Highways Infrastructure Asset Management Plan

2024

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Lincolnshire COUNTY COUNCIL
Working for a better future

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Registry of Amendments

Amendment Number	Date	Brief Description of Amendments made	Name and Job Title
1	July 2024	Full review and update of the 2022 HIAMP document with changes throughout to include amendments to dates, hyperlinks and policy titles	Clair Dixon, Policy and Strategic Asset Manager
2	July 2024	Volume 2 updated to include information on the use of AI, inspection frequency of laybys, competence and training for officers carrying out inspections	Clair Dixon, Policy and Strategic Asset Manager
3	July 2024	Volume 5 updated to include update on cleaning cycle schedule and night scout response times amended	Clair Dixon, Policy and Strategic Asset Manager
4	July 2024	A new Arboriculture volume (volume 6) has been created. Any relevant Arboriculture information from volume 2 Highways has been moved into volume 6 and updated accordingly	Clair Dixon, Policy and Strategic Asset Manager
5	July 2024	Appendix B updated to include edge damage less than or equal to 40mm, note added in relation to defects in laybys and note added in relation to defects at junctions with differing hierarchies	Clair Dixon, Policy and Strategic Asset Manager

Foreword

The Highways Infrastructure Asset Management Plan reflects the approach outlined in the Code of Practice "Well-Managed Highway Infrastructure". This Code of Practice serves as a guidance document to Local Authorities, encouraging them to implement a Risk-Based Approach within their service. This document demonstrates our continued commitment to a Risk-Based Approach, whilst taking into account the specific local factors that define our County.

We have, for some time been committed to developing a consistent, proactive approach towards our service. Therefore, we are continuing to demonstrate best practice with regards to Asset Management. Recent weather events show us that this approach is very much the right way for us to deliver our service, to make maximum use of our available resources. Our asset-led approach has already fostered results throughout the years, notably through our efforts to align ourselves with the Department for Transport's requirements through the Self-Assessment Process. These efforts enabled us at the time to become one of the first two authorities to achieve Band 3-status with the DfT, receiving maximum funding as a consequence.

National indicators through network level surveys have demonstrated an overall improvement in the condition of our classified and unclassified network by enforcing effective Asset Management. Although however critical, the carriageway network should not be the Plan's sole focus of attention. The Plan will highlight our linked approach towards all Assets that are the responsibility of our Highways Service. Therefore the Plan has been divided up into a Highways, Structures, Drainage, Street Lighting and Arboriculture Volume. All Volumes should show our commitment towards reactive and proactive maintenance for these Assets through the use of a risk-based approach. Our new Highways 2020 Contracts have been designed to help deliver the quality of highway services which reflect an asset management approach and a focus on effective and efficient service delivery.

Lincolnshire, with its distinct rural tone surrounding developing and growing urbanised centres such as Grantham, Lincoln City, Boston, and Spalding among others, requires an efficient highway network that takes into account all factors that may be influencing its development. We as a service believe that Asset Management is the correct way to deal with the challenges ahead for our Highways Service.

Councillor Richard DaviesExecutive Councillor: Highways, Transport and IT

Volume 1 - Overarching Principles

1. Introduction

1.1. Principles and Context of the Plan

1.1.1. This document replaces the Highways Infrastructure Asset Management Plan (HIAMP) 2023 and applies to all our Highway Assets.

1.1.2. The HIAMP is produced as a single plan spanning six volumes to emphasise an integrated approach to highway network infrastructure assets. Overarching matters are dealt with in volume 1 and additional asset-specific matters are dealt with in volumes 2, 3, 4 5 and 6. This approach is consistent with the Highways Infrastructure Asset Management Strategy.

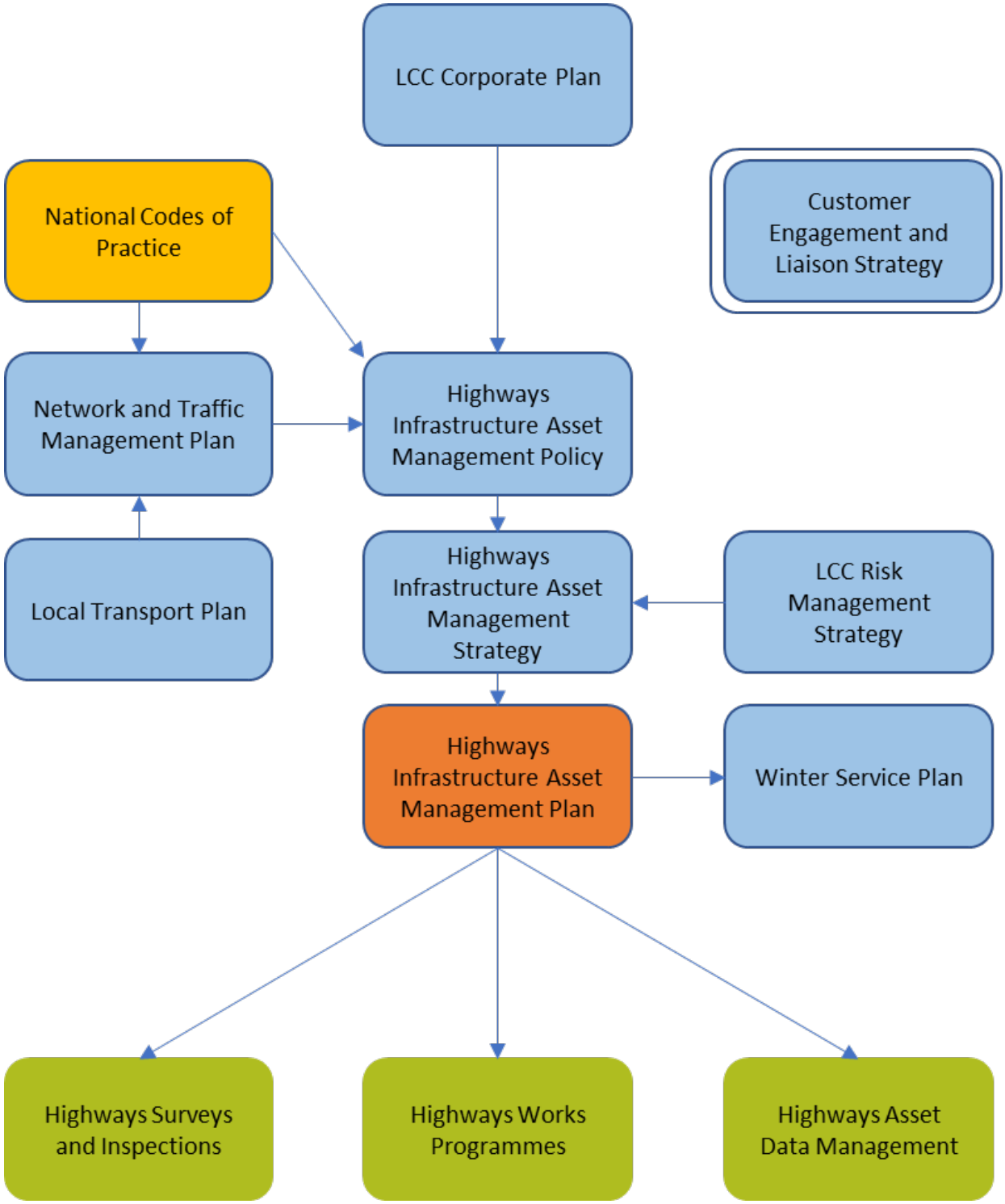
1.1.3. It is designed to align with the guidance in Well Managed Highway Infrastructure – Code of Practice (October 2016), whilst setting out a specific approach in line with local needs and priorities. There has been a shift from the previous guidance set out in Well Managed Highways – Code of Practice for Highway Maintenance Management (July 2005) which was prescriptive, to a risk-based approach determined by each highway authority. This plan will set out that approach considering appropriate analysis and development.

1.2. Status of the Plan

1.2.1. This plan is approved as an operational policy document by the Executive Councillor for Highways, Transport and I.T. The plan is subject to annual scrutiny from the elected members and will be reviewed as such on an annual basis. The action plan highlighted in Appendix F demonstrates a continuous approach to trying to improve our service through effective asset management.

1.3. Links to Other Documents

1.3.1. The HIAMP forms part of a suite of documents which define our asset management policies. The links to other documents are set out in the diagram below:


LCC Corporate Plan
National Codes of Practice
Customer Engagement and Liaison Strategy
Network and Traffic Management Plan
Highways Infrastructure Asset Management Policy
Local Transport Plan
Highways Infrastructure Asset Management Strategy
LCC Risk Management Strategy
Highways Infrastructure Asset Management Plan
Winter Service Plan
Highways Surveys and Inspections
Highways Works Programmes
Highways Asset Data Management

1.4. Maintenance Practice

1.4.1. We undertake several maintenance activities on the highways network which will be outlined throughout the course of this document.

1.4.2. Maintenance types contribute in varying degrees to the core objectives of safety, customer service, serviceability and sustainability. Levels of service and delivery arrangements shall be established having regard to these objectives and be focussed on outcomes.

1.4.3. The main types of maintenance are as follows:

Routine – Regularly scheduled works (often cyclic). For example, lamp replacement, drainage cleansing, grass cutting and sign face cleaning

Reactive – Safety-based, responding to inspections, customer reports or emergencies

Planned – Planned schemes to extend the life of or renew an asset

Regulatory – Inspecting and regulating the activities of others affecting the highway

Winter Service – Gritting and snow ploughing in adverse weather

1.5. Scope of the Plan

1.5.1. This document will comprise of the following five asset specific volumes:

- highways
- structures
- drainage
- street lighting, and
- arboriculture

1.5.2. Where appropriate, each asset group volume will contain the following information: Legal Framework, Asset Condition, Asset Management, Asset Inspection and Asset Programming. All these core elements generate a consistent approach to best-practice asset management, and it puts into practice the requirements of good life-cycle planning as outlined within our Highways Infrastructure Asset Management Strategy.

1.5.3. The HIAMP is not intended as a detailed technical reference for all aspects of highway infrastructure maintenance, or to repeat technical guidance available elsewhere. Areas referred to but not dealt with in detail include:

- highway improvement and new construction
- network management, including the traffic management duty, or equivalent such as permitting schemes and management of utilities, which is dealt with in our Network and Traffic Management Plan
- management and maintenance of Public Rights of Way

- highway development management, including securing funds associated with developer obligations
- town centre management, including use of public space.

2. Policy Framework

2.1. Asset Management

2.1.1. The Highways Infrastructure Asset Management Guidance (HIAMG) defines asset management as follows:

"A systematic approach to meeting the strategic need for the management and maintenance of highway infrastructure assets through long term planning and optimal allocation of resources in order to manage risk and meet the performance requirements of the authority in the most efficient and sustainable manner."

2.1.2. The Association of Directors of Environment, Planning and Transport (ADEPT) has defined asset management as:

"A strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highways infrastructure to meet the needs of current and future customers."

2.1.3. We are committed to the development of an asset management led approach to the maintenance of highways infrastructure assets. This is highlighted by our continual band 3 status audited by central government through the incentivised fund created in December 2014. One element of this funding regime rewards authorities who can demonstrate that they have adopted an asset management-based approach to the management of their infrastructure assets.

2.1.4. Our Highways Infrastructure Asset Management Policy and Highways Infrastructure Asset Management Strategy set out the high-level principles of the management of the highway assets.

2.1.5. Asset management supports making the case for funding, for better communication with stakeholders, and facilitates a greater understanding of the contribution that highway infrastructure assets make to economic growth and social well-being of local communities, in line with the requirements set out by the Lincolnshire Joint Strategic Needs Assessment and the Joint Health and Wellbeing Strategy.

2.1.6. Authorities have certain legal obligations with which they need to comply, and which may be the subject of claims for loss or personal injury or of legal action by those seeking to establish non-compliance by authorities. It is recognised that in such cases, Well Managed Highway Infrastructure – Code of Practice (October 2016), may be regarded as a relevant consideration. Where, in the light of local circumstances, we have elected to adopt policies

or approaches different from those suggested by the Code, they are identified, together with the reasoning for such differences, within this Plan.

2.1.7. We have developed a Highways Infrastructure Asset Management Policy document, outlining our approach towards effective asset management in line with the member-approved asset management principles developed by us as a whole.

2.1.8. We have further developed a Highways Infrastructure Asset Management Strategy, outlining our funding requirements to maintain our assets in a defined position. It aims to provide the optimum balance between responsible investment of public money, and the maintenance of the highways asset at an acceptable standard, based on the latest lifecycle planning and whole-life asset management science.

2.2. Stakeholders and Communication

2.2.1. Stakeholder expectations and effective customer communication are highly important to us, and we have a Community Engagement Policy and a Community Strategy in place. This has driven the Customer Engagement and Liaison Strategy for Highways, written in line with service delivery and our asset management led approach, putting the customer at the heart of our service. Considerations for this strategy and the communication of highways asset management have been developed to and in excess of recommendations within UKRLG Highway Infrastructure Asset Management Guidance Document, Part A.

2.2.2. Arrangements have been established to facilitate the involvement of all authority elected members, employees, contractors and agents in building commitment and pride in the highway maintenance service and maximising individual contributions to the process of continuous improvement. These arrangements are not set out in detail within this plan but are covered in our Highways Infrastructure Asset Management Strategy.

2.3. Other Authorities

2.3.1. Consultation with other local, combined and strategic adjoining highway authorities has taken place to discuss the changes proposed within the Code of Practice. A consistency in service, despite the various approaches towards implementing the Code of Practice, has been ensured by communicating with all adjacent authorities.

2.3.2. Responsibility for assets on our boundaries, for example, river bridges, has been agreed with adjoining authorities. We have outlined all our boundaries with adjacent local authorities and included them within our Asset Management System.

2.3.3. We have entered into agreements with adjacent authorities for certain aspects of service to be carried out by one council on behalf of the other. Specific cross boundary gritting route responsibilities can be found in the Winter Service Plan.

3. Legal Framework

3.1. General and Specific Requirements

3.1.1. All duties, powers and legislation, both general and those specifically related to assets are dealt with in Appendix E of this plan.

3.1.2. Much of highway infrastructure maintenance activity is based upon statutory powers and duties contained in legislation and interpretations of these powers and duties provided by the court.

3.1.3. All those involved in highway maintenance with us should have an appropriate understanding of their duties and powers, their implications, and the procedures used to manage and mitigate risk.

3.1.4. Specific legislation mentioned is generally that for England.

4. Strategy and Hierarchy

4.1. Highways Infrastructure Asset Management Strategy

4.1.1. Our Highways Infrastructure Asset Management Strategy has been developed in line with the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG) Part B.

4.1.2. Our Highways Infrastructure Asset Management Strategy sets out how the Highways Infrastructure Asset Management Policy is to be achieved, how long term objectives for managing the highway are to be met and how the strategy is to be implemented, including setting targets and measuring performance. It sets clear direction, provides links with other relevant documents, such as corporate plans, and sets out the benefits of investing in the highway infrastructure.

4.1.3. The development of our HIAMP shows that we are delivering value when maintaining highways as well as addressing wider objectives of our Corporate Plan and Local Transport Plan.

4.1.4. The HIAMP will be a key component of the Highways Infrastructure Asset Management Strategy and will include such items as:

- a set of objectives and policies linked to business objectives through network safety, customer service, network serviceability and network sustainability
- managing risk of failure or loss of use
- development of co-ordinated forward programme for highway maintenance, operation and improvement
- performance monitoring and continuous improvement

4.1.5. We adhere to the Highways Maintenance Efficiency Programme (HMEP) sector-led transformation programme. It is designed to help identify radical transformational opportunities and potential for improvements in operating efficiency of the local highways sector which it is aimed at.

4.1.6. HMEP has developed a series of products to inform highways authorities of examples of best practice and recommendations which should lead to an improved highway maintenance service and better value for money for public funds.

4.1.7. We have adopted, where affordable, recommendations which add value to current practices.

4.1.8. The HMEP Pothole Guidance and HMEP Asset Management Guidance products both recommend that authorities should employ an asset management approach. The principle "prevention is better than cure" in determining the balance between structural, preventative and reactive maintenance activities has been embraced by us. This philosophy should improve the resilience of the highway network and reduce the occurrence of potholes in the future, informing the risk-based approach to response times in a move to "first-time fixes" to highway defects.

4.2. Functional Hierarchy

4.2.1. A network hierarchy based on asset function is the foundation of a risk-based maintenance strategy. It is crucial in establishing levels of service and to the statutory network management role for developing co-ordination.

4.2.2. The hierarchy structure adopted reflects the whole highway network and the needs, priorities and actual use of each infrastructure asset. The carriageway hierarchy, for example, is determined partly by traffic volume, but also influenced by factors such as pedestrian or cyclist usage amongst other factors. Collectively, these issues may be referred to as the ‘functionality’ of the section of highway in question.

4.2.3. The hierarchies outlined are maintenance hierarchies. They will be utilised to determine inspection frequency and reactive maintenance response times first and foremost. The maintenance hierarchies will also be used to increase efficiency within the use of our scheme selection toolkit.

4.2.4. Lincolnshire is a large and sparsely populated county with a greater than average length of road per head of population. The length of the road network is 9,255 km of carriageway. The network also comprises 4,410 km of footway and cycleway. Clearly it is not practicable to develop and maintain the whole of the road network to the same standards.

4.2.5. Therefore, we have designated a hierarchy of road types with each highway link being allocated to one of these types. The types reflect the roles of different carriageways, and footways/cycleways based upon these principles.

4.2.6. Hierarchies are dynamic and will be regularly reviewed to reflect changes in network characteristics and functionality so that maintenance strategy reflects the current situation, rather than the use expected when the hierarchy was originally defined.

4.2.7. Where major maintenance, construction or other development signalling a change over the long term involves significant traffic diversion, or when congestion in one part of the network results in traffic shift to another part of the network, these changes shall be reflected in the hierarchy and subsequently in the maintenance and network management regimes.

4.3. Carriageway Hierarchy

4.3.1. Carriageway hierarchy will not necessarily be determined by the road classification, but by functionality and scale of use. Hierarchy MRN, 1 and 2 roads comprise the county's strategic road network. Table 1 sets out our local maintenance hierarchies.

Table 1

Our Local Standard	National Standard
Major Road Network Local highways authority selected A roads that have a strategic importance which links areas across the UK. These routes encounter constant high levels of traffic and should be easily accessible and identifiable. Further consideration to be made is the traffic generated by seaside tourism during the vacation months, which creates the need for robust routes to seaside attractions. They will be the primary component of our resilient network and subsequently our precautionary salting network. Major Road Network in Lincolnshire to include: • A15 (M180 to Sleaford) • A16 • A17 • A52 (Boston – Skegness) • A57 (Dunham bridge from A1 – Lincoln) • A46 (Lincoln Saxilby Road Roundabout to Nettleham Road roundabout) • A151 • A158	**Category 2 - Strategic Route** Trunk and some principal "A" roads between primary destinations. Routes for fast-moving long-distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are generally prohibited.

Our Local Standard	National Standard
Hierarchy 1 Major long distance, inter-urban routes, which either: • provide a network of routes for traffic passing through the county, • link major urban areas (over 8000 population) to major urban areas outside the county Particularly for long distance through industrial and commercial traffic.	**Strategic Route** Trunk and some principal "A" roads between primary destinations. Routes for fast-moving long-distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are generally prohibited.
Hierarchy 2 The remaining inter-urban routes of more than local importance by virtue of their role in handling substantial flows of long-distance traffic between: • adjacent towns within the county. • Lincolnshire towns near the county boundary and nearby centres of populations in adjacent counties.	**Main Distributor** Major urban and inter-primary links. Short to medium distance traffic. Routes between strategic routes and linking urban centres to the strategic network with limited frontage access. In urban areas speed limits are usually 40mph or less, parking is restricted at peak times and there are positive measures for pedestrian safety.
Hierarchy 3 Local roads which provide a good quality connection between the main settlements (population of 500 plus) to the MRN, H1 and H2 roads, including rural bus routes and links to major HGV generators.	**Secondary Distributor** B and C class roads and some unclassified urban routes carrying bus, HGV and local traffic with frontage access and frequent junctions. In rural areas these roads link the larger villages and HGV generators to the strategic and main distributor network. In built areas these roads have 30 mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings. On-street parking is generally unrestricted except for safety reasons.
Hierarchy 4 Classified roads, which link the smaller villages and settlements to the MRN, H1, H2 or H3 roads.	**Link Roads** Roads linking between the main and secondary distributor network with frontage access and frequent junctions.

