management System

The Council has installed remotely controlled photocells in each lighting column which link each column to the central management system. The system registers the presence of a fault when a lighting column lamp ceases working and enables the Council to plan repairs or replacement efficiently, and it also facilitates individual control of the time periods in which the lighting columns are switched on.

3.4.5 LED Lighting

The County Council is aware of the potential benefits of using LED lighting technology to reduce energy consumption, improve service reliability and service life, and reduce light pollution. However this requires a significant capital investment to replace all lamps and lantern units in the County. The Council is currently exploring the use of LED lighting at trial sites in some Essex market towns to gauge public reaction to this new form of lighting, and to check the level of reduced energy consumption that can be achieved whilst maintaining appropriate lighting levels. Depending on the success of these trials, a business case may be prepared for further investment in LED lighting on a phased basis, in tandem with the bulk lamp change and column replacement programmes.

3.5 Intelligent Transport Systems (ITS)

3.5.1 Desired outcomes

This asset group includes traffic signal equipment and controllers, traffic safety cameras, bus lane enforcement cameras, variable message signs, vehicle-activated signs, school crossing lights, traffic count sites, bus telematics, CCTV, automatic number plate recognition (ANPR) cameras and other system infrastructure. The desired outcomes are to maintain the assets in a safe and serviceable condition, and to safeguard journey time reliability by reducing equipment failures and out of service 'down times'.

3.5.2 Condition Information - Inspection and Monitoring

All ITS assets are recorded in an asset register which includes dates of installation and corresponding ages of assets. Key ITS assets are linked electronically to sophisticated software systems which monitor operation in real time and register occurrence of faults. Installations are inspected annually for electrical integrity and general condition, and are also included within the routine safety inspections undertaken by Highway Inspectors.

3.5.3 Scheme identification and investment prioritisation

Reactive funding is used to address relatively minor operational faults as well as any minor component replacement such as renewal of poles. Capital funding is used to address more complex refurbishment requirements and to replace components and assets reaching the end of their service life. Lifecycle planning to identify forward works programmes utilises a matrix of information about the asset in question; i.e. number of faults logged over time, time needed to effect repairs, age of asset, and road hierarchy of site in question.

Investment is also focussed on the development of LED technology in order to reduce energy consumption , improve electrical safety, and to reduce the need to change signal lamps. In recent years, investments in new technology have brought benefits of improved energy efficiency, operational efficiency and reduced 'down time', which has resulted in reduced congestion and enhanced public perception. The Council will continue to invest in new ITS technology, such as the recent programme to digitise safety camera systems.

4. Data Management and Systems

The maintenance of robust asset registers for recording and updating asset inventory and asset condition information is fundamental to the lifecycle planning process, as is the collection of accurate and detailed cost information for generating funding need/condition scenario options. It is the appraisal of these options, and their respective contribution to achieving corporate objectives and outcomes, that leads to the identification of appropriate standards and corresponding performance measures and targets. This data is also required for other asset management purposes such as Transport Infrastructure Valuation which is a reporting requirement under Whole of Government Accounts.

The data held in our systems includes:

- Customer contact data and correspondence
- Street Gazetteer and Network information
- Asset Registers and Inventories
- Inspection Records
- Defects records
- Condition information
- Works ordering and completion
- Maintenance histories
- As built drawings and Health and Safety Files
- Technical approval documentation for structures

Data collection and reporting directly informs the performance framework which in turn informs the Asset Management Strategy to achieve the desired outcomes. Robust data management processes are fundamental to this process and are governed by rigorous data management processes, enabling progress against achieving performance targets to be measured, monitored and reported to stakeholders. In this way data is used to demonstrate that investment is being used in an efficient and effective way that delivers value for money, and to demonstrate that the benefits of the investment are being realised.

The Council's asset data is currently stored in a number of electronic and manual systems, although the most salient data is in electronic format and is stored and controlled securely and is auditable. A Data Management Strategy has been developed which fully supports this Asset Management Strategy and the performance framework. The functionality and capability of data management systems is routinely reviewed. Software systems are regularly upgraded with new releases when available, and investment is made in additional software which improves functionality and capability where there are positive cost and time benefits.

