



Asset Management Strategy

2019

Version 4

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 (crash barriers), 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 service and outlines how asset investment decisions are made relating to standards. It also outlines how competing demands for investment are balanced in order to achieve the performance required to deliver our corporate priorities.

The strategy also serves as the basis for the continuing development and implementation of detailed asset management planning. This enables the organisation, its technology, and its processes to adapt to change. It embeds an approach of continuous improvement to highway asset management. This includes how national developments and best practice guidance is taken into consideration, such as the *Highways Maintenance Efficiency Programme (HMEP)* and the *Well-Managed Highway Infrastructure: a Code of Practice (UK Roads Liaison Group October 2016)*.

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



Kevin Bentley: Deputy Leader of the Council and Cabinet Member for Infrastructure

Delivery of this Strategy

The delivery of this strategy forms the cornerstone of the Essex Highways Strategic Partnership in order to achieve the objectives of The Council. Both Essex County Council and Ringway Jacobs are committed to the delivery of this strategy and the associated principles, work practices and process in order to deliver an efficient, effective and value for money highways service.



A handwritten signature in black ink, appearing to read 'A Cook'.

Andrew Cook: Director for Highways and Transportation



A handwritten signature in blue ink, appearing to read 'S Butt'.

Simon Butt: Operation Director, Essex Highways

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1. Context

The County Council's Highways 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 Strategic Priorities.

Table 1 below shows how effective asset management helps support the Essex County Council Organisation Strategy 2017-21.

Table 1

Essex County Council Strategic Aims	Essex County Council Strategic Priorities	How the Asset Management Strategy supports the Strategic Aims and Priorities
<p>Enable Inclusive Economic Growth</p>	<p>Help people in Essex prosper by increasing their skills</p> <p>Enable Essex to attract and grow large firms in high growth industries</p> <p>Target economic development to areas of opportunity</p>	<p>A safe, accessible and serviceable highway network:</p> <ul style="list-style-type: none"> - gives people the opportunity to travel to schools, colleges and libraries of their choice. - promotes journey time reliability and provides access to key national and international destinations, thereby creating the right environment to attract employers to the area. This encourages economic growth which provides opportunities for employment, training and development. - enables economic growth in identified areas.
<p>Help People Get the Best Start and Age Well</p>	<p>Help keep vulnerable children safer and enable them to fulfil their potential</p> <p>Enable more vulnerable adults to live independent of social care</p> <p>Improve the health of people in Essex</p>	<p>A safe, accessible and serviceable highway network:</p> <ul style="list-style-type: none"> - provides access to key services such as, health care, education and social services. - provides access to health care, education and emergency services, helping vulnerable people to live independently - provides access to health care services. It also enables

		access to sports facilities, as well as access to entertainment and leisure facilities. It also provides opportunities for cycling, as well as opportunities for walking and horse riding – especially via Public Rights of Way which provide access to the countryside and other open spaces.
Help Create Great Places to Grow Up, Live and Work	<p>Help to secure stronger, safer and more neighbourly communities</p> <p>Help secure sustainable development and protect the environment</p> <p>Facilitate growing communities and new homes</p>	<p>A safe, accessible and serviceable highway network:</p> <ul style="list-style-type: none"> - promotes a safer environment through access to emergency services such as the fire, police and ambulance services. It also provides access to community activities and other social opportunities. - enables access for the construction of new developments, and provides growing communities with access to services. It also enables people choice in mode of travel, providing opportunities for reducing carbon footprint. It also provides access to waste collection services and recycling centres.
Transform the Council to Achieve More With Less	Limit cost and drive growth in revenue	<p>A well-managed highway network:</p> <ul style="list-style-type: none"> - delivers timely maintenance over the whole life of the assets, which results in value for money
	Develop the capability, performance and engagement of our people	<p>A safe, accessible and serviceable highway network:</p> <ul style="list-style-type: none"> - provides access to development opportunities through providing access to services and by providing the appropriate environment to attract new employers and investment.
		<p>A safe, accessible and serviceable highway network:</p>