Our Local Standard	National Standard
	In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two-way traffic. In urban areas they are residential or industrial inter-connecting roads with 30 mph speed limits random pedestrian movements and uncontrolled parking.
Hierarchy 5 Unclassified roads, which link the smaller villages and settlements to the MRN, H1, H2 or H3 roads.	**Link Roads** Roads linking between the main and secondary distributor network with frontage access and frequent junctions. In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two-way traffic. In urban areas they are residential or industrial inter-connecting roads with 30 mph speed limits random pedestrian movements and uncontrolled parking.
Hierarchy 6 Urban and rural roads whose main purpose is to provide access to residential properties or provide access to agricultural land.	**Local Access Road** Roads serving limited numbers of properties carrying only access traffic. In rural areas these roads serve small settlements and provide access to individual properties and land. They are often only single lane width and unsuitable for HGVs. In urban areas they are often residential loop roads or cul-de-sacs.
Hierarchy 7 Minor metalled rural and small roads which include carriageways overgrown by vegetation. They serve a very limited number of properties or provide access to agricultural land. They include gated roads and restricted access roads.	**Minor Roads** Little used roads serving very limited numbers of properties. They are locally defined.
Hierarchy 8 The remaining unclassified roads, which although we are liable for in terms of maintenance are un-metalled.	**Minor Roads** Little used roads serving very limited numbers of properties. They are locally defined.

4.3.2. Assignment of a carriageway to a particular hierarchy takes the following issues into consideration:

- character and volume of traffic
- current usage and effect of proposed development works
- routes to important local facilities and to the strategic network (for more information, please refer to the Winter Service Plan)
- designation as a traffic sensitive route
- accident and other risk assessment
- potential for use as a diversion route
- special characteristic of certain assets, for example, historic structures
- access to schools, hospitals and medical centres
- vulnerable users or people with special needs, elderly people's homes etc
- ceremonial routes and special events

4.4. Footway and Cycleway Hierarchy

4.4.1. Footway hierarchy is determined by functionality and scale of use. Table 2 sets out our local hierarchies.

Table 2

Our Local Standard	National Standard
Hierarchy 1 Footways in the main shopping street of the urban areas of towns Pedestrianised shopping streets in the urban areas of towns listed in the structure plan. Note: Hierarchy 1 status will not be extended beyond the main shopping street area merely because there are other shops or a proliferation of public buildings etc. outside the main shopping centre.	**Primary Walking Routes** Busy urban shopping and business areas and main pedestrian routes.
Hierarchy 2 Footways along main pedestrian routes just outside the main shopping area but within the central areas of towns listed in the structure plan. Local shopping streets in settlements not listed in the structure plan where there is a linear shopping development to 10 retails units or more within a 100m length.	**Secondary Walking Routes** Medium usage routes through local areas feeding into primary routes, local shopping centres etc.

Our Local Standard	National Standard
Footways remote from the carriageway linking main shopping streets (hierarchy 1) to other areas, for example, pedestrian access to car park etc.	
Hierarchy 3 Linking local access footways through urban areas and busy rural footways.	**Link Footways** Linking local access footways through urban areas and busy rural footways.
Hierarchy 4 Footways associated with low usage, for example estate roads to the main routes, cul-de-sacs, adjacent to local access roads and rural footways between villages.	**Local Access Footways** Footways associated with low usage, short estate roads to the main routes and cul-de-sacs.

4.4.2. Assignment of a footway to a hierarchy takes the following issues into consideration:

- pedestrian volume
- designation as a traffic sensitive pedestrian route
- current usage and proposed usage
- contribution to the quality of public space and streetscene
- age and distribution of the population, proximity of schools or other establishments attracting higher than normal numbers of pedestrians
- accident and other risk assessment
- character and traffic use of adjoining carriageway

4.4.3. Some Public Rights of Way (PROW) may be metalled and within, or on the fringe, of urban areas. To recognise users' requirements for consistency, these are considered for maintenance consistent with a similar footway and shall be incorporated in the footway hierarchy, irrespective of their designation.

4.4.4. Cycleways will be maintained and inspected on the same level as the linking footway hierarchy or the adjacent carriageway hierarchy. The highest hierarchy will always be chosen, as part of the risk-based approach.

4.4.5. The limited amount of cycleway asset not linked with a footway asset, or an adjacent carriageway asset will be categorised based on use within the asset management database and maintained and/or inspected accordingly.

4.5. Lifecycle Planning

4.5.1. The objectives of lifecycle planning are stated by the UK Roads Leadership Group in the Highway Infrastructure Asset Management Guidance as:

- identify long term investment for highway infrastructure assets and develop an appropriate maintenance strategy
- support decision making, the case for investing in maintenance activities and demonstrate the impact of different funding scenarios
- predict future performance of highway infrastructure assets for different levels of investment and different maintenance strategies

4.5.2. Lifecycle planning has been undertaken as part of the development of the Highways Infrastructure Asset Management Strategy and provides an outline of the long term plans and funding requirements for the key asset groups (carriageways, footways, structures, street lighting, signals, drainage and arboriculture) to maintain the required levels of service at the lowest whole life cost.

4.5.3. We have undertaken considerable investment in systems and surveys to collect and manage inventory and condition information on the carriageway and this data is utilised to:

- assess the long-term funding requirements for the maintenance of the network
- assess priorities for required maintenance
- develop the programme of maintenance schemes
- design detailed treatments for the H1 and H2 network

4.5.4. We have reviewed and evaluated various options to assist with lifecycle planning. Following detailed evaluation of options, we decided to build upon our existing systems and processes for deterioration and budget modelling which are also utilised for scheme identification, evaluation and prioritisation.

4.5.5. Building on past experience of in-house deterioration modelling, and following the principles of the HMEP Toolkit and other lifecycle planning options, current and historic SCANNER and CVI condition data was used to develop local deterioration curves for all carriageway classes. For more information, please go to Volume 2, Section 6 or the Highways Infrastructure Asset Management Strategy. Appendix C of this Plan further highlights the factors that are considered for future maintenance, in line with the Code of Practice.

4.6. Road/Rail Incursion

4.6.1. We shall work with relevant organisations to identify road/rail interfaces where a risk of incursion of road and pedestrian traffic onto a railway is present.

4.6.2. We shall ensure that appropriate warning signs on the approaches to road/rail interfaces are placed and maintained such that they are clearly visible to highway users.

5. Asset Management Database

5.1. Management Systems, Recording and Monitoring of Information

5.1.1. All records and information that we maintain will be accurately and effectively managed.

5.1.2. Various Highways Guidance Documents (HGD's), detail the internal procedures that will be adhered to in order to ensure the effective management of records relevant to highway maintenance.

5.1.3. The Quality Management System (QMS) has been implemented for the effective management of documents and records, which organises areas to compliment the layout of our highways organisational structure and contains links to other areas, HGDs and Health and Safety Codes of Practice.

5.1.4. We have a legal duty to maintain an up-to-date asset register. This records service requests, complaints, reports or information from users and other third parties. These may require immediate action, special inspection, or influence future inspection or monitoring arrangements. The nature of response, including where no response is required, is recorded. All inspections record as a matter of course: time and the name of the person conducting the inspection.

5.1.5. The inspection, assessment and recording regime is reviewed at intervals to consider:

- changes in network characteristics and use
- completeness and effectiveness of data collected
- effectiveness of data analysis
- the need for changes to the inspection regime derived from risk assessment

5.1.6. The frequency of reviews should regard the extent and nature of changing circumstances. Other factors which will influence the frequency of review include the following:

- ensuring compliance with legal obligations
- measuring network serviceability and condition performance
- seeking continuous improvement
- monitoring service delivery arrangements

5.1.7. For the purposes of robust asset management, we use the Confirm asset management system as a detailed highway asset register and database to establish a cost effective and adequate maintenance regime. The system is also used to record inventories of asset types for which we have responsibility.

5.1.8. Managing the safety and wide range of other risks associated with the delivery of highway infrastructure maintenance requires effective and co-ordinated information systems. The Confirm system includes all user contact information, records of inspection and condition and records of all maintenance activity.

5.1.9. The efficiency, accuracy and quality of information and records is crucial to the effective management of the service.

5.1.10. As the Confirm system holds sensitive and personally identifiable information, a security minded approach, appropriate to the level of risk, has been adopted in relation to the capture, creation, processing, storage, distribution and use of relevant data and information in accordance with the Data Protection Act. This approach is covered by our Information Assurance Policy.

5.1.11. All information obtained from inspections and surveys, together with the nature of response, including nil returns, shall be recorded consistently to facilitate analysis. Such analysis enables the data from inspections and surveys to be reviewed independently, but also in conjunction with other information to enable a holistic view to be taken of likely future maintenance need, asset condition and trends related to network characteristics and use.

5.2. Network Inventory

5.2.1. The majority of our highways network assets are recorded in detail in Confirm. Asset locations can be viewed using the embedded mapping, and they are also published out for viewing in other systems such as Location Centre and QGIS Geographical Information System (GIS). Tree information is stored in TreeWise and more detailed asset information for Traffic Signals is contained in IMTRAC.

5.2.2. Definitive maps and statements for PROW are kept, forming the legal record of the position and status of PROW.

5.3. Information Management

5.3.1. Appropriate and well managed data allows us to make good evidence-based decisions regarding budgets and service delivery, assists in planning future delivery of services to ensure best value and to ensure we meet national requirements to provide information returns. Our Data Management Strategy outlines our how we manage, store, use share and protect our data. approach towards security reviews and additional information management which keeps our records of assets up-to-date and secure.

5.3.2. Records of construction and maintenance treatments are kept to inform lifecycle plans. Information on mobile electronic devices used by highways officers in the field is used to support their decision making and reporting of asset condition and defects in real time.

5.3.3. As part of our digital journey, Technical Services Partnership (TSP) as part of our wider highways service, have chosen to embark on a strategy of Building/Better Information Management (BIM) which includes working towards an ISO 19650 compliant approach to information management. This includes the processes, procedures and support in change that this requires.

5.3.4. ISO 19650 standards replace all previous information management standards such as PAS 1192. Adhering and complying with this suite of documentation allows for a more organised structure within the production of our data which will not only benefit the design and construction of our roads, highways and assets but also, and more importantly benefit the operation, maintenance and legacy of our asset data for the generations to come.

5.3.5. A key component of this is the provision of a Common Data Environment (CDE) for project and portfolio delivery. This includes the implementation of ProjectWise, a bespoke construction focused piece of software which helps facilitate compliance and includes managed workflows and an asset information lead solution.

5.3.6. A cloud based CDE also gives us the ability to handle the large datasets we see becoming more common in the delivery of our portfolio of work. This includes but is not limited to documents and video records such as Vaisala RoadAI. Also, construction drawings and 3D models created by our teams utilising design tools such as Bentley OpenRoads.

5.3.7. Whilst this strategy starts within TSP the intention is to roll out this strategy to all aspects of data management within our highways service which could have a wider reach. For example, the benefits of one of our partners providing information in an agreed format will allow the transfer of data and its utilisation to provide benefits to all those connected with the asset data.

6. Risk-Based Approach

6.1. Principles and Considerations

6.1.1. Management of highway infrastructure maintenance, including setting policy, strategy and levels of service, establishment of inspection and condition assessment regimes, determining priorities and programmes, procuring the service and the management of all associated data and information shall be undertaken against a clear understanding and assessment of the risks and consequences involved.

6.1.2. The principle of this plan is that we have generated a risk-based approach in accordance with local needs (including safety), priorities and affordability. This is consistent with ISO 55000, which states that “asset management translates the organisation’s objectives into asset-related decisions, plans and activities, using a risk-based approach.”

6.1.3. We have adopted a risk-based approach and a risk management regime for all aspects of highway maintenance policy. This includes investment, setting levels of service, operations, including safety and service and condition inspections, and determining repair priorities and replacement programmes. This approach is undertaken against a clear and comprehensive understanding and assessment of the likelihood of asset failure and the consequences involved.

6.1.4. When determining the balance between structural, preventative and reactive maintenance, the principle that "prevention is better than cure" has been adopted.

6.2. Developing the Risk-Based Approach

6.2.1. Eight elements are considered key when developing a robust risk-based approach. These are evidenced below:

Elements	Our Evidence
Alignment with our corporate objectives, legislative requirements, and corporate approach to risk	We continue to adhere to our legal requirements outlined within the various acts shown within Appendix E of this plan, whilst aligning our risk-based approach with our corporate Risk Management Strategy.
An understanding of risk in a highways service	We have taken the necessary steps to fluidly integrate risk-elements within the key facets of the highways service in terms of defect response, a risk-based inspection regime for all assets and our lifecycle planning based on prioritisation through data-analysis.
An understanding of the potential risks and their likely significance	The Asset Management Strategy, through the lifecycle planning process, demonstrates a clear understanding of the needs of our assets. Continual data-gathering, risk-based inspections and analysis provides us with an understanding of the risks for each asset, allowing our highways service to make informed decisions.
An understanding of the various assets comprising the highway network	We maintain and update an inventory category through our asset management database system which highlights the function, criticality, sensitivity, characteristics and use of the assets for which we are responsible.
The establishment of hierarchies and levels of service with appropriate funding	Hierarchies have been established and are outlined in Section 4 of this Volume.

Elements	Our Evidence
The establishment and subsequent implementation of agreed levels of service	The levels of service are outlined in our Highways Infrastructure Asset Management Policy. Its subsequent measures, funding regimes and lifecycle planning are outlined in the Highways Infrastructure Asset Management Strategy. Finally, the operational elements carrying out the levels of service and measures are explained within this HIAMP.
Competencies	Those involved in managing, developing and implementing the risk-based approach must meet our satisfaction and competence as the highway authority. Clear guidance, mentoring and training are provided to employees including establishment of the risk-based approach itself and practical implementation. Training recognises the possibility of legal challenge to decisions. The Engineering Council, as the UK regulatory body for the engineering profession, sets and maintains standards of professional competence and ethics that govern the award and retention of the titles Chartered Engineers (CEng), Incorporated Engineers (IEng) and Engineering Technicians (EngTech).
Regular evidence-based reviews.	We constantly review our data, systems, policies, hierarchies and inspection frequencies to strive towards further efficiencies through the implementation of the risk-based approach. This approach ranges from large-scale data reviews to individual hierarchy changes which will need to be evidenced and logged within our asset database.

6.3. Inspections and Surveys

6.3.1. Establishment of an effective regime of inspection, survey and recording is the most crucial component of highway infrastructure maintenance. The characteristics of this regime, including types and frequency of inspection, items to be recorded and nature of response have been defined following an assessment of the relative risks associated with potential circumstances of location, agreed level of service and condition. These are set in the context of the Highways Infrastructure Asset Management Strategy.

6.3.2. The inspection, survey and recording regime provides the basic information for addressing the core objectives of highway maintenance, namely:

- network safety
- network serviceability

6.3.3. It can provide the basic condition data for the development of maintenance programmes.

6.3.4. Every volume within this plan will outline its inspection regime for those particular assets, with all various categories of inspection discussed and a risk-based approach to these inspections outlined. We undertake safety inspections for our various asset groups using a risk-based approach wherever reasonably practicable.

6.4. Defect Reporting and Repair

6.4.1. All defects observed during safety inspections that provide a risk to users, as defined throughout this document, are recorded and the level of response determined on the basis of risk assessment. The degree of deficiency in highway elements is crucial in determining the nature and speed of response.

6.4.2. Defects which are considered to require urgent attention shall be made safe in accordance with the maximum response times as set out in detail in Appendix B of this plan.

6.4.3. Defects that do not represent an immediate or imminent hazard or risk of short-term structural deterioration may have future safety implications, although of far less significance than those which are considered to require urgent attention. They are more likely to have serviceability or sustainability implications. If repairs are to be undertaken, these are likely to be within a planned programme of works with their priority determined by risk assessment. Access requirements, other works on the network, traffic levels, and the desirability of minimising traffic management, shall also be considered as part of the response.

6.4.4. We have changed our approach to the reactive service by empowering the contractor to carry out self-identification and defect repair for faults that are at intervention level in accordance with Appendix B and within 30m of an instructed repair. The change in approach has been introduced so that defects that have formed between safety inspection and repair will be rectified at the same time as the initial fault. Taking this approach ensures that we have introduced an additional level of defect identification and rectification.

- potholes and surface defects
- road markings
- signs
- street furniture

6.5. Reporting by the Public

6.5.1. Feedback from members of the public is an increasing source of data on the condition of all aspects of the highway network, with the use of smartphones and other personal mobile technology providing details such as location, time and imagery.

6.5.2. This data is integrated with the prioritisation calculations we undertake for the carriageway and footway forward programmes, alongside dedicated inspection and survey data as outlined in this document.

6.5.3. We now capture this information through; Fix My Street, our website, our Customer Service Centre (CSC) and general enquiry forms. These perceived faults on the network from the public are automatically logged within the Confirm asset management system, where they will be investigated by a designated highways officer or out of hours duty officer.

6.5.4. Members of the public can also report other highway issues, such as highway enforcement including obstruction in the highway through the CSC.

7. Financial Management, Priorities and Programming

7.1. Financing of Highway Maintenance

7.1.1. Financial constraints, lifecycle planning, making the case for investment and investment strategy are all dealt with in the Highways Infrastructure Asset Management Strategy.

7.2. Priorities and Programming

7.2.1. Our highway network will be viewed as a whole when developing priorities, rather than as a series of asset groups such as carriageways, footways, structures, lighting, drainage.

7.2.2. We shall seek to share and coordinate short- and long-term programmes of work with others undertaking works on the highway for several years in advance. A prioritised forward works programme for a rolling period of three to five years has been developed and is updated regularly. For more information, please go the programming section of each volume.

7.3. Climate Change

7.3.1. In order for the highway network to be resilient in the face of a changing climate, we need to take action to adapt our policies and standards to help reduce CO2 emissions from our activities, and to minimise the disruption and costs caused by climate change in the future.

7.3.2. It is predicted that the impacts of climate change in the UK will be:

- increased annual average temperatures
- longer, hotter, drier summers
- milder, wetter winters
- soils will become drier on average
- more frequent heavy and extreme rainfall, and
- potentially more extreme winds and storms.

7.3.3. These changes in climate could have significant impacts on the construction and maintenance of highways including roads and footways. For example:

- drier and hotter summers will lead to more incidences of pavement deterioration and subsidence
- wetter winters and more frequent heavy rainfall will result in more frequent incidences of flooding, particularly in low lying areas and floodplains. This will have an impact on pavement performance and resilience, drainage capacity and condition, utilities and highways structures (such as bridges, culverts, road signs and street lighting)
- predictions of increased storms and extreme winds may have safety impacts and will have the potential to cause damage to structures and trees on or close to the highway
- changes to the growing season as a result of warmer year-round temperatures will mean that plants will grow faster and for longer periods. New plant species may also start to thrive. This will lead to the need for more intensive maintenance programmes to prevent vegetation intrusion on the highway and 'sight line' impairments due to the increased growth of the soft estate (such as verges). Increased vegetation may also pose problems for drainage through gully blockages and erosion.

7.3.4. In order to adapt to the effects of climate change effectively and efficiently, we are identifying the level at which different parts of the network are vulnerable and most in need of attention. Consequently, many of the responses identified as potentially being the most effective involve undertaking a risk assessment and/or asset review. Undertaking this work helps ensure that we have a clear indication of the location, condition and vulnerabilities of our assets. A more targeted programme of action and improvement can then be developed.

7.3.5. By acting now and identifying the work that needs to be carried out (including monitoring, maintenance, strengthening, reconstruction etc.), the network will be more resilient to the effects of climate change. This will help reduce the cost and inconvenience caused by any necessary emergency or reactive work required in the future.

Volume 2 - Highways

1. Introduction

1.1. Context of Volume 2

1.1.1. Volume 2 of the HIAMP covers specific issues and themes regarding highways themselves, and includes the following asset types:

- carriageways
- footways
- public rights of way
- cycleways
- embankments and cuttings
- landscaped areas and trees
- fences and barriers
- traffic signs and bollards
- road markings and studs

1.1.2. The overarching principles and common themes of maintaining highway infrastructure are covered within Volume 1. Asset specific guidance for drainage, structures, street lighting and trees are covered in Volume 3, Volume 4, Volume 5 and Volume 6 respectively.

2. Legal Framework

2.1. Statutory Obligations

2.1.1. General duties and powers are dealt with in Volume 1 of the plan. This section contains information on duties and powers specifically related to highways.

2.2. Highway Specific Legal Considerations

2.2.1. The Highways Act 1980 sets out the main duties of Highway Authorities in England and Wales. Section 41 imposes a duty to maintain highways maintainable at public expense.

2.2.2. Section 58 provides for a defence against action relating to alleged failure to maintain on grounds that we have taken such care as in all the circumstances was reasonably required to secure that the part of the highway in question was not dangerous for traffic.