5. Making the case for investment

5.1 Business Cases

Like most Highway Authorities, the Highways and Transportation service has to compete with other Council priorities for available funding. It is therefore important that the case for investing in the maintenance of the highway infrastructure is robustly made, that it demonstrates value for money, is based on good data and evidence, and is linked to the achievement of Corporate Outcome Objectives and targets.

Business cases are produced to bid for sustained longer term capital maintenance investment for carriageway and non-carriageway assets. Capital investment options are considered for a range of asset condition outcome scenarios which include the corresponding impact on the revenue funding requirement. This information is derived from lifecycle planning which takes into account individual asset need, but it includes recommendations on the best balance of funding across all asset groups to achieve the desired outcomes. Business cases also assess the risks and other potential consequences of under investing in asset maintenance, including the likely impact on customer satisfaction and performance outcomes. Business cases for asset investment receive considerable Cabinet Member engagement and scrutiny before budget approval is granted.

The County Council also identifies opportunities and bids for other potential sources of asset investment funding where appropriate, including from the DfT Local Highways Maintenance Challenge Fund and the South East Local Enterprise Partnership (SELEP).

6.2 Long Term Approach

A long term approach to budget setting gives more certainty to the delivery of the forward programme of works, allowing more efficient planning and procurement of resources. It also allows strategic programming with other works on the highway network, which delivers improved customer and stakeholder information. It is therefore important that progress against performance measure targets and outcomes is routinely monitored, reported and challenged in order for the benefits of the investment to be realised. Such reports are routinely reviewed by the Cabinet Member for Highways and Transportation.

6. Scheme Delivery

6.1 Rolling Forward Programme

A prioritised rolling forward programme of capital maintenance schemes underpins the effective and efficient delivery of asset investment works, and is available for the Carriageway, Highway Lighting and ITS asset groups with other main asset groups following shortly. The value of a long term forward programme is that it offers the opportunity to manage the programme strategically with a view to:

- Minimising disruption on the network
- Maximising the opportunity for collaborative working between works programmes
- Offering the opportunity to integrate larger and smaller scale works, or to integrate with planned third party works on the network (eg utilities works)
- Providing collaboration opportunities for smaller scale maintenance works by minimising the number of road closures and reducing traffic management costs

6.2 Annual Delivery Planning

The forward programme is reviewed annually with regard to changing priorities. At the start of each financial year schemes are selected in priority order to fit the available annual budget allocations. This forms the basis for the annual delivery planning process. Annual delivery plans set out the schemes and activities to be undertaken for each asset group during the financial year, how they will be delivered, the resources required, and the outputs and performance targets to be achieved. The delivery of these plans is subject to rigorous monthly challenge meetings with financial spend, performance and outputs monitored closely to ensure the full programme will be delivered within the required timescales. Collaborative working with Supply Chain Partners (SCP) provides early contractor involvement in the design, planning and procurement process. Target costing is used to drive efficiency and value for money, and to share the benefit of those efficiencies between the County Council and its Delivery Partner.

6.3 Competencies and Training

Successful delivery of this Strategy relies on competent personnel and it is important that accountabilities for asset management are clearly defined. Annual staff performance development reviews identify potential training and development needs, leading to the provision of appropriate asset management training. This ensures that asset management understanding and knowledge is continually enhanced, and that key staff members are identified and achieve recognised qualifications and certificates. The annual delivery planning process (see Section 7) identifies resource needs and ensures that adequate resources are allocated to asset management activities and that recruitment, where required, has the appropriate focus.

7. Reviewing and updating this Strategy

Asset management is a developing process within a dynamic environment. In order to deliver continuous improvement, a gap analysis has been carried out between current practices and the recommendations of the HMEP Highway Infrastructure Asset Management Guidance. An improvement action plan has been identified and is regularly monitored, and is focussed on improving our maturity as a best practice asset management led service as assessed by the central government's Local Highways Maintenance Incentive Fund Self-Assessment process.

Delivery of this Strategy is the responsibility of the Head of Asset Investment supported by Senior Management in the Highways and Transportation service, and the Council's Place Commissioning team for Transport and Infrastructure. This Strategy will be reviewed regularly to ensure it continues to provide appropriate information for informed decision making, thereby accommodating any changes in corporate priorities. However, the core principles underpinning this Strategy are unlikely to change significantly.

Next review date January 2018