	Re-imagine how residents' needs can be met in a digital world	- provides access to goods and services requested on line.
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The Highways Asset Management Policy sets out four key outcomes for this Asset Management Strategy to ensure effective management of the Council's highways infrastructure assets. These asset management outcomes are:

- **Enable Inclusive Economic Growth**
- **Help People Get the Best Start and Age Well**
- **Help Create Great Places to Grow Up, Live and Work**
- **Transform the Council to Achieve More With Less**

This Strategy acknowledges the importance of national transport policy and guidance, especially the recommendations of the Highways Maintenance Efficiency Programme (HMEP) and the Well-Managed Highway Infrastructure: a Code of Practice (UK Roads Liaison Group October 2016). It also acknowledges the importance of working within legal and financial constraints, especially with regard to the current financial challenges faced by the Council which impact available budgets for the maintenance of highway infrastructure assets.

This Asset Management Strategy is also supported by other County Council highway maintenance related policies and strategies including: the Essex Highway Maintenance Strategy, Policy & Standards; Essex Design Guide, and the Essex Highways Winter Service Operational Plan.

2. The Strategy

This section sets out how the Highways Asset Management Policy outcomes above are delivered.

2.1 Meets Customer Needs

2.1.1 Asset Management: People are at the Heart of what we do

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.

In recent years, despite the condition of our strategic County Routes being of a standard which compares favourably with peer Authorities, residents have indicated dissatisfaction with this aspect of the service. This view tends to reflect the condition of the Local Road network and footways. Whilst these assets had been in steady decline for a number of years, the Council increased its investment to target Local Roads. In addition, whilst footway condition overall remains a challenge, this increase in investment has facilitated a much larger programme of works annually.

Whilst the financial challenges now faced by the Council means that these increased investment levels may no longer be sustained, we aim to safeguard the current condition standards as far as practicable within the available budget envelope. It is anticipated that over time these improvements will result in steady increase in the level of customer satisfaction with these aspects of the service.

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 the following 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; i.e. a ‘rapid response’ is applied to the most urgent safety defects as well as to 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 important 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. There is also 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 Service Information Centre, as well as other communication channels such as ‘twitter’, to provide information and advice on a wide range of highway related activities, such as:

- road works information
- the current year’s programme of capital road maintenance
- monthly revenue repair figures (potholes fixed)
- current and completed highway improvement scheme information

The roadworks information page is the most visited page on the Highways website, with 522,871 page views between Nov 1, 2017 and Oct 31, 2018.

Through the online “Tell us about something” tools, members of the public are encouraged to report highway defects directly to our highway inspectors or other relevant teams via our Confirm database.

This strategic approach to communications is detailed in the annual Essex Highways Communications Service Plan. This document describes how Essex Highways engages with the wider public, highways users and customers and other key stakeholders including County Members, local residents, supply chain partners and employees.

We are always looking at ways of improving the information available and how this can best be presented in the most accessible way.

2.1.4 Network hierarchy

In the context of supporting the County Council’s Economic Plan for Essex, in 2013 a new road hierarchy was introduced, 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.

This new hierarchy was developed to categorise roads with regard to their importance in terms of enabling economic activity and access to key services, which is related to intensity of use. This hierarchy is unique to Essex, enabling inspection and maintenance resources to be prioritised in a way which best delivers the Council's Strategic Aims, provides the greatest benefit to users, and also delivers best value.

The development of this new hierarchy is in keeping with the recommendations within the 'UKRLG Well Managed Highway Infrastructure – A Code of Practice' published in October 2016. It is also in keeping with the recommendations within the DfT Transport Resilience Review published July 2014.

The Transport Resilience review recognised that with continued public expenditure reductions some local authorities would be unable to maintain the condition of all of their roads, which inevitably would impact on the resilience of some of the less important roads. In view of this, it promoted the establishment of a 'resilient' network to which priority is given through maintenance and other measures.

The Transport Resilience Review advocates the application of asset management principles, as promoted through the Highways Maintenance Efficiency Programme (HMEP), as a means of managing assets and informing spending decisions. It is the application of asset management principles that was key to the establishment of this new hierarchy.