2.2.3. Additional Acts relevant to the HIAMP are outlined in Appendix E of this Plan.

2.3. Winter Service

2.3.1. Details of the Winter Service and its legal requirements that we undertake are outlined in a separate document named the Winter Service Plan, approved annually by Members. This document should be read as an annex to the HIAMP.

3. Asset Management Information

3.1. Principles and Considerations

3.1.1. Asset data management is an essential part of the Highways Infrastructure Asset Management Strategy and relies on a specific asset management system to enable this. A highway asset management system is essential to deliver an effective and efficient approach to asset management. We currently use the Confirm asset management system to cover all of the asset types outlined in Section 1.1.1 of this volume, with the actual data collected aligning to our Highways Infrastructure Asset Management Strategy.

3.1.2. The UKPMS (National standard for Pavement System) accredited Confirm asset management system consists of a specific asset register and database, outlining details regarding our carriageways, footways, cycleways, structures, street lights, drainage assets, traffic signals and any additional street furniture that is our responsibility to maintain.

3.1.3. The Confirm asset management system enables us to undertake multiple activities such as:

- loading network, inventory and condition data, including data collected by:
  - Visual surveys (CVI)
  - SCANNER
  - Footway Network Surveys (FNS)
  - SCRIM
  - Deflectograph
- data processing
- condition reporting
- financial reporting to support asset management, including:
  - inventory reports
  - accumulated and annual depreciation of carriageways
  - supporting information for footways, cycletracks and paved verges

3.1.4. We also use AI systems to support our understanding of network condition and assist with maintenance scheme identification and prioritisation.

3.1.5. HMEP (Highways Maintenance Efficiency Programme) is a sector-led transformation programme. It is designed to maximise returns from highways investment and help to improve efficiency and effectiveness of the local highways sector which it is aimed at. HMEP has developed a series of products to inform highways authorities of examples of best practice and recommendations which should lead to an improved highway maintenance service and better value for money for taxpayers. We use these tools of best practice to shape our organisation and our methods for delivering the service.

4. Asset Condition

4.1. Introduction

4.1.1. This section deals with asset condition for each element of the network and its contribution to safety, serviceability and sustainability. For more information, please go to Appendix A of this Plan.

4.1.2. This section does not deal with the Safety and Service Inspections undertaken by the Highways Service. We undertake Condition Inspections and Safety and Service Inspections separately. More information on the Safety and Service Inspections can be found in Section 5 of this Volume.

4.2. Principles and Considerations

4.2.1. Each element of the network can have different condition requirements, a minimum one to satisfy the need for safety, and higher ones, designed to meet local requirements for serviceability or sustainability, in line with the Highways Infrastructure Asset Management Strategy. A good asset management approach will entail both reactive and proactive measures designed to maintain the viability of the network. Our reactive service, programming and various safety, service and conditions inspections all serve as an accurate method to maintain a record of the condition of the asset and enables us to accurately plan the best course of action each time.

4.2.2. It is important to recognise that all information recorded, even if not intended for network safety purposes, may have consequential implications for safety.

4.2.3. As outlined in Volume 1, Section 4.1.4, the level of customer service is generally more relevant when applied to the whole of the network. It is therefore not dealt with by this plan under each of the individual elements in the following sections.

4.3. Condition Surveys – Carriageways, Footways and Cycleways

4.3.1. The most significant financial investments in highway maintenance will be in repairing, reconditioning and reconstructing carriageways, footways and cycleways. Condition surveys identify the current condition of the network, and from this condition both long-term and short-term maintenance funding decisions can be made. Repeatable condition

surveys allow trend analysis to be used to confirm the original decisions or allow for changes as a result of the changing network condition and inform lifecycle planning.

4.3.2. Frequencies of carriageway, footway and cycleway condition inspections are derived using the principles outlined in Volume 1, Section 4 of this plan (categorising the network into an appropriate hierarchy) and Section 6 (covering risk-based approach for inspections).

4.3.3. There are a number of types of survey, each providing information from a differing perspective, and which in combination can provide a comprehensive picture of the condition of the asset. We undertake a comprehensive regime of carriageway network level surveys at the following scope and frequencies to assist with:

- maintenance scheme identification and planning
- performance monitoring
- detailed scheme design

4.3.4. Our Data Insight Team are responsible for publishing map layers showing the results of SCANNER, CVI, Deflectograph, SCRIM and FNS surveys to assist targeting and prioritising maintenance.

Survey method	Scope	Inspection Frequency
SCANNER (Surface Condition Assessment of the National Network of Roads)	Traffic speed surveys that collect data on transverse and longitudinal profiles, texture and cracking of carriageways. SCANNER surveys are mandatory requirement for reporting of Data Topic 130-01 (formerly NI 168/ BVPI 223), "Condition of principal roads" and Data Topic 130-02 (formerly NI 169/BVPI 224a) "Condition of non-principal classified roads". These surveys are undertaken by a specialist vehicle at traffic speed. The information is both reliable and repeatable giving a consistent survey.	All the MRN, Hierarchy 1, 2 and 3 network in a single direction each year. 50% hierarchy 4 network in one direction each year.
CVI (Coarse Visual Inspection)	CVI is carried out from a slow-moving vehicle. CVI survey data is collected using UKPMS accredited data capture software. Inspectors are trained in house at Lincs Laboratory in accordance with the UKPMS Visual Survey Manual.	All the MRN, Hierarchy 1,2 and 3 network in a single direction each year. 50% Hierarchy 4 network in one direction each year. 25% of the Unclassified Network each year.

Survey method	Scope	Inspection Frequency
SCRIM (Sideway-force Coefficient Routine Investigation Machine)	SCRIM results are used to identify lengths of carriageway with poor skidding resistance. SCRIM surveys are carried out in accordance with national good practice.	33% of the MRN, Hierarchy 1 and 2 Network each year.
Deflectograph (Structural Condition Surveys)	These surveys measure the structural integrity of the carriageway. The results provide an estimate of its residual life and are a crucial component when assessing structural maintenance requirements.	20% of the MRN, Hierarchy 1 and 2 Network each year.
FNS (Footway Network Surveys)	The condition of footways is monitored by means of FNS (Footway Network Surveys).	20% of the Network each year.

4.3.5. SCANNER surveys collect condition information and were introduced with the aim of providing both reliable and repeatable information, for the assessment of carriageway condition. They can support national requirements for reporting where applicable.

4.3.6. CVI surveys are a fast, cost-effective survey that enables authorities to cover large parts of their road network on a regular basis. Rather than recording detailed measurements of individual defects, the survey identifies and categorises lengths of features having generally consistent defectiveness.

4.3.7. Network surveys such as SCANNER and CVI provide regular whole network coverage and are used to target more detailed investigations of provisional treatments, using more detailed project level surveys.

4.3.8. The maintenance of adequate levels of skidding resistance on carriageways, footways and cycleways is an important aspect of highway maintenance, and one that contributes significantly to network safety, particularly for cyclists, motorcyclists and equestrians.

4.3.9. We undertake routine skid resistance testing on the Hierarchy MRN, 1 and 2 Network using the SCRIM machine. Surveys are undertaken on a three-year cycle using the single survey method with benchmark sites.

4.3.10. The Deflectograph is a survey vehicle that gathers information used to assess the structural condition of the whole carriageway, particularly on local authority roads which are not deemed long-life. A long-life carriageway is defined as a carriageway with over 300mm of bituminous materials and a low deflection.

4.3.11. The Footway Network Survey (FNS) is intended to provide a cost effective, efficient and consistent approach to footway surveys. It is a continuous survey, carried out by walking the footway, recording one of four condition levels:

- as new
- aesthetically impaired
- functionally impaired
- structurally unsound

4.3.12. Securing continuous improvement in the safety and serviceability of cycleways, in particular network integrity, is a necessary component for encouraging cycling as an alternative to the car.

4.3.13. Dedicated cycleways are recorded within the footway asset database to be condition inspected at the same intervals. Shared use footway/cycleway assets are recorded as footways. Most of the cycleway network is shared use.

4.3.14. Specific cycle track provision within the county has increased significantly since the implementation of the local transport plan through the community travel zone initiative and rural priority initiative. Therefore, the majority of cycling provision is of relatively new stock and maintenance is yet to become a significant issue. However, it is recognised that maintenance standards for these facilities will be established quickly in order to provide guidance to local highways staff and to ascertain the financial commitment, in terms of the future maintenance costs.

4.4. Condition of Public Rights of Way (PROW)

4.4.1. The condition of PROW can contribute to the core objectives and to the broader quality of life objectives associated with leisure and recreation.

4.4.2. The requirements for PROW are determined as part of our Countryside Access and Rights of Way Improvement Plan (ROWIP), in consultation with the Local Access Forum established by the Countryside and Rights of Way Act 2000. The document is currently undergoing revision.

4.4.3. The current ROWIP has been implemented under four themes, each with a strategic aim and supporting our wider social objectives including the aims of the Local Transport Plan:

- sustainable transport - strategic aim to increase the use of the network for sustainable transport and utility trips
- health and well-being - strategic aim to make it easier for people to incorporate exercise into their daily lives and lead healthier lifestyles
- rural economy and tourism - strategic aim to support local businesses and tourism through access improvements
- social issues - strategic aim to enable more people to enjoy walking and riding

4.4.4. We are currently reviewing how asset data is collected and managed and in due course an asset management plan focussing on PROW will be published.

4.4.5. The Public Rights of Way & Access team follows an area-based inspection regime (for more information, please go to Section 5.9 of this Volume). It further prioritises schemes and individual pieces of work representing a risk to health and safety, using the following methods:

- priority 1 – routes that we actively promote (for example, viking way, bridle trails, recreational walk routes)
- priority 2 – routes that are known to be well used, predominantly close to settlements or routes promoted by other bodies and we specifically endorse
- priority 3 – all other available routes
- priority 4 – routes that could only be made available by the significant investment of capital resources or requiring extensive legal work to resolve alignments and obstructions

Priority	Rights of Way Act Infringements (Ploughing and Cropping)	Grass Cutting and Vegetation Clearance (Subject to cyclical programme)	Path Furniture Repair and Minor Obstructions	New or Replacement Bridges	Essential Surfacing Works
1	Three Months	Two Months	Three Months	Subject to size, location and resource availability	Works subject to finance and availability of workforce
2	Four Months	Two Months	Six Months	Subject to size, location and resource availability	Works subject to finance and availability of workforce
3	Works subject to finance and availability of workforce	Works subject to finance and availability of workforce	Works subject to finance and availability of workforce	Subject to size, location and resource availability	Works subject to finance and availability of workforce
4	Works only to be undertaken when major issues are resolved.	Works only to be undertaken when major issues are resolved.	Works only to be undertaken when major issues are resolved.	Works only to be undertaken when major issues are resolved.	Works only to be undertaken when major issues are resolved.

Any report which is a health and safety consideration will be dealt with in a timescale dependent on an appropriate risk analysis

4.4.6. These timescales are for guidance only and there may be times when it may not be possible to meet these service standards. In such instances we will inform respondents as

to the reasons why and what action is being taken. One such example could be where a request is made that vegetation and hedging needs clearing from the line of a right of way. Bearing in mind our obligations concerning protecting biodiversity, stemming from the Natural Environment and Rural Communities Act 2006, the Wildlife and Countryside Act 1981and various other wildlife legislation, it may be prudent to defer works until a more appropriate time providing that the route is not wholly obstructed.

4.5. Condition of Embankments and Cuttings

4.5.1. Slips and rock-falls happen rarely. However, we have records of suspect locations and have established an inspection and maintenance regime based on local risk assessments. Our scheme is based on National Highways inspection regime which inspects cuttings and embankments over five metres in height and lower ones which have been identified as suspect. The embankments and cuttings which have been identified as suspect will be inspected once a year. All inspections will be undertaken by a qualified geotechnical engineer or geologist with experience of slope instability.

4.5.2. The following standards are used for embankments and cuttings (condition inspections):

I. inspections to be based on specialist geotechnical advice

II. inspections to take place during winter months and after periods of heavy rain whenever possible. This is the worst time of year for instability, the easiest for inspection and there is little foliage to hide evidence

III. we keep a record of locations prone to rock-falls and slips

IV. these locations and others identified by local highways managers as being suspect are inspected once a year

V. all inspections will be undertaken by a qualified geotechnical engineer or geologist with experience of slope stability

4.5.3. The probability of failure will be affected by soil conditions and drainage. The impact of embankment or cutting failure will generally be high in all situations, but particularly so on important high-speed links, or where dwellings could be affected. In such circumstances, the condition of embankments and cuttings shall be subject to a robust regime of inspection.

4.5.4. Slips and rock-falls from embankments and cuttings are relatively infrequent but the frequency and severity of such events may be affected by climatic change. We have records of relevant locations and have established an inspection and maintenance regime based on a local risk assessment.

4.6. Condition of Verges

Grass Cutting

4.6.1. We carry out grass cutting in rural areas for the MRN network and hierarchies one to seven, three times a year. Our main priority for grass cutting is to maintain visibility and

safety at junctions and bends, in addition we aim provide a strip either side of the footway wherever possible within the highway.

4.6.2. In built up (urban) areas, we work with the district and parish councils to undertake 3 cuts per year of the highway verge. A list of those areas cut by district and parish councils is available on our website.

4.6.3. Vegetation on highway verges should not restrict visibility at junctions, access points and bends. Sight lines and minimum stopping distance will be kept clear, and signs, lights, and markers posts will not be obstructed.

4.6.4. Good practice suggests that verge (flail) cuts are undertaken to control the extent of self-set bushes and tree growth. The exception to the above is where Roadside Nature Reserves are established. Lincolnshire has 63 Roadside Nature Reserves, some of which are sites of specific scientific interests where the flora and fauna are of a particular conservation value. Under an agreement with the Lincolnshire Wildlife Trust, the Trust is responsible for all environmental maintenance at these sites, apart from safety mowing.

4.6.5. Edge maintenance or "siding" of carriageways, footways and cycleway is occasionally necessary to prevent encroachment of grass and reduction of width. This work will be carried out infrequently, preferably during the autumn. On un-kerbed roads, siding will be carried out in advance of footway surface treatment, where necessary.

4.6.6. This plan provides for flexibility in applying judgment in urban and rural areas, and this shall take account of the character of the area rather than be determined solely by speed limit considerations.

Weed Treatment

4.6.7. The growth of weeds in footways and cycleways, hardened verges, central reserves filter drains and along kerb lines may cause structural damage, drainage issues and the general perception of such growth is that it is untidy. In some circumstances weeds have been considered to have implications for pedestrian safety. Weed growth is also a source of significant community interest and service requests. Weed treatment is therefore undertaken according to traffic and pedestrian usage and to a level of usage that takes account of local concerns.

4.6.8. We carry out total weed control operations on areas of paving and hard standings, kerb channels, the back edge of carriageways and footways abutting walls, around street tree bases and around street furniture. Weed spraying covers a total of 4600 km of kerbs and is undertaken bi-annually.

4.6.9. Specialist environmental guidance is adhered to regarding the materials used for weed spraying and the frequency of application, with regards to levels of usage. Noxious weeds shall be dealt with on an ad hoc basis. All weed spraying is carried out in accordance with the Control of Pesticides Regulations 1986. Only approved pesticides are used, these are chemicals listed in the Plant Protection Products (Sustainable Use Regulations) 2012.

4.6.10. The most common specified weed under the Weeds Act 1959 is Common Ragwort. Section 14 of the Wildlife and Countryside Protection Act 1981 makes it an offence, liable to a fine, to plant or otherwise cause to grow in the wild, certain specified weeds. It may be a defence to prove that all reasonable steps were taken to prevent the plants growing in the wild. Specified weeds under the Wildlife and Countryside Act 1981 are Giant Hogweed, Himalayan Balsam and Japanese Knotweed.

4.6.11. Our policy is to carry out selective weed control operations on highway verges to control the growth of injurious, noxious and controlled weeds including other invasive vegetation. It is important to note that The Noxious Weeds Act 1959 does not seek to eradicate ragwort, but only seeks to control it where it poses a high risk to grazing animals, feed and forage production and we must take action to control the spread of ragwort.

4.7. Condition of Non-illuminated Traffic Signs and Bollards

4.7.1. The impact of failure will be greater for regulatory signs than for warning signs, the impact of which will be greater than direction signs. The probability of sign failure is generally low, although it will be higher in areas subject to vandalism. However, the probability of sign illegibility, defectiveness or clutter is much higher.

4.7.2. We carry out both general route reviews and specified whole route reviews, reviewing all sign assets on a particular route or area with regard to legality, condition and ownership.

4.7.3. It is good practice to review damaged or missing signs before replacement to ensure there is still a requirement for the sign and the design is still lawful.

4.7.4. We are responsible for ensuring that any safety issues with regards to any signs are resolved in line with our risk-based response times to reactive maintenance.

4.7.5. Sign cleaning will be undertaken in accordance with schedules and frequencies defined in the Highway Works Term Contract. This entails once a year for the signs on the MRN, Hierarchy 1 and Hierarchy 2 carriageway network and four times a year for bollards. All others as required.

4.7.6. Although in many circumstances illuminated signs are essential, the use of high-reflectivity, non-illuminated signs can bring benefits in terms of sustainability. This shall be a consideration where legally permitted, both for new signs and on replacements, and shall also be considered during any network integrity inspections. Lincolnshire Road Safety Partnership (LRSP) must be consulted with when existing lit signs are identified for possible de-illumination and removal, or replacement with a reflective sign assembly. An audit trail of conversations with LRSP regarding the removal of illumination from existing signs must be maintained and appropriately filed.

4.7.7. Heritage signs and milestones will be refurbished or will be replaced with same or similar whenever possible. This may be subject to third party funding depending on location and circumstances.

Condition Inspection	Frequency
General Condition	Part of the General Highways Inspection
Cleaning	Signs (including externally illuminated ones), marker posts and reflective bollards are cleaned once a year for strategic road network (MRN – H1-H2). All others are cleaned as required. Note: Any faults will be reported including any within 20m on each side of the road
Replacement and repair of damaged non-lit signs and bollards	Respond according to the degree of danger. In extreme cases this would be within two hours.

4.8. Condition of Road Markings and Studs

4.8.1. The general condition of road markings and studs will be inspected during the annual condition survey by divisional staff. An annual night-time survey to check reflectivity will be undertaken on hierarchy 1 and 2 roads and some designated hierarchy 3 roads. This survey will be undertaken between November and February and will include non-illuminated bollards.

4.8.2. Any anomalous results from the above surveys will be referred to Lincolnshire Laboratory where consideration will be given to further investigation. The results of the surveys will be maintained on a database.

4.8.3. Road marking will be prioritised for renewal based on the results of the condition inspections.

4.8.4. All mandatory road markings existing before resurfacing, patching or surface dressing shall be considered for replacement as soon as is reasonably practical:

- stop and give way markings shall be replaced within seven days
- other mandatory lines within 14 days
- all other markings and road studs within 28 days of completion of works

4.8.5. At all times when markings or studs are removed “No Road Marking” boards shall be displayed until all markings have been replaced. In addition, where “double line” systems have been removed “No Overtaking” boards shall be displayed.

4.8.6. There will be a preference toward bulk changes of road studs on all other routes prioritised in accordance with the condition inspection results. Bulk changes will reflect the type of use of a particular route and will start and finish at salient points on the route (for example, major junctions). Displaced road studs lying on the carriageway, hard shoulders or lay-bys, and loose studs if considered to be a hazard, are removed immediately if reasonably practicable.

4.8.7. A programme of works regarding markings and road studs is developed based on needs and priorities. We utilise artificial intelligence and safety and condition inspections to determine future programmes.

4.9. Condition of Traffic Signals, Pedestrian and Cycle Crossings

4.9.1. An annual inspection will be carried out and shall include the following items:

- signal lenses will be cleaned
- inspections of the physical condition of the controller and auxiliary equipment cabinets and other site hardware (poles, signal heads etc)
- earth testing

4.9.2. Full inspections for electrical safety will be carried out at intervals of six years. Guidance on aspects to be inspected and on defect criteria is given in TS101.

4.9.3. The priority objective is to provide and maintain all traffic signals, controlled pedestrian and cycle crossings to a high standard to ensure the safety of all road users and to ensure the efficient operation of the highway network.

4.9.4. The following frequencies will be used:

Condition Inspection	Method and Frequency
Scouting for illumination	Covered by Urban Traffic Control and Remote Monitoring Systems
HI Lamp changing	Bulk change every 12 months
Internal inspections and cleaning	At least annually or additionally when required
Checking of phasing	When a fault is suspected
Checking of alignment	Annually or when a fault is suspected
Mechanism	Annually or when a fault is suspected
External Cleansing	Every 12 months

4.10. User and Community Response

4.10.1. User and community responses can make a significant indirect contribution both to safety and serviceability by ensuring that service requests and complaints are dealt with appropriately and converted into actions. Adequate provision of information will also enable users to obtain better serviceability from the network. We engage with the NHT Public Satisfaction Survey and have robust options for dealing with service requests and

complaints involving a dedicated Customer Service Centre and FixMyStreet for online reporting.