In particular it is the PR1 routes network which is categorised as of highest importance in terms of enabling economic activity and access to key services, and it is this part of the network which is given highest priority to maintenance and other measures to maintain activity and access during extreme weather events. The PR1 routes network is the 'Resilient' network.

Essex defines its footway hierarchy into three categories – PF1, PF2 and PF3. PF 1 footways are those in high footfall areas such as town centres, PF2 are those that provide linkage between PF1 routes and local residential footways as well as some sections of busier residential footways and PF3 are generally residential and low footfall footways. These categories acknowledge the recommendations within the UKRLG Well-managed Highway Infrastructure - a Code of Practice (October 2016). 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.

2.2 Obtain Value for Money

2.2.1 Lifecycle planning

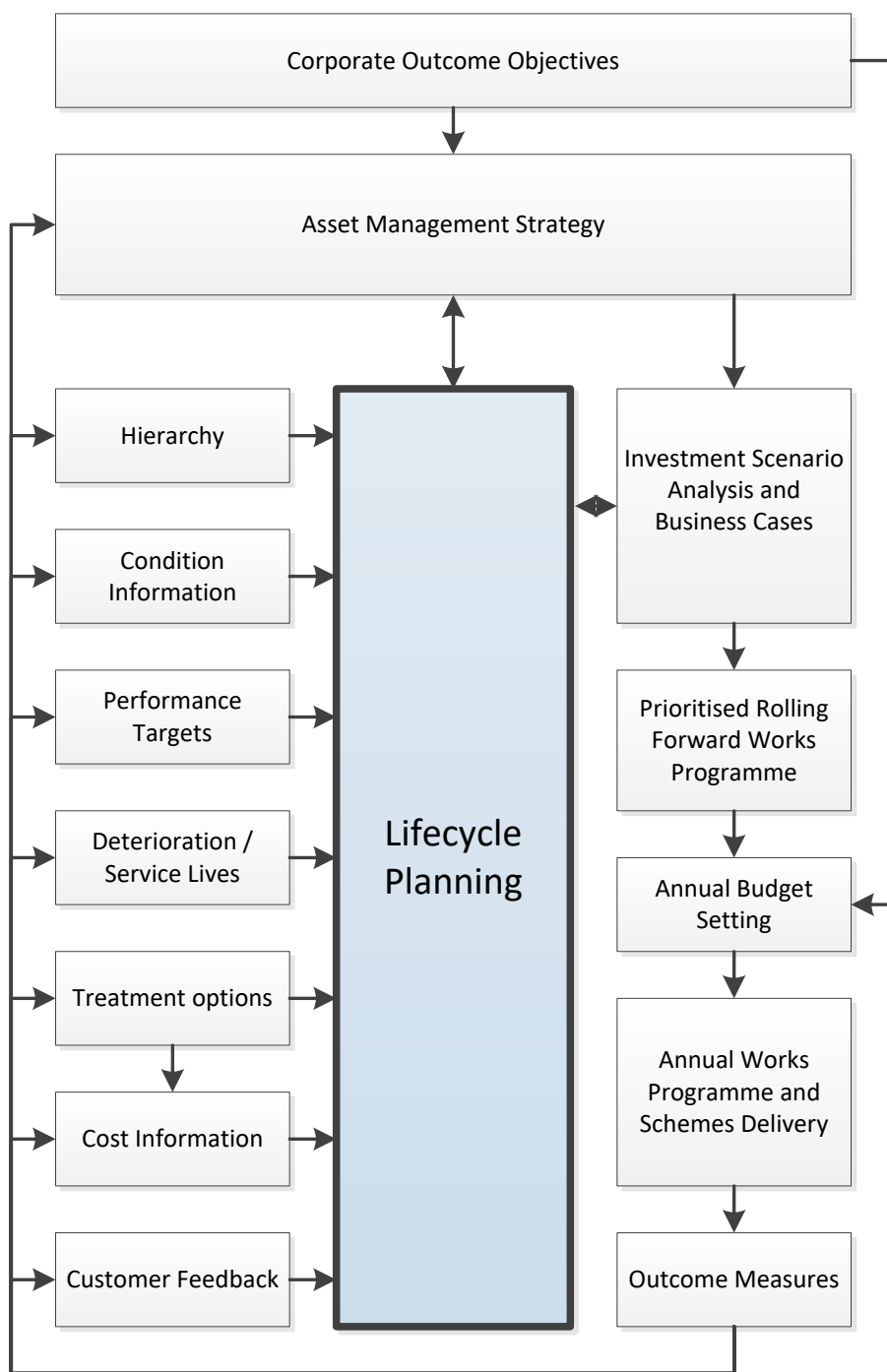
A key outcome of asset management is to provide the information required for investment decision making, aligning performance targets with the Council's strategic aims and priorities. By providing options for investment levels linked to performance targets, the Council can properly assess the risks and 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. Investment decisions also need to take 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 advanced identification of future capital maintenance works programmes for all the asset groups on a risk based priority – this assists with efficient scheduling of resources in future years.