4.10.2. To provide clarity, we have adopted dimensional definitions for potholes based on best practice as part of its maintenance policy. Our reactive maintenance works based on fixed response times, including those put forward by members of the public, outlined in Appendix B of this plan.

5. Safety and Service Inspections

5.1. Introduction

5.1.1. The general principles to be applied to inspections, assessment and recording are outlined in Volume 1, Section 5 of this plan. This section covers guidance for the Safety and Service inspections relating to highways assets. This section does not include details revolving around condition inspections, which can be found in Section 4 of this Volume.

5.1.2. In order to satisfy the statutory duties set out in the Highways Act 1980, we have put in place inspections to assess the highway network. The collection of inspection results is managed using Confirm Enterprise Infrastructure Management System using portable tablet computers and handheld devices with global positioning system (GPS).

5.1.3. We undertake Safety and Service inspections to accurately monitor the carriageway and footway network. The inspection schedules are route and area based. Results are uploaded and downloaded within the Confirm Enterprise Infrastructure Management System and stored within the asset management system.

5.2. Safety Inspections – General

5.2.1. Safety Inspections are designed to identify defects that are likely to create a safety issue to users of the network. Such defects will be made safe as soon as reasonably practicable, and in any case within the timescales detailed in Appendix B of this Plan. of this Plan.

5.2.2. We have determined the most appropriate way to undertake inspections in order to clearly observe any defects for each asset type. This may include inspections from a slow-moving vehicle or, in busy urban areas, and particularly when inspecting footways, it may be difficult to obtain the necessary level of accuracy from vehicle-based inspections and walking is used.

5.2.3. Frequencies of safety inspections are derived using the principles outlined in Volume 1, Section 4 of this plan (categorising the network into an appropriate hierarchy) and Section 6 (covering risk-based approach for inspections).

5.2.4. Routine Local Highway Inspections do not cover the following:

- condition inspections such as specialist engineering inspections (including Coarse Visual Inspection and Detailed Visual Inspection), machine inspections (for example, SCRIM and Deflectograph) and the Footway Network Survey
- streetworks inspections (under the New Roads and Street Works Act 1991)
- structures, safety barriers and traffic signals inspections
- development control inspections (section 278 and section 38 inspections)
- street lighting (including illuminated signs, and lit bollards) inspections
- ad-hoc inspections in response to specific problems or complaints

5.2.5. However, defects resulting from any of the above should be reported and dealt with under the appropriate procedure.

5.2.6. Service Inspections are designed primarily to establish programmes of routine maintenance tasks which, although they may be essential work, do not require urgent execution.

5.3. Highway Network Hierarchy

5.3.1. Each part of the highway network is assigned a hierarchy which relates to its importance for transportation and usage. Footway hierarchies are different from carriageway hierarchies. Therefore, most roads have a different hierarchy classification for the carriageway and footway. Public Rights of Way within built up areas that have been identified as having a metalled surface are categorised as link footways and are assigned the appropriate hierarchy and inspected as an integral part of the network.

5.3.2. The detailed definitions of each hierarchy classification are found within Volume 1, Section 4.

5.4. Inspection Frequencies

5.4.1. The inspection frequencies for Safety and Service inspections are as follows:

Carriageway	Footway	Inspections per annum
MRN, Hierarchy 1	Hierarchy 1	12
Hierarchy 2	Hierarchy 2	4
Hierarchy 3	Hierarchy 3 and slabbed/modular 4	4
Hierarchy 4, 5 and 6	Hierarchy 4 (excluding slabbed/modular)	1
Hierarchy 7	/	Once every three years

Carriageway	Footway	Inspections per annum
Hierarchy 8	/	Once every five years (unmetalled carriageways

Cycleways	Inspection requirements
Cycle Lane	Include with adjacent carriageway inspections
Cycle Track	As per Type 4 Footway
Shared Cycle/Pedestrian	Include with the adjacent footway inspections

Laybys	Inspection requirements
Type 1 – surfaced layby, either immediately adjoining the carriageway or segregated by a kerb line or physical barrier or grass/tree island	Include with adjacent carriageway inspections
Type 2 – where the layby is remote from the main carriageway, e.g. where the road has been realigned	In line with assigned hierarchy
Type 3 – unsurfaced layby	Include with adjacent carriageway inspections

5.4.2. For reasons of route efficiency hierarchy MRN, 1 and 2 carriageway inspections will be Route Based for example, the inspections will extend across the whole of a Local Highways Managers area.

5.4.3. All other inspections are Area Based i.e., they are a selection of carriageway and footway assets within a discrete maintenance area which satisfy the criteria of a given inspection schedule. In normal circumstances the inspecting officer will have routine maintenance responsibilities within the maintenance area. However, allocation of available staff resources will mean that this may not always be the case.

5.4.4. Service inspections will be carried as part of the Local Area Inspection for all hierarchies of carriageway and footway, combining with the safety inspections.

5.5. Inspection Schedules

5.5.1. To facilitate the efficient implementation of the inspection regime each carriageway and footway asset will be assigned to one of seven inspection schedules. In Line with the risk-based approach which outlines 'Where carriageway and footway hierarchies intersect, for example at all controlled crossings the higher inspection frequency takes precedence in

determining of inspection frequency, defect definition and responses. This principle also applies to intersections between carriageways and cycleways and between cycleways and footways.'

5.5.2. Where sections are identified as being impractical to inspect from a vehicle the inspections will be walked, irrespective of hierarchy. Where footway sections are identified as slabbed or modular the inspection will be walked, irrespective of whether it can be practically inspected from a vehicle.

5.5.3. Explanation of inspection schedules:

Numeric = frequency of inspection (for example, 12 per annum)

A = area based

D = driven

R = route based

W = walked

5.5.4. The inspection schedules are tabulated below:

Schedule	**Roadway Asset**	**Hierarchy**	**Inspection Frequency per annum**	**Comments**
12WA	Footway and Carriageway	MRN/1	12	No comments
12DR	Urban and rural carriageway and footway	MRN/1	12	No comments
4WA	Footway and Carriageway	2	4	No comments
4DR	Urban and rural carriageway and footway	2	4	No comments
4DA	Carriageway and footway	3	4	Includes hierarchy 4 slabbed or modular footways.
1WA	Footway	4	1	All footways not included in Schedules 12WA, 4WA, 4DR, 4DA and 12DR

Schedule	Roadway Asset	Hierarchy	Inspection Frequency per annum	Comments
1DA	Carriageway and footway	4, 5, 6	1	Excludes footways identified in Schedules 12WA, 4WA and 4DA.
1/3DA	Carriageway	7	Every three years	Driven if possible, else walked
1/5WA	Carriageway	8	Every five years	No comments

5.5.5. The annual programme of inspections should be created to ensure that all assets are inspected at the frequency required and to allow the resource available to respond within the agreed timescale. The schedules which have an inspection frequency greater than one per annum are programmed to provide an equal interval between each inspection throughout the year. The pattern of inspections is consistently applied to consecutive years so that the inspection intervals are maintained year on year.

5.6. Competence and Training

5.6.1. The service has evaluated the minimum standards of training and development that are required to enable officers to operate competently. This is held on a central register and reviewed annually.

5.6.2. An annual Training and Development Programme is subsequently prepared and delivered, ensuring that the minimum standards in the matrix are met.

5.6.3. All officers carrying out inspections and being designated “Inspector” will be required to complete Highway Safety Inspectors Modular Training Assessment approved by LANTRA Awards. In addition, each Local Highways Manager will be trained to the same level as Officers so that they are capable of carrying out the function of an “Inspector” to provide cover in extreme circumstances and monitor the inspection process.

5.6.4. Officers without appropriate experience or those who are newly appointed will receive inspection training/mentoring prior to their designation as "inspector" and this will be recorded.

5.6.5. Only competent officers as evidenced through training or mentoring may have the designation “Inspector”

5.7. Service Inspections - General

5.7.1. We undertake Service Inspections in conjunction with the safety inspections.

5.7.2. Service inspections are strongly focused on ensuring that the network meets the needs of users and provides future scheme identification, to ensure that they meet the levels of service defined within the Asset Management Framework. These surveys are dependent upon the Highways Infrastructure Asset Management Strategy to determine programmes of work.

5.8. Service Inspections for Carriageways, Footways and Cycleways

5.8.1. Service inspections for carriageways, footways and cycleways are carried out in conjunction with safety inspections for these assets. These surveys may be undertaken either by slow moving vehicle, on foot or by utilising data such as video depending upon the circumstances.

5.8.2. As each carriageway and footway asset is inspected in turn there are different categories of carriageway treatments that can be recommended for it, dependent on which physical features that particular section contains. The available treatment categories are Structural Treatment, Surface and Patching Treatment, Surface Treatment and Edge Treatment.

5.9. Safety and Service inspections of Public Rights of Way

5.9.1. The Public Rights of Way & Access team follows an area-based approach towards its inspection regime.

5.9.2. The regime follows Areas A, B, and C, with these areas split up into two, bar one, due to respective size. This equates to 5 area-based inspections. Inspections are undertaken across all priorities of path in set numbers of parishes annually. This equates to 20% of the County network per annum so that after a five-year period each parish and paths will have been inspected once.

5.9.3. As per Volume 1, Section 4 of this plan, where certain PROW are considered part of the footway hierarchy, safety inspections are carried out accordingly.

5.9.4. The Inspections will highlight issues, defects and obstructions on the Public Rights of Way whilst providing information on the condition of any PROW structures.

5.10. Safety and Service Inspections of Traffic Signs and Bollards

5.10.1. Traffic signs are the most visible elements of the highway network, highly valued by users, and contribute significantly to network serviceability through facilitating efficient and effective use of the network.

5.10.2. The Inspections will monitor non-illuminated signs which have fallen into the highway or are in an unsafe condition. This item includes poles which have been damaged or worked loose if they are leaning into the carriageway area. A sign shall be deemed unsafe if any of its fastening points have failed and it is visibly capable of being dislodged or moved dangerously by high winds.

5.10.3. Traffic signs shall be kept legible, visible and effective as far as possible at all times in relation to the road use and traffic speeds.

5.10.4. Signs that display a message which can be subject to enforcement identified within the inspection should be repaired or replaced in the timescales outlined in Appendix B of this Plan.

5.10.5. Any sign or bollard identified as a potential safety issue will be made safe as soon as reasonably practicable. A Large Advanced Direction Sign (ADS) identified as a safety risk will be dealt with as an emergency and made safe. Subsequently it will be put onto a programme to be replaced accordingly.

5.10.6. Vegetation potentially obscuring road signs shall be recorded during safety inspections and service inspections of carriageways, footways and cycleways and treated accordingly. The level of risk associated with such vegetation may change during periods of maximum growth.

5.10.7. Special signing schemes, for example blockwork chevron treatments at roundabouts and traffic calming schemes using special signing may deteriorate more quickly than conventional signing. They are also likely to have been installed to improve network safety, therefore liaison with LRSP must take place before considering replacement, removal or a change to the design.

5.10.8. The condition of non-illuminated road signs shall be inspected in daylight for degradation of colour, retro-reflectivity, deteriorating fittings, legibility distance, and average surface luminance, after cleaning. The frequency of cleaning required will be influenced by the risk of soiling in local areas.

5.10.9. Service inspections shall be used to identify signing that is inappropriate or no longer necessary and may be a distraction to users, or detrimental to the street scene. Such inspection is combined with the condition inspection and will be route-based, where both legality and appropriateness will be assessed, and a decision by our Signs and Lines team will be made whether to remove the sign.

5.11. Safety and Service Inspection of Road Markings and Studs

5.11.1. Inspections in respect of wear, spread, colour, skid resistance and retro-reflectivity shall be undertaken for painted and thermoplastic markings, at frequencies determined by local risk assessment. Inspections for reflective conspicuity shall be carried out during the hours of darkness and programmed to enable maintenance works to be completed before the onset of winter. This is undertaken annually and combined with the condition inspection. For more information see Section 4.10. of this Volume

5.11.2. Although the hole left by a dislodged stud is unlikely to quickly enlarge to meet the pothole criteria more than one stud missing in any particular section of road should alert

the inspector to the possibility of more failures and trigger a detailed inspection of all studs in that section.

5.12. Safety and Service Inspection of Traffic Signals and Pedestrian/Cycle Crossings

5.12.1. The priority objective is to provide and maintain all traffic signals, controlled pedestrian and cycle crossings to a high standard to ensure the safety of all road users and to ensure the efficient operation of the highway network.

5.12.2. The Traffic Signals Contractor operates a fault monitoring system which records or reports all faults such as lamp failures, detector failures etc.

5.12.3. The following standards are used in the operation of the highway network:

- urgent traffic signal faults or damage constituting a danger to the road user are attended to within two hours and repaired within 24 hours where reasonably practicable
- traffic signal controllers damaged beyond repair are replaced within 72 hours where reasonably practicable
- failed traffic signal lamps and other less urgent faults are attended to with 12 contract hours and repaired within 24 contract hours
- traffic signals installations are inspected for safety once a year
- additional cleaning is carried out when required
- warning signs are erected if traffic signals are off and temporary traffic signals will be provided where reasonably practicable

5.13. Regulatory Functions

5.13.1. A significant element of our Highway Service comprises regulation and enforcement of activities on or affecting the highway.

5.13.2. Key Regulatory duties include:

- New Roads and Street Works Act 1991
- management of Highway Register
- management of Public Rights of Way
- dealing with encroachment on the highway
- dealing with illegal and unauthorised signs
- licensing skips, hoardings, temporary closures and other authorised occupation of the highway
- construction of vehicle crossovers

5.13.3. Although each of these are separate duties, many of them have wider implications for highway maintenance, for example:

- many of these items including illegal signs or encroachment, may have the potential to contribute to accidents, and the details of how we dealt with (or did not deal with) the occurrence may be a material consideration in legal proceedings
- illegal parking on verges and footways, especially by heavy vehicles, could cause considerable damage and where this has occurred it might be relevant to increase inspection frequency and consider new materials or prevention.

5.13.4. A regime of regulatory inspection has been developed on the basis of risk assessment. Further information regarding regulatory functions can be found in our Network and Traffic Management Plan.

6. Programming and Priorities

6.1. Introduction

6.1.1. The general principles to be applied to priorities and programming are outlined in Volume 1, Section 7 of this plan, with this section relating to highways assets.

6.2. Balancing Priorities by Type

6.2.1. The broad priorities for the respective types of highway maintenance are largely determined by the outcome of safety and service inspections and condition surveys, assessed against local risks and policies. We have established priorities and programmes for each of the following:

- emergency / reactive maintenance – attending to defects and other safety matters that require urgent action arising from inspections or user information
- planned maintenance – attending to defects and other less urgent matters that may benefit from further planning leading to permanent repairs
- programmed maintenance – providing lifecycle / road condition-based work streams
- cyclic/routine maintenance – providing locally defined levels of service
- regulatory functions – regulating occupation, interference or obstruction of the network, outlined in our Network and Traffic Management Plan
- winter service – providing locally defined levels of service of salting and clearance of ice and snow, outlined in our Winter Service Plan

6.2.2. The determination of priorities and programmes for items within the categories of regulatory functions and Winter Service tend not to require any special consideration and largely arise out of the design of the services.

6.3. Priorities for Emergency/Reactive Maintenance

6.3.1. Emergency / reactive maintenance involves attending to the rectification of defects and other safety matters that require urgent action arising from inspections or user information in accordance with the locally determined levels of response. Although all such matters will by definition have a degree of urgency, some may have potentially even more serious consequences, and priorities will usually be determined exclusively on the basis of risk assessment. This risk assessment will be based upon our response time risk matrix, outlined in Appendix B of this Plan.

6.3.2. Reports from members of the public provide a source of information on the condition of all aspects of the highway network. This source is used to complement formal inspections and surveys, and this Plan is available publicly to outline the processes and systems in place. To ensure that suitable communication is provided to contributors to acknowledge receipt of information and provide feedback, fault reporting is available through the FixMyStreet website, and the Customer Service Centre provides feedback on enquiries which are all logged on the Confirm Asset Management System.

6.3.3. The option selected, together with relevant follow up, will largely be determined by operational practicalities and whether the site is already part of a programme for more comprehensive treatment, in which case a temporary repair may be an appropriate course of action.

6.3.4. Consideration will be given to one of the following:

- sign and make safe
- carry out initial temporary repair
- effect a permanent repair

6.3.5. We shall adopt permanent repairs as the first choice. Temporary repairs shall only be used where safety cannot be managed using alternative approaches and in emergency circumstances.

6.4. Priorities for Planned and Programmed Maintenance

6.4.1. There is a presumption that a programmed maintenance regime will provide lower whole life costs than one based upon a reactive approach. We therefore employ systems that enable a data-led approach to the targeting of structural maintenance.

6.4.2. The updated PMS system provides UKPMS outputs from CVI inspections. Combined with results of other surveys such as Deflectograph, SCRIM and local Safety and Service inspections enable informed decisions to be made in respect of planned maintenance programmes and treatments.

6.4.3. As mentioned in Volume 1, current and historic SCANNER and CVI condition data has been used to develop local deterioration curves for all carriageway classes, as part of our lifecycle planning development. This historic data was also used to determine the effectiveness of maintenance works carried out (for example, scheme efficiency) for

various treatment types. In combination with current treatment cost information used in DRC calculations, future carriageway surface condition by road classification was predicted for a number of treatment and budget scenarios. Strategic analysis is continuously being carried out on these scenarios to determine the most efficient maintenance strategy with current funding. These scenarios inform the targets included in our Highways Infrastructure Asset Management Strategy.

6.4.4. Programmed Maintenance within our Operational Asset Management can be divided up into the following groups developed and designed by specialist teams:

- carriageways – patching, surfacing, re-tread, surface dressing
- footways – reconstruction, patching, slurry sealing
- drainage – improvements, replacement
- minor works
- cyclic works – drainage cleansing

6.4.5. The Operational Asset Management teams that deliver these programmes of work are:

- patching and resurfacing
- surface treatments
- minor works and traffic
- Drainage and cyclic

6.4.6. For scheme identification and prioritisation on the MRN, Hierarchy 1, 2, 3 and 4 network a Lincolnshire Condition Indicator (LCI) has been developed. This combines data from CVI and SCANNER surveys to give an overview of the condition of the network. Potential schemes are identified based on a visual assessment of the condition information. All available condition data including SCANNER, CVI, residual life from Deflectograph surveys and SCRIM held in Confirm is used to prioritise schemes and identify suitable treatments.

6.4.7. The maintenance schemes for carriageways are identified using the following stages:

- the information obtained from condition surveys is assessed to establish an indicative programme with process outlined in Section 6.4.6.
- as part of the calculations for prioritisation, reactive jobs, defect reports from the public and insurance claims are taken into consideration. More reactive jobs, unique defects reported and claims increase the weighting added to the final scoring assigned to the site. This integration of condition data and customer information allows us to further target our resource to meet the need of the network and the user.
- the indicative three-year programme for individual hierarchies should then be developed into individual schemes that meet the levels of service in the Highways Infrastructure Asset Management Strategy. The schemes may then be prioritised using a process of Value Management. Schemes are not necessarily prioritised on the basis

of ‘worst first’ as this is unlikely to provide the best value for money in terms of whole life cost.

6.4.8. The list of schemes developed is provided to our asset management engineers who undertake further investigation and assessment to refine the details of the scheme and develop the detailed treatment schedules for the works, taking into account the following Value Management:

- whole life costs
- network management considerations
- buildability
- the budget available
- risk

6.4.9. The data alongside engineering expertise generates a five-year programme of major structural maintenance schemes for the strategic road network (MRN, H1 and H2), which is updated annually on the basis of latest survey data.

6.4.10. The LCI is used to generate a three-year indicative programme for maintenance schemes on the H3 and H4 carriageway network, with an annual works programme for the schemes of work outlined, approved and published on our website.

6.4.11. For the Unclassified Network (H5, H6, H7 and H8), schemes are determined using a combination of CVI data and the priorities of Local Highway Managers. CVI combined with annual local Safety and Service inspections undertaken by the Local Highways teams enable effective planning of maintenance programmes.

6.4.12. Further elements included in determining the prioritised list shall be clusters of enquiries highlighted by members of the public regarding surface defects, location to generate linked work schemes to improve efficiency.

6.4.13. Surface Dressing will be linked with this approach, as well as aligning itself with patching works around the county and any local safety issues regarding skidding resistance. All surface dressing schemes will take into account lifecycle planning, with SCRIM surveys and PRN data guiding prioritisation. Routine Surface Dressing programmes of work are further based upon the results of local inspections and reports from CVI surveys and facilitated by Local Highway Managers.

6.4.14. Footways and cycleways undergo a similar scheme prioritisation process, with the data from the FNS (Footway Network Survey) collated and processed. This data is used in a calculation for footway scoring, this score then has weighting applied to it based on, customer fault reporting, location and usage of a footway.

6.4.15. Similarly to LCI for carriageways, this allows a union of condition data and customer enquiries to use all available information to fully prioritise our repairs on the network.

6.4.16. A three yearly indicative programme of schemes will be generated highlighting priorities, with an annual fixed programme outlined, approved and made publicly available.

6.4.17. Budget disaggregation to Asset Managers is also based upon the visual survey data output to ensure that available funding is correctly apportioned. Maintenance funding for other nonroutine elements of the network such as signs, lighting columns are based upon inventory counts.

6.4.18. Programmed maintenance seeks to minimise cost over time and to add community value to the network or to the environment. It can also be for safety purposes by, for example, improving skidding resistance or contributing to serviceability by, for example, improving ride quality.

6.4.19. As demonstrated in this section, we have developed priorities and programmes for the structure, surface and edge of carriageways, footways and cycleways, using data such as age, condition, hierarchy, location and lifecycle planning.

6.4.20. Programmed maintenance schemes may be more expensive than routine or reactive treatments in initial cost but should be designed to have a lower whole life cost, therefore providing value for money. The determination of priorities between competing schemes is based more objectively utilising robust Value management. Quarterly Value Management sessions are formalised to ensure this approach towards Programmed maintenance.

6.5. Priorities for Routine Maintenance

6.5.1. Routine maintenance is primarily for the purpose of providing defined levels of network serviceability, maximising availability, reliability, integrity and quality. The priorities and programmes are determined largely, but not exclusively, from non-urgent defects identified during service inspections together with items from safety inspections not requiring urgent attention and user requests.

6.5.2. Priorities and programmes have been defined for all routine maintenance categories based on the Highways Infrastructure Asset Management Strategy. Routine maintenance for each category may be undertaken separately, according to the frequency defined in each case, but it will usually be more efficient to combine a number of operations into a co-ordinated programme. Consideration shall be given to co-ordination with other related street activities.

6.5.3. The results of safety inspections identifying non-urgent works, condition surveys and customer requests may also generate routine works programmes.

6.5.4. We undertake numerous forms of cyclic and/or routine maintenance:

- drainage systems – cleansing and repair
- embankments and cuttings – drainage and stability
- landscaped areas and trees – management

- verges – grass cutting
- fences and barriers – tensioning and repair
- traffic signs and bollards – cleansing and repair
- road markings and studs – replacement
- weed spraying

6.5.5. Routine maintenance standards for cyclic works such as drainage cleansing, grass cutting, tree management and sign cleaning are defined in Section 4 of this Volume. For fences and barriers, please refer to Volume 4 Structures.

6.5.6. Timing of such cyclic works can be dependent upon various factors such as time of year or weather conditions. Asset management ensures that all cyclic work is structured so that a consistent approach to this type of work and effective service delivery is maintained.

6.6. Value Engineering and Treatment Best-Practice

6.6.1. We adhere to the second stage of the Value Management process that is conducted on an individual scheme, to optimise both the design and construction phases. In principle, it reduces the risk associated with unforeseen issues at the time of scheme development.

6.6.2. We utilise our Maintenance Design Manual, outlined by expert Lincolnshire designers based on recognised best practice, as our starting point for design. The Maintenance Design Manual deals with the design element of non-cyclic works. The manual has been prepared to ensure uniform, economic designs are produced throughout the county and utilises the results of research carried out both nationally and locally.

6.6.3. It further follows the guidance documents set by the Road Surface Treatments Association (RSTA) that aim to raise awareness of the range and benefits of road surface treatments, and to encourage product and process innovation. Many of these have been produced in conjunction with the ADEPT Soils and Materials Design Group, and cover topics including service lives, surface dressing, innovative patching products and systems, high friction surfacing, structural road recycling, crack sealing and slurry surfacing, geosynthetics and steel meshes, asphalt preservation systems, grouted macadam, retexturing and ironwork installation.

6.6.4. In terms of Surface Dressing, we adhere to Transport Research Laboratory's Road Note 39 which sets out Best-Practice when considering surface dressing programmes.

Volume 3 - Drainage

1. Introduction

1.1. Overview

1.1.1. The purpose of this volume is to define the responsibilities of the Highway Authority in terms of highway drainage and how we manage our assets. As we develop our highway drainage asset management function this volume will be updated accordingly.

1.1.2. Highway drainage is provided to ensure safe passage along our highways by all road users during inclement weather and to reduce the risk of flooding from our assets. It does so by capturing surface water runoff from the carriageway, footways, access crossing and highway verges and conveying it to a suitable point of disposal, efficiently as possible. Highway drainage also supports the structural integrity of the carriageway structure by preventing the ponding of water on the carriageway which would otherwise allow it to penetrate the road surface and cause damage through the softening of the carriageway foundation or through freeze/thaw action.

1.1.3. There will be other drainage assets under or adjacent to our highway that will be owned or managed by others. This will include water companies, IDB's, management companies, private riparian owners, other local authorities, private enterprises, and riparian owners.

1.1.4. The role of Lead Local Flood Authority and the duties that beholds reside with the Flood Risk team, and whilst they are outside of the Highways Services, we are an active partner in Flood Risk framework within Lincolnshire.

1.2. Highway Drainage Systems

1.2.1. Traditionally, highway drainage systems have comprised networks of pipes and gullies discharging into sewers and watercourses but over the last decade or so they have become more complex, to comply with changes in legislation and accommodate the predicted changes in future weather patterns. Highway drainage systems now routinely store surface water runoff and release it at a controlled rate that reflects the natural environmental conditions.

1.2.2. Sustainable drainage systems (SuDS), comprising 'on the surface drainage' or visible features are now commonplace on new developments and major highway projects and can include features such as swales, attenuation lagoons and filter verges. Disposal of surface water by infiltration is now more common place.

1.3. Highway Drainage Definition and Components

1.3.1. We define our highway drainage systems as conduits, 600mm or less in diameter, and channels, together with their ancillary components that lay beneath, or alongside publicly maintainable highway built for the purposes of solely carrying/temporarily storing surface water runoff from publicly maintainable highway, prior to disposal.

1.3.2. Components of a drainage system can include but are not limited to:

- pipes and culverts
- gullies and offlets
- grips
- sustainable drainage systems
- combined kerb drainage
- below ground and at surface water retaining structures
- open channels
- chambers and soakaways
- pollution control devices
- ancillary devices – penstocks, flap valves, flow controls

1.3.3. Information on culverts greater than 600mm diameter can be found in Volume 4 of this plan.

1.4. Highway Flooding

1.4.1. The highway may flood if the surrounding land is in flood and there are limitations to the action that can be reasonably taken. If it is subsequently determined that the flooding is attributable to deficiencies in infrastructure or the maintenance regime, given the nature of the weather conditions under which it occurred, then action to permanently relieve the problem shall be considered which may involve consultation with other public bodies and third parties. If the event is attributable to the actions of a third party, the matter shall be taken up with them at the earliest opportunity.

1.5. Ground Water

1.5.1. Groundwater emergence can happen when the level of water within the rock or soil that makes up the land surface (known as the water table) rises. The level of the water table changes with the seasons due to variations in long term rainfall and water abstraction. When the water table rises and reaches ground level, water starts to emerge on the surface and flooding can happen. Once raised, levels can remain high for weeks or months and their location can be transient and not always where you would expect. Intercedence into occurrences of groundwater can include the placement of flood boards to highlight the issue or the placement of temporary traffic signals to allow safe passage. The priorities of such actions will usually be determined exclusively on the basis of risk assessment. This

risk assessment will be based upon our response time risk matrix, outlined in Appendix B of this Plan.

1.6. Partnership Working

1.6.1. Flooding and drainage issues on the highway can be the result of surface water issues/runoff from several sources. Where this is recognised, joint or partnership schemes may be developed with the appropriate Risk Management Authorities to develop a comprehensive solution.

1.6.2. We actively participate in the Joint Lincolnshire Flood Risk and Water Management Partnership Management and Strategy Groups and the Local Flood Risk & Drainage Management Groups.

1.7. Lead Local Flood Authority Flood Investigation Reports (Section 19 Reports)

1.7.1. Reports from the Lead Local Flood Authority (Floods & Water Management Act S19), issued following internal flood events, will be reviewed and where it is considered the Highway Authority may need to take action, further detailed investigations will be undertaken. Any short comings identified in our assets will be future mitigated by undertaking a change in maintenance intervention periods (for example, increased gully cleansing frequency) through to the upgrading or provision of measures that manage surface water on the highway more effectively (for example, upgraded highway drainage systems).

1.8. Chamber and Gully Covers & Frames (Ironwork)

1.8.1. Ironwork comprising covers, gratings, frames and boxes set in carriageways, footways and cycleways has the potential to compromise safety and serviceability, and in certain cases cause noise and disturbance to local residents. Responsibility for defective ironwork may lie with utility providers.

1.8.2. Defects identified during routine inspections or from enquiries will be inspected and either made safe by the Highway Authority or the relevant utility provider will be formally notified, and if required followed up, to ensure that dangerous defects are remedied within the prescribed timescale.

2. Legal Framework

2.1. Statutory Obligations

2.1.1. General duties and powers are dealt with in Volume 1 of the plan. This section contains information on duties and powers specifically related to highways.

2.2. Highway Specific Legal Considerations

2.2.1. The Highways Act 1980 sets out the main duties of Highway Authorities in England and Wales. Section 41 imposes a duty to maintain highways maintainable at public expense.

2.2.2. Section 58 provides for a defence against action relating to alleged failure to maintain on grounds that we have taken such care as in all the circumstances was reasonably required to secure that the part of the highway in question was not dangerous for traffic.

2.2.3. Additional Acts relevant to the HIAMP are outlined in Appendix E of this Plan.

3. Asset Management Information

3.1. Introduction

3.1.1. Asset data management and its systems are prescribed within the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B and Part C.

3.1.2. We operate with the Asset Management System Confirm, which among other assets, stores drainage assets.

3.2. Principles and Considerations

3.2.1. The Confirm asset management system supports the following list of functions with regards to drainage assets:

- collection, storage and retrieval of inventory data and condition data
- works management and prioritisation
- asset valuation – both gross replacement and depreciated replacement cost to support whole of government accounting requirements
- deterioration modelling and life cycle planning
- aid in management and storage, in electronic format, of drawings, photographs and reports

3.3. Management of Asset Information

3.3.1. Like many highway authorities, the completeness of information of our drainage asset records is variable. We have embarked on a long-term project to enhance and expand the dataset through:

- review of digital data
- review of archived documents and drawings
- on site inspection

- review of third-party asset records

3.3.2. Our data sources will comprise, but are not limited to:

- silt level data collected from gullies by cleansing operatives,
- drainage investigations
- as built/adopted development drawings and documents
- as built drawings and documents for improvement, renewal and new highway/highway drainage schemes
- customer Enquiries
- s19 flood investigation reports
- third party data for example, sewer records

3.3.3. To encompass the additional data we harvest, we have set up a new suite of drainage asset classes to ensure efficient and accurate data entry and retrieval. The asset classes are as follows:

- Class 0 – Drainage Other (Rainwater harvesting for example)
- Class 1 – Collection Points (Gullies for example)
- Class 2 – Collection linear
- Class 3 – Drainage Nodes (Manholes for example)
- Class 4 – Drainage Linear
- Class 5 – Flow Controls
- Class 6 – SuDs Open storage
- Class 7 – SuDs Linear
- Class 8 – SuDs Infiltration
- Class 9 – SuDs Surface
- Class 10 – Pumping Stations
- Class 11 – Pollution Control Devices
- Class 12 – Screens
- Class 13 – Storage Tanks
- Class 14 – Pumps
- Class 15 – Drainage Structures
- Class 16 – Easements

4. Asset Condition

4.1. Condition of the Highway Drainage System

4.1.1. We are continually looking to improve our processes and systems to determine, understand and manage the condition of our assets. Overtime this will allow us to develop a full understanding of the condition of our drainage assets and facilitate timely maintenance interventions.

4.1.2. We currently obtain information on the condition of our gullies, offlets, chambers and laterals during routine cyclic cleansing activities which includes surface visible defects.

4.1.3. We also record the depth of silt condition of our gullies, chambers, offlets and laterals by recording the depth of silt each contains. This information is used to review the adequacy of the cleansing interval as detailed in Section 6.

5. Inspections

5.1. Overview

5.1.1. Surface visible drainage defects will be identified through our Highway Safety Inspection regime as defined in Volume 2.

5.1.2. As part of our drainage cyclic cleansing regime, surface visible defects are noted by the cleansing operatives and recorded in Confirm for assessment and action as required.

6. Programming

6.1. Classification of Drainage Activities

6.1.1. Five classifications have been made for drainage activities, which are as follows:

- emergency/reactive works
- routine maintenance works
- planned maintenance works
- programmed minor works
- major drainage works

6.2. Emergency/Reactive Works

6.2.1. Emergency/reactive maintenance involves attending to the rectification of defects and other safety matters that require urgent action arising from inspections or user information in accordance with the locally determined levels of response. Although all

such matters will by definition have a degree of urgency, some may have potentially even more serious consequences, and priorities will usually be determined exclusively on the basis of risk assessment. This risk assessment will be based upon our response time risk matrix, outlined in Appendix B – Response Times of this Plan.

6.2.2. Emergency/reactive works are assessed and prioritised on the basis of a risk assessment and those that require more urgent intervention can include but are not limited to the following situations:

- major rainfall/flood event(s)
- catastrophic failure of an asset
- internal property flooding
- groundwater causing standing water spanning the whole width of the carriageway and preventing safe passage.

6.2.3. Where despite effective maintenance operations, flooding of the highway occurs, with implications for safety or serviceability, relevant warning signs will be placed in position as quickly as possible, and users advised through local media. The cause of the flooding shall be determined and addressed as appropriate.

6.3. Routine Maintenance Works

6.3.1. We undertake gully and chamber cleansing on a targeted risk-based approach with cleansing frequencies of 6 months, 1 year and 2 years allocated. The frequency is applied to the street rather than individual asset to maximise productivity.

6.3.2. The frequency for intervention is decided upon using the following factors:

- road hierarchy
- silt level in pot
- s19 reports
- flooding reports
- asset location (tree lined street, bottom of a hill)
- highway officer local knowledge

6.3.3. Material arising from the cleansing of highway drainage assets has the potential to cause pollution. Therefore, all arisings will be disposed of correctly, in accordance with local and national requirements. We currently have our own facility in Sleaford, which manages cleansing arisings in a sustainable way and any arisings that are identified as unsuitable for inhouse disposal will be taken to an appropriate facility for treatment and/or processing.

6.3.4. Other drainage assets are maintained/cleansed on a reactive basis but a transition to planned maintenance for all drainage assets is underway.

6.4. Planned Maintenance Works

6.4.1. Planned maintenance is rectification of defects discovered through routine maintenance activities or defects reported as enquiries from Fix my Street for example, that do not warrant emergency or reactive actions.

6.4.2. Examples of planned maintenance are blocked gully laterals, seized flap valve, stuck/seized chamber covers or gully grates.

6.5. Programmed Minor Works

6.5.1. Programmed minor drainage schemes are smaller schemes with a typical value of less than £75,000. Examples of the type of scheme undertaken are existing pipe repairs, additional gullies and pipework and small scale end of service life replacement/renewal.

6.5.2. Programmed minor drainage schemes are undertaken over a two-year period year. The first year is to allow for the investigation of the problem and to design a solution, the second year allocated to construction. There will be instances where more urgent work is needed, beyond the scope of emergency/reactive works, and allowance is made in our programmes for such events.

6.6. Major Drainage Works

6.6.1. Major drainage works can be defined as schemes that entail the renewal of complete or significant parts of existing drainage systems or significant new installations. These can be standalone schemes or linked with other highway improvement works. In some circumstances a highway drainage scheme may form part of a partnership scheme with other Risk Management Authorities.

6.6.2. These schemes will usually involve installing or upgrading drainage systems to comply with current nationally recognised design guidance including allowances for future climate change and the control of discharges to help manage/reduce the risk of flooding.

- emergency/reactive works
- routine maintenance works
- planned maintenance works
- programmed minor works
- major drainage work

Volume 4 – Structures

1. Introduction

1.1. Context of Volume 4

1.1.1. Volume 4 of the HIAMP deals with the highway structures associated with the adopted road network which meets the following definitions and dimensional criteria of our Structures Assets

- a highway bridge - greater than 1.5m span/diameter supporting the highway spanning a maintainable watercourse (either EA/ IDB/ Riparian), Railway, road or cut in the topography. Both inlet and outlet of the bridge shall be on the route of the maintainable watercourse. There are instances where some bridges are owned and maintained by third parties (EA/ IDB/ Network Rail/ Private)
- a Highway Culvert - greater than 600mm span/ diameter supporting the highway spanning a maintainable watercourse (either EA/ IDB/ Riparian). Both inlet and outlet of the culvert shall be on the route of the maintainable watercourse. There are instances where some assets are owned and maintained by third parties (EA/ IDB/ Network Rail/ Private)
- a Highway subway is a structure for the purpose of pedestrian passage under the maintainable highway
- a highway Retaining wall, retaining height greater than 600m in height, upholding the highway. There are times where this can be relating to upholding earthworks for the purpose of building the highway.
- Sign/Signal gantries
- footbridges (some are owned by our Public Rights of Way team)
- tunnels (a road tunnel with an enclosed length of 150m or more through which a road passes) Barnack Road rail tunnel is a rail tunnel owned by Network Rail, but we carry out joint inspections for the section under Barnack Road

1.1.2. Part C of the Well-Managed Highways Infrastructure Code of Practice has slightly different dimensional boundaries (1.5 span for bridges and culverts – although DMRB is 0.9m, also retained height is 1.35m for retaining walls). In addition, the general principles apply to structures associated with all other highways that are used by the public. For example, segregated footpaths and cycleways, and the Public Right of Way network.

1.1.3. Highway Structures include Culverts, Bridges, Footbridges, Retaining Walls, Subways and Overhead Gantries. There are 4035 structures in Lincolnshire that are our responsibility including 1516 bridges (over 1.5m span), 2206 culverts, 14 Subways, 141 Highway footbridges and 148 recorded retaining walls. In addition, there are a further 1789 privately owned structures, carrying County roads. The main owners of these are Network

Rail, National Highways (Historic Railways Estate), the Environment Agency and various Internal Drainage Boards.

1.1.4. Some two thirds (66%) of the County's bridges are situated on minor (C class or unclassified) roads, with 22% on Principal Roads (A class) and the remaining 12% on B roads. Approximately 60% of the bridge stock was built prior to 1922. A high proportion of the bridges and culverts in Lincolnshire consist of brick arches, many in excess of 100 years old.

1.1.5. The overarching principles and common themes of maintaining highway infrastructure are covered within Volume 1. Asset specific guidance for highways, drainage, street lighting and trees are covered in Volume 2, Volume 3, Volume 5 and Volume 6 respectively.

1.1.6. Highway structures represent a significant investment, with most being publicly owned and many being prominent features in the local environment. In Lincolnshire, as in the entirety of the UK, the management of highway structures is undertaken by a variety of owners or agencies.

2. Legal Framework

2.1. Statutory Obligations

2.1.1. General duties and powers are dealt with in Volume 1 of this HIAMP. All relevant legislation on Highways Structures is mentioned in Appendix E of the Plan.

3. Asset Management Information

3.1. Introduction

3.1.1. Asset data management and its systems are prescribed within the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B and Part C.

3.1.2. We operate with the asset management system Confirm, which among other assets, stores all Structures.

3.2. Principles and Considerations

3.2.1. The Confirm asset management system supports the following list of functions with regards to Structures assets:

- collection, storage and retrieval of inventory data and condition data
- works management and prioritisation
- asset valuation – both gross replacement and depreciated replacement cost to support whole of government accounting requirements

- deterioration modelling and life cycle planning
- aid in management and storage, in electronic format, of drawings, photographs and reports

3.3. Management of Asset Information

3.3.1. Data entry for Inspections, mostly for General Inspections is combined with the identification of needs in order to produce a more time and cost-efficient approach. The highway structures stock is divided into groups and sub-groups: Bridges, Culverts, Retaining Walls, Safety Barriers and Fences, Signal Gantries, Structures, PROW and a drainage group. These groups have similar deterioration characteristics and maintenance.