Lifecycle planning sits at the heart of the asset management process as shown in Fig 1 below. Figure 1 also shows a clear link between the Asset Management Strategy and the Council's Organisation Strategy (Corporate Outcome Objectives).

Fig 1 Lifecycle Planning



Lifecycle planning brings the following benefits:

- extending asset serviceability by adopting a timely preventative (lower cost) treatment approach to arrest early stages of 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

- the determination of the right combination of treatments over the life of the asset to ensure that maintenance costs and exposure to risk by works operatives are minimised
- the identification of statutory obligations and how these are to be met
- accurate prediction of performance/investment need scenarios through robust and detailed deterioration modelling based on sound asset data
- the identification of relevant performance measures and how these are to be assessed over time
- establishment of long term works programming to enable the supply chain to drive down costs through better resource planning, materials procurement and investment in plant and equipment
- balancing the requirement for reactive maintenance at a sustainable 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-Managed Highway Infrastructure – A code of Practice, and Management of Electronic Traffic Equipment. The Essex Highways contract gained validation as an example of good asset management practice through accreditation to the ISO 55001 Asset Management standard in 2017/18. Ringway Jacobs has also been successful in maintaining this standard by satisfying the ISO55001 audit in 2018/19. 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 Technical Working Group within the Highways service to review and update current specifications and treatment options. This approach includes the exploration of the latest materials and technologies 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 in this area across the UK and overseas. This provides insight into new products emerging from Eurovia's extensive pavement research and development facilities which may benefit the Essex highway contract in the future.

With Ringway Jacobs other shareholder, Jacobs, we are exploring new structural analysis techniques to better understand the load capacity of our structures assets. In this way weak structures will be more readily identified and assessed, and accordingly programmed for necessary remedial works.

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. For example, it is anticipated that emerging technologies such as machine based defect identification, recording and prioritisation, will contribute to more efficient resource scheduling in the future.

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 County Council's Strategic Aims

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 Asset Management Strategy. The table shows the link between these performance indicators and the Essex County Council Strategic Aims.

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. Those measures related to the Asset Management Strategy are also shown in shown in Fig 2 below, together with their link to the Council's Strategic Aims.