3.3.2. The extent of the data we hold can be summarised by the following, by no means exhaustive list: Basic inventory data (the basic data and information on the stock of highway structures in terms of descriptive parameters), Condition data, Structural Assessment and Review data and a Health and Safety File.

3.3.3. General and Principal Inspections provide the majority of condition data. These are supplemented by Special Inspections, testing and monitoring, as appropriate, where the data sought is often focused on a particular part of the structure or aspect of performance. More information on the various types of inspections can be found in Section 5 of this Volume..

3.3.4. Condition data from previous inspections is retained as the evolution of this data over time, which gives a clear indication of the rate of deterioration and residual service life. This data is used to estimate deterioration rates for different element and structure types which may be utilised to develop lifecycle plans.

4. Asset Condition and Investigatory Levels

4.1. Introduction

4.1.1. We are responsible for the construction, maintenance and repair of highway structures that we own. This section will focus on the design and construction element of our responsibilities.

4.1.2. All design specifics for small-scale structures have been defined in Section 12 of our Maintenance Design Manual (MDM).

4.1.3. All maintenance work should preferably be designed to current standards, although there may be situations where lesser standards are acceptable. For example, repair of part of an element, repair of accident damage. Each case should be considered on its merits.

4.1.4. The design life for adoptable highway structures is 120 years and technical design standards produced by the Department of Environment and Economy are intended to achieve this.

4.1.5. The Design Manual for Roads and Bridges (DMRB) and the Manual of Contract Documents for Highway Works (MCHW) are maintained by National Highways on behalf of all Overseeing Organisations (the national highway/roads authorities in England, Scotland, Wales and Northern Ireland).

4.1.6. The DMRB provides detailed guidance in the form of standards (BDs) and advice notes (BAs) for most aspects of highway structure design and assessment. The guidance includes criteria for structural loading, analysis, material properties, element design or assessment, in addition to geometrical requirements and best practice for design for durability. Our own MDM takes note of these standards and integrates them into our service standards.

4.1.7. All structural design and assessment are subject to a formal Technical Approval procedure.

4.1.8. Departures from DMRB standards are carefully recorded to enable an audit trail for certification by us through a standard departure form.

4.1.9. The Eurocodes are a series of European Standards developed by the European Committee for Standardisation, to provide a common approach for the design of buildings and other civil engineering works and construction products. The Eurocodes have replaced national codes that were previously published by national standard bodies and have become mandatory for European publicly funded works. As with other European standards, the Eurocodes will be used in public procurement.

4.1.10. Changes in demand in the future may alter how a structure should be managed. The prediction of future demand on highway structures should align with the network demands and are likely to include changes in vehicle weight, height and width, and traffic volume. Future demands can be predicted using available data, historical trends, and local factors.

4.2. Resilience Requirements

4.2.1. The principles of resilience for highway infrastructure shall be dealt with in the Resilient Network Plan, which outlines how we maintain a resilient network during adverse weather events and other emergency situations. This document, among other things, will outline contingency plans generated for structural failure caused by extreme weather events.

4.2.2. For the purposes of this plan, it is important to highlight that inspections, overall maintenance of structures and fixed design standards ensure a robust approach which minimises risk of structural failure. Failure is defined as the inability of a structure, or one of its primary load-carrying components, to perform its intended function of being safe for use and fit for purpose.

4.2.3. For more information on Inspections and maintenance, please go to Section 5 of this volume.

4.3. Interaction with Other Owners and Third Parties

4.3.1. The Structures Manager shall work with other owners and third parties in order to maintain the safe operation of the public highway and to carry out maintenance work.

4.3.2. We may carry out the following activities on Third Party Structures:

- clearing vegetation for General Inspections
- clearing obstructions to prevent immediate flooding
- carrying out general inspections and reporting safety issues to owner
- carrying out accident damage procedures that includes:
  - operating a recoverable works system
  - signing and guarding
  - special inspections, excluding preparing cost estimates
  - reporting the inspection results and recommendations to the owner
  - invoicing the owner for costs that we incur

4.3.3. We are not responsible for any Trunk Road structure. Trunk Road structures are managed by National Highways or their agents. In the case of Network Rail structures, the General Inspection will specifically exclude inspection from land owned by Network Rail.

5. Inspection, Assessment and Recording

5.1. Introduction

5.1.1. The general principles to be applied to inspections, assessment and recording are outlined in Volume 1 of this HIAMP. This section covers guidance for each category of inspection relating to structures.

5.1.2. Inspection, testing and monitoring shall be used to:

1. provide data on the current condition, performance and environment of a structure. The data enables the Structures Manager to assess if a highway structure is currently safe for use and fit for purpose, and provides sufficient data for actions to be planned where structures do not meet these requirements
2. inform analyses, assessments and processes. The outputs inform asset management planning and enable cost effective plans, which deliver the agreed levels of service
3. compile, verify and maintain inventory data

5.1.3. The Inspection Manual for Highway Structures (Volumes 1 and 2) was commissioned by National Highways and published in May 2007 and is utilised for our inspection regimes.

5.1.4. Structures Inspections can be divided up into three different inspection types: General Inspections, Principal Inspections and Special Inspections.

General Inspection

5.1.5. General Inspections comprise a visual inspection of all parts of the structure (that can be inspected without the need for special access or traffic management arrangements) and, where relevant to the behaviour or stability of the structure will include an inspection of the adjacent earthworks or waterways.

Principal Inspection

5.1.6. Principal Inspections comprise a close examination, within touching distance, of all accessible parts of a structure, including, where relevant, underwater parts and adjacent earthworks and waterways, utilising suitable access and/or traffic management works as necessary. Closed circuit television and high-resolution digital photography/video may be used for areas of difficult or dangerous access. For example, obscured parts of a structure, confined spaces and underwater inspections.

5.1.7. A Principal Inspection will establish:

- the scope and urgency of any remedial or other actions required before the next inspection
- the need for a special inspection and/or additional investigations
- the accuracy of the main information on the structure held in the inventory

5.1.8. Both Principal and General Inspections will be of sufficient scope and quality to determine:

- the condition of all parts of the structure
- the extent of any significant change or deterioration since the last inspection
- any information relevant to the stability of the structure and/or continued use in service and safety

Special Inspection

5.1.9. There are occasions when a more specific inspection, concentrating on the condition of particular parts of the structure, is required. This is known as a Special Inspection. The need for a Special Inspection normally arises due to specific circumstances or following certain events.

Acceptance Inspection

5.1.10. The need for an Acceptance Inspection should be considered when there is a changeover of responsibility for the operation, maintenance and safety of a structure from one party

to another. The Acceptance Inspection is normally carried out by the party taking over responsibility but who may be accompanied by the other party to facilitate agreement.

5.2. Inspection Regime

5.2.1. Summary of Inspection Cycles

Structure Type	Inspection Type	Classification	Cycle
Culverts	General	Brick or Reinforced Concrete	Two years
Culverts	General	Corrugated Steel or Concrete Pipes	Six years
Bridges and Miscellaneous	General	All	Two years
Bridges and Miscellaneous	Principal	Span greater than five metres	Six years
Bridges and Miscellaneous	Principal	Span less than five metres	Subject to risk assessment
Retaining Wall	General	Retained Height greater than three metres	Two years
Retaining Wall	General	Retained Height greater than 1.37m	Six years

Notes: -

1) Refer to Appendix D for Type of Structure definitions
2) Structures on the PROW network will be subject to an independent inspection and recording regime.

5.2.2. We carry out routine surveillance as part of our regular Highway Safety Inspections. We will inspect the surface over highway bridges, footbridges and through subways at regular intervals to identify any potential trips.

5.2.3. Structures inspections exclude all drainage that is defined as a pipe with a diameter or span less than 600mm.

5.2.4. We carry out General Inspections on Third Party structures as a duty of care to protect the safety of the general public and road users.

5.2.5. We carry out General Inspections of all structures that carry or support County Maintained Highway or Highway footpaths. General Inspections are also carried out on structures with spans five metres or greater carrying Public Right of Ways. Our Structures Team shall also

note significant potential trips on the walking surface of bridges, footbridges and subways. The steps and ramps leading to subways are an extension of the walking surface.

5.2.6. Retaining walls will receive General Inspections every six years, unless greater in height than three metres, in which case they will be inspected every two years. No Principal Inspections are carried out on retaining walls.

5.2.7. The frequency of General Inspections will be every two years. For Public Rights of Way footbridges over five metres span General Inspection interval is six years, and Public Rights of Way bridges between 5 and 10m span receive a Principal Inspection at six yearly intervals (instead of General Inspection).

5.2.8. Public Rights of Way staff will have sole responsibility for carrying out inspections to structures with spans less than five metres carrying Public Rights of Way. The frequency of inspection of structures on Public Rights of Ways is every two years on sign posted paths and three years on every other path.

5.2.9. The Structures Team carry out all General Inspections and Principal Inspections of all County owned structures (that are eligible*) that carry or support County Maintained Highway and Highway footpaths.

*Structures with spans less than five metres will receive a risk assessment to determine the requirement for a Principal Inspection. In many cases a General Inspection every two years will be more than adequate.

5.2.10. The approach to risk-based inspection intervals taken within Lincolnshire is that, in most cases, General Inspections will occur every two years, and where the structure qualifies for a Principal Inspection, it will take place every six years. This approach presents a regularity of inspection interval and record keeping which reduces our risk.

5.2.11. There may be circumstances in which a Principal Inspection interval is reassessed depending on other information available to the Structures Team at the time (for example, available records from third parties such as NR or CRT).

5.2.12. According to Well Managed Highway Infrastructure: A Code of Practice (Oct 2016) culverts less than 1.5m span are no longer defined as structures. However, within Lincolnshire, the view is that this asset will continue to need to be managed. A risk-based decision has been taken to reduce the General Inspection interval for concrete pipes and corrugated steel pipes between 0.6m and 1.5m diameter to six yearly.

5.2.13. The Structures Team will carry out or organise **Special Inspections** that fall into three distinct categories:

Routine Diving Inspections

5.2.14. The Structures Team carry out risk assessments of structures susceptible to the effects of scour based on local knowledge of the form of bridge construction, soils, foundation type,

risk of flash flooding, tidal waters, etc. Diving inspections are categorised into two groups according to the risk and different frequency of inspections allocated. Only a limited number of structures known to be at risk or likely to be at risk are targeted. Diving inspections are carried out by commercial divers under contracts awarded by competitive tender.

5.2.15. The current policy is to carry out a small number of diving inspections every year, with structures inspected at intervals determined by perceived risk of scour. A small number of bridges are inspected annually, generating two-to-four-year cycles for inspection.

5.2.16. Our Structures Team utilises Sonar technology to inspect the Trent Bridge in Gainsborough annually, instead of Diving inspections, which reduces the risk taken by inspectors and increases the amount of data that can be picked up during an inspection. We continue to explore options to increase the utility of sonar technology within its inspection regime, keeping into account risk, suitability, safety, and the cost of such an enterprise.

Routine Monitoring

5.2.17. The Structures Team will carry out monitoring of structures where movement or scour may lead to failure of a structural element. In addition, those bridges which have failed a bridge assessment but have not been weight restricted are assigned a monitoring frequency of 3, 6 or 12 months, depending upon the degree of concern or risk.

Special Inspections not part of the routine inspection programme

5.2.18. The Structures team shall carry out special inspections:

- to investigate a specific problem as a follow up to a previous inspection
- if settlement or rotation is reported
- after flooding of abnormally high-water flows where a problem is anticipated
- after a major accident or incident
- in response to safety concerns by individuals or representative bodies

Acceptance Inspections

5.2.19. Acceptance Inspections on new, existing and concession structures include the following, as appropriate:

1. Handover of a new structure:
    - an Acceptance Inspection should be undertaken for new structures about one month before the issue of the completion documentation or opening to traffic. A Principal Inspection is used for this purpose.
2. Transfer of an existing structure:
    - an Acceptance Inspection should be undertaken prior to an authority taking over responsibility of an existing structure. A Principal Inspection should be carried out as

part of the Acceptance Inspection unless the results of a recent Principal Inspection are deemed to be relevant and sufficient.

5.2.20. The arrangements of an Acceptance inspection shall be integrated within the section 38 and 278 processes regarding adoption of roads and any potential improvement works to be undertaken on developments.

5.3. Safety and Service Inspection of Fences and Barriers

5.3.1. Steel and wire road restraint systems shall be inspected at intervals determined through risk assessment in respect of mounting height, surface protective treatment and structural condition, to ensure that they remain fit for purpose. Tensioning bolts of tensioned safety fences should be checked and reset to correct torque at intervals determined by risk assessment. Safety barriers adjacent to bridges shall be inspected as part of the highway asset, as well as part of General and Principal Inspections for structures.

5.3.2. Pedestrian safety fences, boundary fences and environmental barriers for which we are responsible, shall also be inspected in respect of integrity, and where appropriate stock proof qualities, during the course of service inspections of carriageways, footways and cycleways. These inspections are undertaken as part of our Local Highways Teams duties and more information on their inspection frequencies can be found in Volume 2, Section 4 and 5 of this Plan.

5.3.3. Vehicle restraint systems are inspected in accordance with our strategy based upon the UKRLG/DfT October 2011 document – Provision of Road Restraint Systems for Local Authorities.

5.3.4. Safety barriers and fences adjacent to railway lines shall be inspected irrespective of liability.

5.4. Condition of Fences and Barriers

5.4.1. It is required that all safety fences be maintained to a sufficient sound structural condition to serve their purpose and not to be a danger to road users or pedestrians. All damaged sections of safety fence will be made safe (signing and guarding) within 24 hours unless the damage is superficial and there is no loss of integrity.

5.4.2. All high-risk situations are subject to a robust inspection regime with a commensurate high level of condition. Road restraint systems are maintained in a sufficiently sound structural condition to serve their function and not be dangerous to road users or pedestrians.

5.4.3. Pedestrian guard rails, boundary fences and environmental barriers will be inspected in respect of integrity during the course of a condition inspection. (The general condition of timber guard rails, not associated with a structure, will be checked each year in conjunction with condition inspections.)

5.4.4. All steel beam safety fences will be inspected at the intervals in the table below:

Type of safety fence	Inspection
Steel Beam Safety Fence	Inspection every five years for mounting height, surface protective treatment and structural condition.
Tensioned Safety Fence	Tensioning bolts should be checked and reset to correct torque every two years.

5.5. Competence and Training

5.5.1. A programme of Continuing Professional Development (CPD) and training for Structures Managers, Engineers, Inspectors and other staff shall be provided to enable them to understand and implement the processes described within the HIAMP.

5.5.2. New members of staff are encouraged to participate in the Bridge Inspector Certification Scheme, where they will be provided with specific training on all elements of structure inspections, including sampling and testing.

5.5.3. The Structures team further enables members of staff to complete further education up to degree level and participate in the company approved training scheme (approved by the Institution of Civil Engineers) up to Incorporated Engineer and where possible Charted Engineer status.

5.6. Structural Reviews

5.6.1. The future management of highway structures should include a regime of ongoing structural reviews to ascertain their adequacy to support imposed loads. Such reviews should be undertaken when significant events occur that could increase the imposed loads above those previously assessed for and/or reduce the load bearing capacity of structures. A structural review should be undertaken, for example, when one or more of the following conditions or events occur:

- the structures are known or suspected to have load bearing capacities below those deemed to be appropriate for the class of highway supported
- there is a significant change in the regulations governing the configurations and weight limits of vehicles which may use the relevant highway. The impact of such changes would generally have been assessed by the department for transport or National Highways and guidelines issued to authorities on the actions to be taken
- the hierarchy of the road carried by the structure has changed or is proposed to be changed. The change may modify the density and type of traffic carried resulting in a change to the ‘loading class’ defined in cs 454 the assessment of highway bridges and structures
- records of the original design or subsequent assessment do not exist or have become discredited

- the structure has been modified or is proposed to be modified
- the structure is on a route proposed for an abnormal load movement, either a special-order vehicle or an un-common Special Type General Order (STGO) vehicle, for which the structure has not been previously assessed
- significant deterioration or damage has been identified by an inspection. Conditions considered would include those found in structures such as arches which may be susceptible to changing condition factors.

5.6.2. Structural reviews are recommended to follow alternate Principal Inspections when these are done at the frequency included in the Inspection Manual for Highway Structures. We will undertake Structural Reviews every two Principal Inspections. Where appropriate, a structural review may result in the need for a full structural bridge assessment

6. Programming and priorities

6.1. Introduction

6.1.1. Programming and priorities are prescribed within the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B. The general principles to be applied to programming and priorities are outlined in Volume 1 of this Plan, with this section covering guidance relating to structures.

6.1.2. The maintenance planning and management process enables our Structures Manager to deliver our long-term goals and objectives by developing maintenance plans that align with and provide detail to the work volumes and phasing identified in the Asset Management Framework.

6.2. Classification of Works

6.2.1. Three classifications have been made to describe the current operational standard for Structures:

- routine maintenance
- reactive maintenance
- programmed major maintenance

6.3. Routine Maintenance

6.3.1. We have established an appropriate routine maintenance regime for highway structures. In doing so particular consideration is given to the following points:

6.3.2. Planned routine electrical, hydraulic and mechanical maintenance of moving bridges, carried out by specialist contractors. This is a significant commitment and undertaking for the Cross Keys Swing Bridge.

6.3.3. Planned routine electrical and mechanical maintenance of pumps used to drain subways, carried out by specialist contractors.

6.3.4. Minor maintenance is carried out by the Term Service contractor's two maintenance gangs for small Structures and safety fence items generated by bridge inspections and third-party reports.

6.4. Reactive Maintenance

6.4.1. We will reactively respond to any defects on our network, in accordance with our designated response times. Defects will usually be passed on to the Structures team in two ways: through inspections undertaken by Structures or Highways Inspectors or noticed by members of the public. For Structures, all defects will be inspected by a delegated Inspector and subsequently put on a planned programme regime and dealt with as soon as is reasonably practicable.

6.4.2. Removal of graffiti – where graffiti on a highway structure is offensive or obscene, we will remove it as soon as practicable. Non-offensive graffiti may be removed during other planned maintenance works.

6.4.3. We are suitably prepared for urgent safety and stability concerns and emergencies and deal with them effectively when they occur. An emergency response procedure has been developed for this purpose and documented through the Network Resilience Team, and an associated emergency budget determined.

6.4.4. We will further have a reactive response to our road restraint systems in terms of safety barriers. If the damage is safety critical, we will aim to make safe as soon as possible and repair within seven days if reasonably practicable.

7. Programmed Major Maintenance

7.1. The Planning Process

7.1.1. The overarching elements for the Structures team to consider their planning process are the structure's ability to be safe to use and fit for purpose for its user.

7.1.2. They therefore consider the public safety, its location on the road network and the ease of access for the user. Its principal concern is the effect any issue may have on the local population and Lincolnshire's economy.

7.1.3. Relevant condition and performance inputs to the maintenance planning and management process include:

- inspection, testing and monitoring
- assessment of structures through structural reviews

- incidents, emergencies and reports from the police or public

7.1.4. The asset inventory, condition and performance data are used to determine the current performance of the highway structures in a way that supports the identification of needs. These needs can be identified through up-to-date Condition and Performance Data, Lifecycle planning and regular maintenance intervals.

7.1.5. The Structures Manager should periodically review the condition and performance data to identify maintenance needs. It is recommended that General Inspection pro forma are reviewed and signed off no longer than two months after the inspection.

7.2. Lifecycle Plans

7.2.1. Lifecycle plans shall be used to identify needs on specific structures and elements. The cyclic or intervention rules established in the lifecycle plans are compared against the current condition and performance of a structure or element and the specific characteristics of the structure are assessed to determine if the lifecycle plan activity is appropriate.

7.2.2. Lifecycle plans are developed using whole life costing in order to establish the most cost-effective approach alongside asset performance and network safety. For more information on Lifecycle Planning, please refer to the Structures section in the Highways Infrastructure Asset Management Strategy.

7.3. Works Programme

7.3.1. The structures workbank (works programme for Structures) is a database of all work that is currently outstanding on the network, including estimated costs for doing the work. It is recognised that certain work types by their very nature, re-active maintenance for example, cannot be planned in detail in advance but the workbank should still include a volume of work for these, albeit on unknown structures, based on past experience and engineering judgement.

7.3.2. The Forward Work Plan is a detailed one-year programme of work. This provides details of the schemes to be carried out in the one-year period and their approximate annual phasing. The Annual and Forward Work Plan are regularly monitored and reviewed to assess work delivery and changing priorities.

7.3.3. The Structures team further has a five-year rolling indicative programme of work, which outlines all identified planned works over the upcoming five years, subject to analysis and approval. This list may alter but provides a solid foundation to instigate a risk-based approach towards all upcoming programmed maintenance.

7.3.4. Feedback from inspections and maintenance work is utilised to improve the accuracy and development of lifecycle plans and maintenance strategies. Out-turn costs should be used to improve work bank cost estimates, whole life costing and asset management planning.

7.3.5. The workbank includes a full list of all maintenance required on the structures stock. The workbank provides the following information for each item of work:

- name and number or reference of the structure
- element where work is required
- defect, including severity and extent (if appropriate)
- required work
- work type
- recommendation for when the work should be undertaken, for example, which year
- estimated cost

7.4. Value Management

7.4.1. We prioritise the identified needs compiled in the structures workbank.

7.4.2. Value Management is the evidence provided by the Structures Team, by highlighting the reasoning behind the prioritisation of schemes within its workbank on a risk-based approach. It enables engineers readily to compare and identify a priority score for all schemes taking into account budgetary and conditional considerations, whilst ensuring network safety and structural solidity. Further socio-economic and environmental factors are also taken into consideration. The indicative works programme is reviewed annually to generate a one year Forward Work Plan.

7.4.3. Factors considered in scheme selection include:

- position on the carriageway, footway, cycleway or PROW hierarchy
- public safety implications
- financial implications of the work
- implications of not acting, or delaying action
- type of asset, for example, bridge, tunnel, retaining wall, earth structure
- obstacle crossed, bridge span, retained earth height
- critical asset, historic structure, permanent weight, height, width or swept path restriction
- construction material, for example, concrete or steel bridge, arch, slab or beam or girder bridge, concrete or stone walls
- local factors

7.5. Value Engineering

7.5.1. Value Engineering is the process of developing an optimal solution to a maintenance need and reducing waste and inefficient aspects of design, construction and maintenance. Value

Engineering takes the prioritised needs from the Value Management exercise and creates cost effective schemes that can be planned, scheduled and implemented.

7.5.2. The two key components of Value Engineering are option appraisal and scheme development. Important criteria that feed into these components include maintenance options and standards, Whole Life Costing and synergies with other schemes.

7.5.3. Option appraisal is necessary to identify the appropriate maintenance solution when there is more than one practical alternative for addressing the maintenance need. Scheme development is the effective combination of individual work items into schemes, in which each item makes best use of available funding and resources.

7.5.4. The full Value Engineering process is only appropriate for major schemes, but a simplified process should be used to deal with moderate and minor works, where minor works should be grouped into those of a similar type to streamline the process.

7.5.5. We employ multiple methods of Value Engineering, both on a day-to-day basis and for individual schemes. Mostly, throughout the process of the procurement exercises for large schemes, the Contractor will put forward its optimal method which we will review and adjust if required.

7.5.6. We further undertake multiple feasibility studies throughout our processes for Structures schemes. Scheme specific risk reduction meetings are also required to be undertaken to ensure minimal risk and optimal Value for Money for planned major works.

7.5.7. The developed schemes are included within the Forward Work Plan.

Volume 5 – Street Lighting

1. Introduction

1.1. Context of Volume 5

1.1.1. Volume 5 of the HIAMP deals with specific issues and themes regarding Street Lighting within Lincolnshire, in line with Part D of the Well Managed Highway Infrastructure: A Code of Practice (Oct 2016).

1.1.2. We, as a highway authority, are empowered to light the highways but we do not have a duty to provide lighting for roads. Other local councils, such as City, District and Parish, can adopt powers to provide street lighting.

1.1.3. Street Lighting cover a number of different asset types, these can include:

- lighting columns
- lighting units attached to walls or wooden poles
- heritage columns
- illuminated bollards
- illuminated traffic signs
- columns and foundations
- brackets
- luminaires
- control equipment, cables
- control gear, switching, internal wiring cabling (within ownership)

1.2. Street Lighting Policy

1.2.1. Our street lighting management and maintenance is supported by a member approved Street Lighting Policy. The policy sets out the Authorities' powers in relation to street lighting and discusses:

- street lighting on existing roads
- street lighting to improve road safety and as an aid to combat crime
- street lighting for new and development roads
- street lighting operation, maintenance and inspection
- shared service provision

1.2.2. Annexes to the policy also cover the criteria and requirements involved with:

- Exemptions for part-night lighting, and the protocol for the reversal of part-night lighting
- street lighting design guide, and street lighting switch off removals
- attachments to street lighting assets
- street lighting on new developments

2. Legal Framework

2.1. Statutory Obligations

2.1.1. All general duties, powers and legislation specifically related to Street Lighting are dealt with in Volume 1 and Appendix E of this HIAMP.

3. Asset Management Information

3.1. Introduction

3.1.1. Asset data management and it's systems are prescribed within the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B and Part C

3.1.2. We operate with the Asset Management System Confirm, which among other assets stores all Street Lighting, Illuminated Signs and Illuminated Bollards.

4. Asset Condition

4.1. Introduction

4.1.1. Street Lighting installations shall be the minimum standard for each class of road and designed in accordance with the recommendations contained in BS:5489 -1:2013 and BS EN 13201-2:2013.

4.1.2. In the interest of economy during the whole life of a street lighting installation designers shall be permitted to manage reasonable relaxations or departures from the recommendations contained in BS 5489 2013

4.1.3. Street lighting associated electrical installations shall comply with: BS 7671 18th edition 2018: The Requirements for Electrical Installations.

4.1.4. LED lamps of colour temperature 3000K or below shall be the preferred light source throughout the county.

5. Inspections

5.1. Introduction

5.1.1. The regime of street lighting inspection is in accordance with the budget priorities. This forms part of an asset management strategy intended to control cost, stay within the law and apply common sense. They comprise:

- immediate attention to any damage or defects which could result in exposed electrical conductors, unsafe lighting column structures or components hanging loose of by its wires that is liable to fall to the ground
- night-time patrols to identify unlit lamps
- repair of faulty lights
- routine maintenance inspections and electrical tests

5.2. Inspection Frequencies

5.2.1. The table below shows our inspection frequencies for Street Lighting.

Inspection type	Frequency
Night-Time Patrols – all night lighting	Every eight weeks
Night-Time Patrols – part night lighting	Every eight weeks October to March only
Lantern (internal and external)	Lantern cleaning is coincidental with routine maintenance inspections
Routine Maintenance	The routine maintenance frequency is six years. A general condition inspection of the whole unit is carried out at the same time and the lamp is changed if appropriate. The current cycle was completed in March 2024 and the next cycle is due to start in April 2026.
Electrical and Structural Testing	Upon commissioning, Street Lighting units are electrically tested in accordance with BS7671 and periodically tested at routine maintenance intervals. New street lighting cable networks will have their electrical earth loop impedance tested at each exit point. Structural defects are noted at the time of routine maintenance. A separate non-destructive structural testing programme is being undertaken

5.2.2. As far as reasonably practicable there is a need to maintain streetlights and illuminated signs to ensure that they are electrically safe, structurally sound, random lamp failures are minimised and to maintain the lumen output of the lamps.

Lamp Type	Description	Expected Burning Hours	Bulk Change Interval
LED	Light Emitting Diode	80,000	80,000
High Pressure Sodium	SONT, SONE, SONI, SONC, PIA	16,000	25,000
Compact Fluorescent	PLT PLL PLS	12,000	25,000
Subway Installations	LED	60,000	60,000
Cosmopolis	COP	16,000	25,000

5.2.3. Night Patrol inspections operate on a Summer and Winter route basis. Due to their midnight switch off, there is insufficient time for effective night patrol of part-night operating lights during the summer months due to the length of daylight hours. Only those lights that operate on an all-night basis are patrolled during the April to October summer period. The whole network of both part and all-night lights is patrolled during the winter period between October and April when daylight hours are much shorter.

5.3. Column Structural Testing

5.3.1. Inspection and testing activity to assess Column Structural Condition is carried out alongside but separate to the regular routine maintenance activity. An Eddy current testing method is used to measure material thickness at the root, base, swage and shaft sections of the lighting column structure and assess any material thickness depletion. A Red / Amber / Green condition methodology is applied to test results, with a green result indicating a re-test within 6 years, and amber result indicating a retest within 3 years, and red result requiring intervention without re-test.

5.3.2. Steel, stainless steel and aluminium street lighting columns over 15 years of age are included for structural testing, which is carried out using the same area and route process used for the regular routine maintenance activity and will continue throughout the term of this HIAMP.

5.3.3. The Eddy current method cannot be used to structurally test lights mounted on brackets attached to wooden poles, bridges and other buildings and structures, or test lighting columns made from concrete or heritage cast iron. For these, visual inspection already included with the routine maintenance activity is the preferred method of identifying the Red / Amber / Green condition assessment.

5.3.4. Test identification and results are made available through the testing company's website and are uploaded to Confirm on a batch basis. The Red / Amber / Green condition methodology is available on a Confirm mapping layer as a visual aid to identify areas of poor column condition.

5.3.5. When a defect is discovered during testing and inspection, the level of risk depending on the nature and severity is assessed on site. Where a defect is found to be excessive or assessed and notified as dangerous, intervention to 'make safe' the lighting column will be escalated through the 5 day works process but with a manually generated immediate works Streetworks notice.

5.3.6. Intervention to address any lighting columns not found to be dangerous but with a Red or Amber scoring assessment will be prioritised as appropriate either through the reactive maintenance 3 month works process, or through the annual Capital replacement works programme. Where new lighting columns are installed as part of the intervention, the Confirm condition parameters will be adjusted to update the condition assessment and the details shared with the testing company.

5.4. Defects

5.4.1. The table below shows our defect responses for Street Lighting.

Emergency Defects – Two Hours
These defects are defined as electrical, structural or lighting defects that present an immediate danger to the highway user. • accident damage or vandalism where live cables or voltage may be exposed or cause a column to become live • doors open or missing from street lighting columns, illuminated signs or feeder pillars • lighting point structural defect caused by, RTA, vandalism or bad weather conditions • column or illuminated signpost collapse or in imminent danger of collapse • illuminated traffic bollard down or missing • lanterns on street lighting columns or illuminated signs hanging by the supply cable • lantern Bowl hanging The initial intent of an emergency response is to make safe, wherever possible the defect will be repaired at this time but will likely be de-escalated following intervention for further planned works.

Defects requiring repair or report within 22 hours of the contractor's receipt of an instruction

Defects which are less serious than an emergency and in the case of lighting faults it would be unreasonable to expect the job to be serviced during the hours of darkness.

- both lights on a set of Belisha Beacons inoperative.
- a bowl missing from a Belisha Beacon.
- all lighting out on normally lit street of three or more.
- five or more consecutive lights out on a road.
- both flashing lights on a single post of a school patrol inoperative.
- both lens of school flashers broken
- where a STOP, GIVE WAY or NO ENTRY regulatory sign is missing or facing in the wrong direction.

Operatives will attempt to repair the defect but if unable to do so (due to other specialist equipment or parts) will record and report to us with the intent of a future repair as soon as practicable.

Defects requiring non routine repairs – 5 day response

Defects discovered during column testing and inspection, where the inherent level of risk depending on the nature and severity of the defect is assessed on site to be excessive or assessed and notified separately as dangerous.

An excessive or dangerous defect may affect any combination of the root, base, swage, shaft or bracket sections of a column, and consist of such things as:

- Excessive corrosion or perforation
- Accident damage or vandalism
- Poor or deteriorated backing board
- Poor or deteriorated electrical component condition
- Unsecure bracket or lantern fixing

Make safe of the lighting column will require a manually generated job and immediate works Streetworks notice. The 5 day response allows where possible for a replacement column and lantern to be installed as part of the immediate works notice. Reconnection of the electricity supply and any permanent re-instatement will be arranged separately as planned works.

Defects requiring non routine repairs –10-day response

Other defects identified by night patrol or by members of the public either through the CSC, online, or via apps such as FixMyStreet which are not classed as an emergency are issued on a daily basis and include:

- lamp out
- light dim or red
- light flickering

Defects requiring non routine repairs – one month response

Defects that are classed as a lower priority, require specific materials with a longer lead-time, or are a follow-up to an initial visit where further fault repair has been identified. Addressing these defects with a one-month priority allows time for specific materials with a longer lead-time to be procured, and the work to be scheduled effectively with a high level of flexibility.

Defects identified by night patrol or by members of the public either through the CSC, online or via apps such as FixMyStreet classed as lower priority would include:

- general enquiry
- day-burner
- re-align lantern / light unit
- re-align sign plate
- paint back of bowl / fit shield
- remove graffiti (non-offensive)

Repairs identified as requiring specific materials with a longer lead time or are a follow-up to an initial visit where further fault repair has been identified would include:

- out of hours access required
- replace lantern / light unit
- replace sign plate
- replace base compartment door
- new bollard bodyshell
- new number label

5.4.2. Electricity supply faults are reported to and restored by the electricity company. The service level is for the supply to be restored within 25 working days from the date the fault

is notified to the Electricity Company. In practice, some electricity supply faults may take longer than 25 'calendar' working days to restore where site conditions or other restrictions prevent the Electricity Company accessing the site. In these circumstances, the count of the 25-working day service level 'stops' and resumes again once access to the site is available.

5.4.3. Overgrowth of adjacent foliage poses a major risk to the proper operation and visibility of street lighting and traffic signs as well as a safety issue for operatives accessing the equipment.

5.4.4. Where an urgent situation develops, for example a fallen tree, this is escalated to the local area Highways team to be dealt with by their emergency response team.

5.4.5. Other obstructions involving overgrown foliage are recorded either as a defect during routine night patrols, as an enquiry from our officers or members of the public, or as a follow up reported by operatives attending repair works. Operatives are equipped to carry out light pruning where necessary around lighting lanterns, traffic sign faces and base compartment access doors whilst on site, but they are limited in the amount of foliage they can remove.

5.4.6. Where light pruning is not sufficient, the overgrowth is first inspected and then an investigation establishes whether the foliage is from planting within Highway or from private land. If it is found to be from planting within Highway the report is brought to the attention of the local highways officer to be dealt with by the area maintenance teams. Where it is found to be from private land, a standard letter format is prepared and sent to the owner advising them of their legal obligation under section 154 of the Highways Act to remove the overgrowth. After due legal process has been followed and as a last resort, as a Highway Authority the foliage can be removed, and the costs involved recovered from the owner through the courts.

5.5. Cleaning Cycles

5.5.1. Due to the high volume of LED switch out that is occurring on the network, the lamp cleaning cycle has been temporarily paused as the entire unit (including glass) is being replaced on a large volume of assets. The cleanse programme is due to re-commence 2026 once the LED replacement programme is complete.

Design equipment category	Cleaning intervals (months)
Street lighting units	72
Traffic sign lighting units	72
Illuminated traffic bollards	12

5.6. Illuminated Traffic Signs and Internally Lit Traffic Bollards

5.6.1. The primary objective is to keep illuminated traffic signs legible, visible and effective. The approach outlined in 5.5.1 allows us to meet the objectives of the policy and deliver change in a way that offers value for money. For Illuminated bollard cleaning where the surround is not being replaced through the LED switch out process, cleansing will take place during routine maintenance operations. The maintenance regime for illuminated bollard shells is indicated in the Table below.

Maintenance type	**Maintenance interval**
Night scouting for illumination	In conjunction with street lighting inspections
Routine maintenance	Interval is six years in conjunction with Street Lighting inspections. 24 hour burning lamps within illuminated bollards are changed every year except for LED lights which burn to extinction.
Inspections, cleaning and electrical testing of illuminated signs and bollards	Takes place during routine maintenance operations.
External cleaning of illuminated bollards	Takes place during routine maintenance operations and annually. Additional cleaning may be dictated by condition.
Replacement and repair of damaged signs and bollards	Respond according to the degree of danger in accordance with 5.3 above.

Volume 6 - Arboriculture

1. Introduction

1.1. Context of volume 6

1.1.1. The purpose of this volume is to define how we manage and inspect our tree stock across the highway network to ensure it is compliant with health and safety legislation and the requirements of the Highways Act 1980.

1.1.2. We are responsible for more than 10,000 trees growing within the highway boundary and also for ensuring that trees outside the highway boundary, but within falling distance, do not present a hazard to our highway users.

1.1.3. Highway trees have many environmental and amenity benefits. They store carbon, provide shade, reduce noise, protect soil from erosion and provide habitats for wildlife. In urban areas they can enhance the space between buildings, reinforcing the area's character and appeal. However, it is also recognised that trees can cause damage to highways and property if not properly maintained.

1.1.4. To ensure a good balance is reached we cooperate with arboriculturists, landscape architects and urban designers to preserve and enhance the range and quality of street trees.

1.1.5. As we continue to develop our highways tree asset management function, this volume will be updated accordingly.

2. Legal Framework

2.1. Statutory Obligations

2.1.1. As a highway authority, we are responsible for, and have a duty to maintain, trees growing along the public highway. This duty arises from Section 41 of the Highways Act 1980 but is mitigated by Section 58 which allows the defence that the Highways Authority has taken such care as is required to ensure that the highway remains safe.

2.1.2. This volume also relates to the continued safety inspections that we carry out to ensure our tree stock is compliant with Health and Safety legislation and the requirements laid out in the Health and Safety at Work Act 1974.

2.1.3. Additional Acts relevant to the HIAMP are outlined in Appendix E of this Plan.

3. Asset Management Information

3.1. Principles and Considerations

3.1.1. Asset data management is an essential part of the Highways Infrastructure Asset Management Strategy and relies on a specific asset management system to enable this. A highway asset management system is essential to deliver an effective and efficient approach to asset management.

3.1.2. Our existing tree inventory is currently stored in our tree management software. We have, however, embarked on a long-term project to enhance and expand the dataset to our Confirm Asset Management System. This will include inventory data and timescales for future cyclic maintenance and inspection. Our intention is to inspect and catalogue all highways trees on a rolling 6-7 year programme.

3.1.3. The benefits of this approach will lead to:

- a managed tree population that benefits the highway network and those that live by or use it
- a significant reduction in the number of enquiries received through the Customer Service Centre or Fix My Street
- many enquiries being able to be resolved at point of contact through access to maintenance records and the cyclic programme schedule
- a reduced spend on emergency callouts
- a planned and programmed approach to tree maintenance, which will ensure we are investing our budgets in the right areas, this approach will assist in more realistic budget forecasting.

3.1.4. As the programme gains momentum, a detailed inventory of the highway tree stock will be collected. Standard inventory data will comprise of the data captured in the Quantified Tree Risk Assessment (QTRA).

4. Asset Condition

4.1. Introduction

4.1.1. Trees on or adjacent to the highway are visually inspected as part of condition surveys and are surveyed using our tree management software. Our tree assets are in generally good condition; however they are only recorded if they have a stem diameter greater than 300mm, are planted within the highway limits, or are within 25m of the highway (private trees).

4.1.2. All highway owned trees and any private trees with defects within 25m of the highway are assessed with a system called Quantified Tree Risk Assessment (QTRA), which is detailed in

section 5 of this volume. Of the 11,000 inspected as part of our QTRA-led programme, only 275 scored as high risk, this is compared to 1264 high risk trees identified as privately owned. We would seek to continue this programme, with the emphasis on collecting data of our highway assets moving forward and gathering information on appropriate maintenance schedules.

4.1.3. We will continue to monitor the safety of our tree stock through our "As Low As Is Reasonable Practicable" (ALARP) led programme, and will expand the scope of the QTRA programme to include all highway tree assets within the network and to start a proactive programme of maintenance to all of our owned trees in addition to continuing to react to urgent safety issues.

5. Safety and Service Inspections

5.1. Inspection, Assessment and Recording

5.1.1. The Well Managed Highway Infrastructure Code of Practice provides guidance to Highway Authorities relating to all aspects of highway maintenance and management, including trees. Although it is not a statutory requirement to comply with this code, it is recommended that it is adopted to demonstrate best practice and to provide a more efficient and effective service.

5.1.2. Our tree stock is currently assessed using a QTRA-led approach but with the limitation that only trees with a diameter greater than 300mm are assessed. We use NVQ level 4+ inspectors for this work to ensure compliance with industry best practice/legal obligations. The scope of this programme will be widened to include all trees within highway limits and our surveyors will recommend cyclic operations to be applied to the trees as part of their survey work. These recommendations will be acted on subject to budget allocation and resource availability.

5.2. Inspection Frequencies

5.2.1. Our tree stock is currently assessed as follows:

Routine Inspections

5.2.2. Routine highway inspections will be undertaken by our Highways Officers as part of the highway safety inspection process, with the frequency of these inspections dependent upon the hierarchical standing of the respective carriageway.

5.2.3. All established trees within the highway are visually inspected as part of a routine inspection to identify obvious potential hazards. Tree defects likely to cause a hazard including surface damage to carriageways, footways and cycleways, associated with root growth will be recorded as part of Safety and Service Inspections for those elements.