Fig 2: Asset Management Strategy Performance Measures

Indicator Description	Target Performance 2018/19	ECC Strategic Aims			
		Enable Inclusive Economic Growth	Help People Get the Best Start and Age Well	Help Create Great Places to Grow Up, Live and Work	Transform the Council to Achieve More With Less
Condition of PR1 Network	2%	X	X	X	
Condition of PR2 Network	3%	X	X	X	
Condition of Local Roads	12%	X	X	X	
SCANNER RCI. PR1 Mid Bands	1%	X	X	X	
SCANNER RCI. PR2 Mid Bands	1%	X	X	X	
Condition of heavily used Footways	27%	X	X	X	
Condition of lightly used footways	26%	X	X	X	
Street lighting defects (number repaired compared to target)	34,000	X	X	X	X
Routine cleansing of drainage assets	113,000	X	X	X	
% defects repaired right first time	98%	X	X	X	X
Quality of Data in Confirm - Compliance	80%	X	X	X	
Development and delivery of road safety works and education	60%	X	X	X	
Timely completion of winter gritting routes	98%	X	X	X	
Average time to make network available following a P1 defect	1.5 hours	X	X	X	
Journey Time Reliability - (10 specified and agreed routes)	92%	X	X	X	
Fault rate of ITS equipment	40%	X	X	X	
Delivery of the annual capital carriageways renewal programme	97%	X	X	X	
Delivery of the annual ITS programme	90%	X	X	X	
Timely delivery of the structures programme	85%	X	X	X	
Delivery of the annual Capital Footways Renewal Programme	95%	X	X	X	
Delivery of the annual SWAS programme	95%	X	X	X	
Scheduled bridge inspections completed in time	98%	X	X	X	
% P1 defects attended within 2 hours	98%	X	X	X	
Number of KSI on Essex roads	764	X	X	X	
Number of Slight Injuries on Essex roads	3,124	X	X	X	
Effectiveness of casualty reduction schemes	FYRR >100%	X	X	X	
Timeliness of highway safety inspections	98%	X	X	X	
Quality of Safety Inspections	97%	X	X	X	
Use of recycled and secondary aggregate in construction	15%	X	X	X	

Publication of national road condition indicators NI130_01 and NI130_02 for A, B and C classified roads continues in accordance with government reporting requirements. Condition of Unclassified roads is also measured (via annual SCANNER road condition surveys) and is shared widely as well as bench marked with other Local Authorities. Monitoring and managing the condition of all roads is viewed as a major contributor to supporting the Councils Strategic Aims and Priorities.

In addition to the above, The County Council participates in the annual National Highways and Transport public satisfaction survey (NHT), which measures public views on a wide range of highways services. It also participates in the Customer, Quality, Cost (CQC) annual survey, which provides a measure of the efficiency of its highways services. These survey results, and other customer feedback, is reviewed and analysed in detail in order to take them into account for investment decisions and for influencing 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	Target Performance 2018/19	ECC Strategic Aims			
		Enable Inclusive Economic Growth	Help People Get the Best Start and Age Well	Help Create Great Places to Grow Up, Live and Work	Transform the Council to Achieve More With Less
Scheme satisfaction surveys	70%	X	X	X	
Development Management satisfaction survey	75%	X	X	X	
Public rights of way that are easy to use	65%	X	X	X	
Surface of roads in good condition	45%	X	X	X	
Surface of footways in good condition	55%	X	X	X	

Targets for all these measures are reviewed annually to take into any account changes in Council priorities and to drive continual service improvement. Performance results are monitored and reported throughout the year in accordance with the data collection cycle within the Data Management Strategy. Performance is compared to the target standards, and 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 footways / cycleways)**
- **Highway Structures**
- **Highway Lighting**
- **Intelligent Transportation Systems (ITS)**

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

The benefits of footways and cycle routes in providing alternative modes of travel, contribute to well-being through exercise as well as alleviating traffic congestion. Their importance in this regard is recognised by the priorities of the Council as well as the Department for Transport (DfT). Their development has attracted DfT investment and is progressing strongly, especially cycle routes where the strategic approach is aimed at establishing corridors linking key destinations throughout the County.

3.1 Carriageways

3.1.1 Desired outcomes

A significant condition improvement has been achieved on the County Routes (PR1 and PR2) in particular, as well as improvement in overall condition of the Local Roads, following increased investment by the Council in recent years. This has created the right environment to encourage economic growth.

The financial challenges now faced by the Council may no longer sustain this level of investment and it is anticipated that funding will be reduced going forward. Our aim is to maintain the current condition standards as far as practicable within the available budget. We will maximise our potential to achieve this by continuously driving down treatment costs through: innovative use of existing treatments; exploring new materials and techniques; efficiency gains from long term scheduling of resources, and embracing emerging technologies. All of these elements must be employed where suitable on the network, therefore we will rely on specialist engineering advice and consultation to target these approaches to the correct areas.

Performance measures have been established which identify the required standards that support the Council's Strategic Aims. Targets are agreed on an annual basis to reflect the current condition of the network and progress towards achieving these targets is measured annually. Capital maintenance funding is prioritised in a manner which best meets the required strategic performance whilst also taking into account local condition concerns in residential areas.

A further objective is to address flooding incidents on the network. This will be achieved through sustaining full implementation of the HMEP guidance relating to drainage management, and exploiting efficiency gains by diverting environmental resources from low demand localities to high demand localities.

3.1.2 Condition Information

Our asset management approach is based on the collection of robust condition data and evidence. Road condition data is currently captured via the annual machine based SCANNER surveys although road condition surveys will be reviewed on an annual basis to determine the most appropriate survey methodology whilst still complying with any reporting requirements to central Government. Currently, all County Routes (PR1 and PR2) and all Local Roads which can be accessed by SCANNER vehicles are surveyed once a year. Other data is also taken into account to assist with scheme prioritisation, however. This includes the identification of localised defects as well as wider observations about general condition recorded during routine Highway safety inspections. It also includes local knowledge, maintenance treatment history, and customer feedback – the latter reflects requests for service which are an important indicator of maintenance demand.

At present, 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. Feedback from road traffic collision reviews, where loss of vehicle control has been

identified as a significant factor, contributes to surface treatment scheme identification and prioritisation.

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. This approach minimises the amount of network that deteriorates annually to the point where high cost, strengthening treatments are required, and therefore ensures 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 such as potholes 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 future years works programmes of highways capital maintenance schemes is updated annually based on the results of annual road condition survey data, together with other information, and the application of this preventative approach.

3.1.4 Addressing preventable flooding incidents

Effective carriageway drainage is critical to sustaining asset condition. It is also vital to reducing 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 an on-line 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 insurance claims from flooding, 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, whether or not it has been the subject of a flood investigation, and whether there has been any internal or external property flooding. 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. Partnership working on sites of mutual interest has also now extended to Anglian Water and the Environment Agency.

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 can 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 infrastructure records dating back many years have been collated from various sources and are being added to the digital register on a priority based on risk. Drainage CCTV surveys are also undertaken where appropriate, and this survey information is added to the Council's comprehensive library of visual information available to Essex Highways staff. This data assists engineers/officers in understanding the cause of accumulations of water on the highway, and thereby contributes to resolution of these issues.

3.2 Footways (including shared use footways / cycleways)

3.2.1 Desired Outcomes

The Council's strategy is to improve the condition of its low footfall footways (those in residential areas) whilst maintaining the functionality of the remaining footway network. A new footway condition assessment methodology has been introduced in response to 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 relating to 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 contributes to scheme identification and prioritisation.

3.2.3 Scheme identification and investment prioritisation

Wherever practicable, capital maintenance for footways also follows the 'preventative approach' in a similar way to carriageways; i.e. the use of low cost treatments such as slurry sealing before deterioration reaches the point where higher cost, strengthening treatments are required.

The new footway condition assessment data, as well as other information such as 'localised defects', customer requests for service, reports of footway trips, combine to form the basis for maintenance prioritisation. The new footway hierarchy referenced above has enabled the establishment of a rolling forward programme of capital footway maintenance sites.

In spite of increased investment for footways capital maintenance in recent years, the condition of footways remains a challenge for the Council. It is also possible that investment levels may reduce going forward. Whilst sound data and evidence remains the basis for works prioritisation, programming also takes into account the requirement to safeguard user safety as far as practicable by addressing areas which have been the subject of trips. Whilst there may be a higher occurrence of these incidents on one hierarchy compared to another, a balanced maintenance approach is achieved overall by ensuring that localised defects which are a high priority for repair continue to be undertaken on all footway hierarchies.

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. Structures also 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 strategic outcome is to maintain structures in a safe and serviceable condition. It is also to address weak structures where strengthening or reconstruction is required, thereby avoiding long term traffic management restrictions which can be disruptive to the travelling public and businesses, especially with regard to heavy goods vehicles.

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. In consequence 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 take into account the recommendations in the UKRLG Well-Maintained Highway Infrastructure – a Code of Practice (October 2016). It should be noted that 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 routing of abnormal loads. Bridge Condition Index (BCI) scores are determined from condition inspections and this is monitored annually as an asset management performance measure.

Lifecycle planning is carried out via the Structures Toolkit whose use is promoted as good asset management practice in the HMEP asset management guidance. The toolkit has been created to support all Local Authorities in completing their structures valuations which is a reporting requirement under Whole of Government Accounts. The toolkit has been developed in full compliance with the Highways Network Asset Code which supports the calculation of Gross Replacement Cost, Depreciated

Replacement Cost, Accumulated Depreciation and Annual Depreciation values for structures. Through the employment of budget information this Toolkit also facilitates the effect of investment scenarios on condition performance, and therefore contributes to effective investment and works planning.

It is worth noting that 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. A corresponding future works programme is in place and is subject to regular review following new inspection and assessment information. 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. Whilst this may not be regarded as ideal, it should be noted that much of the structures stock was built during times when current demands could not have been foreseen or accounted for.

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. Indeed it can take several years fully to implement a structures scheme from identifying a need at Principal Inspection or Assessment stage through to implementation on site. Part of the reason for this is the inherent complexity of structures assets, but it is also due to the requirement for land acquisition or planning requirements, or significant utility diversions. Joined programmes of work are therefore required and developed for Principal Inspections, Assessments, Option Studies, Detailed Design and Works, in order to have the correct information and resources at the appropriate time for implementing the scheme.

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 of strategic importance or providing singular access to communities as indicated by their position within the Structures hierarchy (to be implemented from 1st April 2019)
- 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, where immediate attention is required 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 Local Authorities. Due to low investment levels in past years there is now a growing need to address asset condition deterioration on such structures. To address this we will continue to develop communications with central government with a view to making these structures special cases for investment in the future.

3.4 Highway Lighting

3.4.1 Desired Outcomes

Highway lighting assets are a significant element of highways infrastructure. There are approximately 127,000 lighting columns, 13,600 illuminated signs and posts, and 4,500 bollards owned by the Council, plus a significant number of other highway lighting infrastructure which requires maintaining. 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, illuminated signs and beacons are also subject to a structural test once every six years, with the exception of non-metallic lighting columns/posts 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/post as either:

- Red = high priority for replacement
- High Amber = Medium to high priority for replacement or re-test in three years
- Low Amber = Medium to low priority (repairable)
- Green = acceptable until next test in six years

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, where immediate attention is required in order to keep the asset safe.

3.4.4 Central Management System

The Council has installed remotely controlled Telecells in each lighting column which link each column to an on-line 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. It also facilitates individual control of the time periods in which the lighting columns are switched on. This facilitates efficient management of highway lighting with a view to reducing overall energy costs.

3.4.5 LED Lighting

The County Council has long been aware of the potential benefits of using LED lighting technology to reduce energy consumption, improve service reliability and service life, and reduce light pollution. An experimental use of LED lighting was undertaken at trial sites in some Essex market towns, in order to gauge public reaction and to check the level of reduced energy consumption. Following this successful project a substantial capital asset replacement programme was commenced to replace existing sodium/mercury lamp technology with LED technology.

A significant number of lighting columns have already been converted to LED technology, and it is anticipated that the remaining street lights will be converted to LED technology in a three year programme from 2019/20. After this programme, whilst some illuminated signs will still be using sodium/mercury lamp technology, these will be converted to LED technology during maintenance operations over time.

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'. This has resulted in reduced congestion and improved journey time reliability which has enhanced public perception of the service. 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. Also fundamental is the collection of accurate and detailed cost information for generating investment need/condition performance scenario options. It is the appraisal of these options, and their respective contribution to achieving corporate strategic aims, that leads to the identification of appropriate investment levels/standards and corresponding performance measures and targets. This data is also required for other asset management purposes such as Highways Network Asset Valuation which is a reporting requirement for Local Authorities 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
- Asset installation/implementation dates and service lives
- Asset location information
- Works ordering and completion
- Maintenance histories
- Technical drawings of completed schemes and Health and Safety Files
- Technical approval documentation for structures

Use of all data complies strictly with data protections laws.

Data collection and reporting directly informs the performance management framework which in turn monitors the effectiveness of the Asset Management Strategy in achieving the desired strategic aims. Robust data management processes ensure progress against achieving performance targets is measured, monitored and reported reliably to managers and other stakeholders. In this way performance 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 anticipated 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. A Data Management Strategy has been developed which supports fully the Asset Management Strategy and corresponding performance framework. The functionality and capability of data management systems is routinely reviewed. Software systems are regularly upgraded with new releases, and investment is made in additional software which improves functionality and capability where positive cost and time benefits can be derived. Variances between performance results and targets are investigated and plans are put in place to realign where required.

5. Making the case for investment

5.1 Business Cases

Like most Highway Authorities, the Highways 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 made robustly, that it demonstrates value for money, is based on good data and evidence, and is linked directly to the achievement of Corporate strategic aims.

Business cases are produced to bid for sustained longer term capital maintenance investment for carriageways and other 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 aims. 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. This includes investment initiatives from the DfT, such as the Local Highways Maintenance Challenge Fund, as well as investment opportunities from the South East Local Enterprise Partnership (SELEP). The County Council will continue to explore all potential sources of additional investment.

5.2 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 enables strategic programming with other works on the highway network, which delivers value for money through shared resources. This approach also results in improved customer and stakeholder information. It is therefore important that progress against performance measure targets is routinely monitored, reported and analysed in order to ensure the benefits of the investment are realised. Such reports are routinely reviewed by the Cabinet Member for Highways and Infrastructure.

6. Scheme Delivery

6.1 Rolling Forward Programme

A prioritised programme of capital maintenance schemes in future years for each major asset group underpins the effective and efficient delivery of asset investment works. 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 (e.g. works of utility companies)
- Providing collaboration opportunities for smaller scale maintenance works by minimising the number of road closures and reducing traffic management costs
- Optimising delivery by bringing forward schemes which are in the immediate locality of other works

6.2 Annual Delivery Planning

The forward programme is reviewed annually to take account of new data, changing priorities and changes in investment. Prior to the start of each financial year schemes are selected in priority order to fit the annual budget allocations which are aligned to performance targets. 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 review meetings to scrutinise performance and outputs to ensure the full programme will be delivered within the required timescales and to budget. Collaborative working with Supply Chain Partners (SCP) provides early contractor involvement in the design, planning and procurement process. Tendering works across the supply chain to derive a favourable 'target delivery cost' drives efficiency and value for money while sustaining quality. This approach is incentivised through the sharing of financial benefits between the County Council and its Delivery Partner, which drives a culture of continuous improvement.

6.3 Competencies and Training

Successful delivery of this Strategy relies on competent and suitably experienced personnel, and it is therefore 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 those with key roles in asset management are identified and supported to achieve recognised qualifications and certificates. The annual delivery planning process (see Section 6.2) identifies resource needs and ensures that adequate resources are allocated to asset management activities and that the recruitment programme has the appropriate focus.

7. Reviewing and updating this Strategy

Asset management is a developing process within a dynamic environment, and we continuously monitor changes and new guidance within the industry to ensure that our expertise remains relevant. In recent years Essex Highways has proved its maturity as a best practice asset management led service through establishing compliance with DfT guidelines relating to the highest level of competence in asset management. This level of competence is assessed by the DfT's Local Highways Maintenance Incentive Fund Self-Assessment process, and ensures the Council receives its full allocation from the DfT for this area of funding. Local Authorities who are unable to comply with the same level of competence receive reduced levels of funding from the DfT.

Delivery of this Strategy is the responsibility of the Asset and Records Manager supported by Senior Management in the Essex Highways service and the Council's Essex Highways Commissioning team for Transport and Infrastructure. This Strategy will be reviewed regularly to ensure it continues to be aligned to the Council's Strategic Aims and provides appropriate information for informed decision making. However, the core principles relating to effective asset management underpinning this Strategy are unlikely to change significantly.

Next review date January 2020