5.2.4. Safety and Service inspections undertaken by our Highways Officers incorporate highway trees, including those outside, but within falling distance of the highway. Obvious defects such as gale damage, broken or overhanging limbs and unstable or leaning trunks which endanger the highway are further included within the safety inspection, if the officer judges them to pose a danger to highway users.

5.2.5. We train and provide our Highways Officers with some basic arboricultural guidance, however our arboricultural specialists advise on the appropriate frequency of inspections and works required for each individual street or mature tree that is considered to hold a high risk to users of the network. A separate programme of planned inspections for all trees is undertaken by our arboricultural team, which is detailed below.

Planned Inspections

5.2.6. Planned inspections are carried out by appropriately qualified and knowledgeable arboricultural specialists in accordance with a risk-based programme, with trees being inspected/re-inspected dependent on the risk scores allocated through initial inspections. Our inspection approach is detailed below.

5.2.7. All trees on or adjacent to the highway are surveyed using tree management software with all highways owned trees being recorded if they are planted within the highway limits. Privately owned trees (with defects) within 25m of the highway are also recorded and assessed. All highway owned trees and private trees (with defects) are assessed with QTRA. QTRA is a method of quantifying risk associated with tree failure and requires three variables in order to make the assessment:

- Size of part likely to fail
- Likelihood of failure
- What will be hit (target)

5.2.8. The survey will produce a large amount of data which would be difficult to manage by conventional methods, however by using the QTRA methodology we can easily filter down to the real risks to the highway network and deal with those risks proportionately.

5.2.9. QTRA will give a risk of harm score expressed as a probability such as 1:1000, 1:10,000 etc.

5.2.10. The Health and Safety Executive (HSE) states that a risk of harm score of greater than 1/10,000 is a ‘tolerable’ level of risk that can be imposed on the public for the wider good, where the risk is As Low As Reasonably Practicable (ALARP). The HSE have therefore accepted the use of QTRA, and we have set the intervention level for our tree stock and private trees between 1:1 and 1:10,000.

5.2.11. We will follow this process for the whole network. However, where the risk score from individual trees is greater than 1:10,000 the emphasis will be on the collection of highway trees as assets.

5.2.12. Highway trees identified for safety work through the survey will be dealt with through the highways term contract. For other trees, a safety report will be sent to the owning department for their action. Private Trees with risk of harm scores of 1:1 – 1:10,000 will be enforced through letters and ultimately Section 154 notices where appropriate.

5.2.13. In rural areas work on highway trees will be mainly reactive and limited, other than for safety reasons. Some routine maintenance will be necessary from time to time to maintain the condition of the trees. This will be a matter for local consideration having regard to users and community views.

5.2.14. In urban areas trees have a significant impact on the local environment but can cause damage to highways and property if not properly managed. Our Arboricultural team will co-ordinate a proactive management programme including regular inspections.

5.2.15. The maintenance of hedges ensures that visibility sight lines and road signs are not obscured, this work will mainly be the responsibility of adjoining landowners. We, as a Highway Authority, may undertake work to private hedge lines and highway vegetation to improve visibility of safety signs and signs related to major junctions. Any action taken is in accordance with the requirements of the European Birds Directive (2009) and the Wildlife and Countryside Act (1981), which includes protection for birds & their nests. Significant nature conservation benefits will result from this practice. Any trimming is, as far as possible, done in late winter, to avoid the bird-nesting season and to allow birds and mammals the maximum opportunity to take advantage of any fruits or seed present.

5.3. Problem trees near the Highway

5.3.1. We are empowered through section 154 of the Highways Act 1980 to deal with hedges, trees and shrubs growing on adjacent land which impacts on the safe use of the highway, and we are responsible for ensuring that trees outside the highway boundary, but within falling distance, do not present a hazard to users of the highway.

5.3.2. If an identified issue is not an immediate safety concern, the owner or occupier shall be informed and may be given notice to take action within 28 days. If an immediate safety concern is highlighted, then appropriate action should be taken to make safe immediately. Follow-up action will be necessary after the 28 days have expired if the owner or occupier does not respond appropriately. If necessary, we may undertake the required work and reclaim costs back.

5.3.3. If the highway is obstructed by fallen trees or other debris from private land causing an immediate threat, we will usually clear the obstruction as soon as reasonably practicable without contacting the tree owner. If necessary, the road may be temporarily closed in the interests of public safety until the danger is averted or problem resolved.

5.3.4. Less urgent matters will be prioritised according to the assessed level of risk. This may mean that we may choose to leave the obstruction for the private landowner to remove.

5.3.5. Regardless of with whom the responsibility lies, we will endeavour to rectify or make safe identified hazards within specified time scales dependent on the severity and location of the defect.

5.4. Routine Tree Work

5.4.1. With the exception of fallen and damaged trees that obstruct the highway and/or endanger highway users, non-specialist officers shall always obtain advice from an aboriculturalist regarding any work on trees which need specialist attention, or which have advanced signs of disease, damage or injury.

5.4.2. Where trees are in Conservation Areas, are subject to a Tree Preservation Order (TPO) or are apparently in need of removal, advice must always be sought from an aboriculturalist.

5.5. Highway Obstruction

5.5.1. We, or our partners (under service level agreements), may undertake work, based on an assessment of risk, to trees situated on the highway to maintain a minimum 2.3 metres height clearance (where reasonably feasible) over a footpath associated with a public street, road, or highway. For trees that are privately owned, we may seek enforcement as detailed at paragraph 5.3.2 above.

5.5.2. We, or our partners (under service level agreements), may undertake work, based on an assessment of risk, to a tree situated on the highway to maintain a minimum 5.3 metres height clearance (where reasonable feasible) over the carriageway (associated with a public street, road, or highway). For trees that are privately owned, we may seek enforcement as detailed at paragraph 5.3.2 above.

5.5.3. The obstruction of street lighting and traffic signs can be a major safety risk to users. A process of inspection and investigation has been put in place, which is detailed in Volume 5 of this plan. Trees and other foliage shall be trimmed back to allow the lighting to function properly and the signs to be legible, while maintaining the shape of the tree wherever possible. Any obstructions involving overgrown foliage can be recorded as a defect during routine night patrols, as with enquiries from our officers or members of the public, or as a follow up reported by operatives attending repair works.

5.6. General or minor nuisance

5.6.1. We will not fell or prune trees solely to alleviate problems caused by natural and/or seasonal phenomena, which are largely outside of our control.

5.6.2. There are a variety of potential nuisances associated with trees, most of which are minor or seasonal and considered to be normal and acceptable consequences of living near trees. Examples of such problems are:

- Falling leaves, twigs, sap, blossom, fruit, nuts, bird and insect droppings.

- Germinating seedlings in gardens.
- Leaves falling into gutters, drains or onto flat roofs.
- The build-up of algae on fences, paths or other structures.
- Trees affecting tv, radio signal reception or broadband
- Trees causing shade to property or shading crops

5.6.3. Pruning or removing trees will not be undertaken to facilitate or increase light fall onto preexisting or proposed solar panels. Trees will not be pruned or removed due to pollen, tree sap or other detritus affecting the solar panel(s).

5.6.4. There is no legal right to good tv or radio equipment reception, and in many cases, it is possible to resolve issues of poor reception involving trees by finding a technical solution.

5.7. Council trees affecting private property

5.7.1. Private landowners have a legal right under Common Law to deal with the nuisance associated with trees overhanging their property. This would be the case whether the trees are Council owned or in private ownership.

5.7.2. If branches from a Council tree are overhanging private property, the landowner can cut them back, unless the tree is protected by a Tree Preservation Order (TPO) or is situated in a conservation area. Where works are likely to impact upon trees in a conservation area or protected by a TPO, permission must be sought from the district or borough council conservation officer.

5.7.3. Branches can be cut back to the boundary of the private property but no further. The work must be carried out from the grounds of the private property. Any cuttings must be disposed of and not left on the highway.

5.7.4. Any work undertaken by private individuals must not affect the structural integrity of the tree.

6. Programming and Priorities

6.1. Maintenance Cycles

6.1.1. We intend to establish maintenance cycles for our tree stock according to the following criteria:

Epicormic (basal) growth programme.

6.1.2. This programme will seek to remove all identified epicormic growth from our tree stock annually and will be delivered by our arboricultural team within asset maintenance. The programme will be agreed with the Highway Asset Manager (Arb). It is anticipated that

this programme will principally seek to address the epicormic growth emanating from established Lime (Tilia spp.) trees widely planted in Lincolnshire's towns and villages.

Avenue Management programme

6.1.3. Through the avenue management programme, we will look at whole tree populations within individual streets and set the cyclic maintenance schedules required. The avenue management programme will be very species specific in its infancy as we address the lack of management the tree stock has previously received, however as the programme develops over time, we anticipate including the majority of highway tree assets within this programme.

6.1.4. We own many trees in many different settings, however while we now plant to fit the principle the 'right tree in the right place', a large proportion of our tree inventory comprises of large growing species such as Lime, Poplar, Sycamore and London Plane. When the majority of these trees were originally planted, they were due to be regularly managed through either pollarding or trimming (cyclic maintenance). Many of these trees have since grown out into very large trees, which presents difficulties when they are planted densely and receive little maintenance on residential streets.

6.1.5. We will set a series of specific works that can be defined and costed through existing schedule of rates (SOR's) and data held on our tree inventory. These works are likely to consist of:

- a pollarding programme for existing pollarded trees
- an epicormic growth removal programme
- significant crown reduction work and crown restructuring to establish new high pollards
- a general work package to include crown lifting, deadwood removal, clearance of cables/lights/furniture.
- a package of maintenance works for small trees/new plantings

6.1.6. We will define which trees receive which treatment through assessments of road type and setting. The trees to be included within the programme will be initially selected using their QTRA score (1:1000-1:30,000) and by analysing enquiry data.

<u>Management styles</u>

6.1.7. The avenue management programme will assess tree populations according to the road type and setting and this process will inform the management that individual populations require.

Road Type	**Management style**
Arterial route – City	Boulevard Trees or Formal Pollard

Arterial route – Countryside	Boulevard Trees
Residential street – City	Formal Pollard or Hard Pollard
Residential street – Countryside	Formal Pollard or Hard Pollard
Constrained residential Street	Formal Pollard, Hard Pollard or Maintain
Country lane - Countryside	Boulevard Trees

Boulevard Trees

6.1.8. This provides the best environment for the growing of large sized avenue trees, allowing the trees to achieve their full potential within minimal pruning to achieve highway clearance. This work would usually entail a Crown lift to 5.2m, deadwood removal and branch pruning to clear all cables and streetlighting

Formal pollard

6.1.9. A formal pollard requires hard pruning initially to try and establish an acceptable crown structure. From this, selected shoots can be singled out to form a secondary canopy.

Hard Pollard

6.1.10. A lot of our trees were planted to be hard pollarded, which means reducing the trees to between 2 and 5m high and maintaining the resultant dense shoots on a cycle.

Maintain

6.1.11. This will relate to small trees and those right trees in the right place. It will consist of light pruning over footways and carriageways, formative pruning and addressing cables and street-lighting issues.

6.2. Tree Felling

6.2.1. Significant pruning or felling of trees can be the subject of significant local concern and will only be done with specialist advice and support. The relevant District Council will be informed, and proposed work discussed prior to work on highway trees with TPOs and in conservation areas.

6.2.2. We will avoid felling trees unless it is necessary for the following reasons:

- A dead or diseased tree that is a danger to the public.
- A tree which is lifting at the roots and failure is imminent.
- A tree obstructing or endangering a public highway, right of way, where the obstruction can't be overcome by pruning or other reasonable measures.
- A tree on Council owned land causing an actionable nuisance to an adjoining property, where actual damage to property has been proved to have been caused by the tree, or

clearly if no action is taken, damage will imminently be caused. This does not include general encroachment of branches and roots onto adjoining land where physical contact with buildings or structures is unlikely.

- A tree that is proven to be a contributor to soil shrinkage and serious structural damage, where pruning alone would not provide a solution
- Damage to light structures such as garden walls, paving, etc. is relatively minor and removal of the tree would not normally be acceptable.
- Trees which, in the judgment of our appointed arboriculturist, are clearly of a size and species inappropriate for their location.
- Thinning of trees to prevent overcrowding or removal for habitat improvement and landscape restoration in accordance with a management plan.
- Removal to allow authorised development. It may sometimes be necessary to remove trees to permit a development to take place.

6.2.3. All trees felled as part of our normal operations and our cyclic operations will be replaced. The number of trees planted will be commensurate with the size of the tree felled and if an exact replacement is not practical, we will replant within the local area. The table below details the amount of replacement trees required per tree felled.

Trunk diameter of felled tree	No. of replacements.
0 - 20cms	1
20 - 40cms	2
40 - 60cms	3
60 - 80cms	4
80 - 100cms	5
100cms+	6

6.2.4. Stump grinding or treatment works shall take place once a tree has been removed unless otherwise stated. Stumps are to be removed to as deep as able and the stump shall be ground below the ground level to avoid a trip hazard at a minimum. If stump grinding is not possible the stump shall be treated with poison to avoid regrowing.

6.3. Tree Planting

6.3.1. Close co-operation between arboriculturists, highway engineers, landscape architects, developers and urban designers is essential to preserve and enhance the range and quality of street trees. This ensures that a considered approach has been taken to supporting sufficient species diversity to make the overall town or neighbourhood tree population

more robust to the advent of disease and/or more resilient to climate change. Avenues, boulevards, town squares and formal spaces, and informal rural locations all require the application of different planting principles. Trees and planting may reflect the history, architecture and tradition of places, small pockets of poor-quality planting can undermine the quality of the streetscape.

6.3.2. Street trees and new plantings are not appropriate in every instance. Trees and planting should always form part of the overall urban context, and not be added to or preserved without question. Trees may be planted where trees have not been planted previously particularly in urban areas that have changed use or in areas where historically they were considered unworthy of tree planting.

6.3.3. Any proposed tree planting shall conform to the maxim 'the right tree in the right place' and will consider proximity to existing or planned infrastructure, particularly with regard to street lighting to minimise the risk of shrouding street lights or casting unnecessary shadows on the highway.

Appendix A – Asset Condition Requirements

The following tables set out the nature of contributions made by each element of the network towards safety, serviceability and sustainability.

Condition	Network Safety	Network Serviceability	Network Sustainability
Overall Condition Requirements	complying with statutory obligations meeting users' needs for safety.	ensuring availability achieving integrity maintaining reliability resilience managing condition	minimising cost over time maximising value to the community maximising environmental contribution
Condition of Carriageways	nature, extent and location of surface defects nature and extent of edge defects nature and extent of surface skidding resistance	nature and extent of surface defects ride quality of the surface resilience of the network	surface noise attenuation characteristics nature and extent of surface defects nature and extent of carriageway deflection usage and verge creep
Condition of Footways	nature, extent and location of surface defects nature and extent of kerb and edging defects	nature and extent of surface defects extent of encroachment and weed growth the level of friction provided by the surface the quality of the surface integrity of the network	convenience and ease of use nature extent and location of surface defects extent of damage by over-running and parking rural footways being lost to grass ingress

Condition	Network Safety	Network Serviceability	Network Sustainability
Condition of Cycleways	nature, extent and location of surface defects nature and extent of kerb and edging defects	nature and extent of surface defects extent of encroachment and weed growth the level of friction provided by the surface particularly with regard to ironwork the quality of the surface integrity of the network	convenience and integrity of the network nature extent and location of surface defects extent of damage by over-running and parking cycleways being lost to grass ingress or verge creep due to usage
Condition of Highways Drainage System	accumulation of water on carriageways, footways and cycleways	accumulation of water on carriageways, footways and cycleways	polluted effluent from clearing of highway drainage should not be directed into watercourses authorities have a duty to prevent nuisance and danger to adjoining landowners by flooding and should also work with others in the wider community to minimise the future risk of flooding inadequate drainage of the highway structure will reduce effective life and increase maintenance liability integrity of systems, root ingress, blockage / collapse, exceedance
Condition of Embankments and Cuttings	risk of loose material falling to injure users or damage facility	risk of damage or service interruption	damage or loss of habitat interruption or pollution of watercourse extent of damage and reduced life integrity of structure
Condition of Landscape Areas and Trees	obstruction to user visibility and legibility of traffic signs	potential for service interruption	landscape conservation mitigation of climate change effects

Condition	Network Safety	Network Serviceability	Network Sustainability
	fallen trees or overgrown vegetation that physically obstructs part of the highway falling branches from trees leaf fall from trees causing slippery surface root growth affecting surface regularity	quality of user experience	support for habitat and biodiversity problems of root growth for surface, structure and highway drainage maintaining healthy trees, root severance, ivy clearance
Condition of Fences and Barriers	integrity and location of safety fencing for vehicles, pedestrians and all road users	risk of livestock disrupting traffic	appearance and condition of fencing
Condition of Traffic Signs and Bollards	identification of risk to users separation of potential traffic conflicts	contributes to ease of use contributes to network integrity	support of sustainable transport mode contribution to local economy heavy traffic routing can optimise maintenance
Condition of Road Markings and Studs	route delineation, particularly in darkness and poor weather potential for damage and injury if loose	ease of use, particularly in darkness and bad weather edge delineation to reduce edge damage	support of sustainable transport modes movement of wheel tracking to reduce localised damage
Regulatory Functions	risk to users and adjoining property	minimising and signing of obstruction	inconvenience to disabled people structural damage from parked heavy vehicles

Appendix B – Response Times

The following is a list of response times relating to Highway maintenance activities, which includes but is not limited to items covered in safety inspections. This table forms our risk assessment for intervention levels and response times but in all cases is subject to on-site professional judgement. In all cases these are maximum response times. Any reference to days is calendar days unless otherwise stated.

Escalation Process

These timescales commence at the point in time that we have knowledge of the defect. The highways officer then undertakes a risk assessment and as a consequence categorises the defect. The highways officer has the opportunity to escalate a defect to a two hour make safe. The highways officer further has the opportunity to escalate or de-escalate a defect through a risk-assessment and will be required to evidence the reasoning behind the changes made. Timescales are designed to enable highway defects to be, wherever practicable, actioned by a permanent repair.

The table outlining the timescales will at all points be referring to calendar days, not working days

Carriageways

Categories (mm = depth or height)	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Ironwork collapsed / missing / broken	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours
Ironwork raised / sunken greater than 25mm adjacent a hierarchy 1 and 2 footways	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Ironwork raised / sunken greater than 40mm	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Ironwork raised / sunken less than or equal to 25mm	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Pothole greater than 25mm adjacent a hierarchy 1 or 2 footway	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme

Categories (mm = depth or height)	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Pothole greater than 40mm	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Pothole less than or equal to 40mm	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Other abrupt level difference greater than 40mm	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Edge damage greater than 40mm fully breaking both sides of edge white line	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Edge damage less than or equal to 40mm fully breaking both sides of edge white line	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme

Categories (mm = depth or height)	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Edge damage greater than 40mm encroaching more than 100mm into metalled surface (no white line)	24 hours	24 hours	7 days	7 days	28 days	28 days	90 days	Potential Planned Programme	Potential Planned Programme
Edge damage less than or equal to 40mm encroaching more than 100mm into metalled surface (no white line)	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Missing/Defective road studs	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Severe loss of chippings on carriageway surface	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Surface issues (non-winter maintenance)	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above). Defects in laybys are likely to be deescalated due to reduced risk

Footways

Categories	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4 – Slabbed / Modular	Hierarchy 4
Ironwork Collapsed/missing/broken	24 hours	24 hours	24 hours	24 hours	24 hours
Pothole greater than 25mm	24 hours	7 days	7 days	7 days	28 days
Ironwork raised/sunken greater than 25mm	24 hours	7 days	7 days	7 days	28 days
Trip hazard / other abrupt level difference greater than 25mm	24 hours	7 days	7 days	7 days	28 days
Loose/Rocking/missing kerb stone	24 hours	7 days	7 days	7 days	28 days
Pothole Less than or equal to 25mm	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Trip less than or equal to 25mm	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Ironwork raised/sunken less than or equal to 25mm	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above).

Obstruction

Categories	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Fuel spillage or hazardous material on the highway	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours
Fallen tree/dangerous branch on the highway	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	7 days
Road Traffic Collision	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours
Visibility splays*	7 days	7 days	7 days	7 days	28 days	90 days	90 days	90 days	Potential Planned Programme
Overgrown trees/hedges	28 days	28 days	28 days	28 days	28 days	90 days	90 days	90 days	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above).

* for junctions that serve more than one road hierarchy, the highest hierarchy response time should be used.

Drainage

Categories	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Standing Water: over half carriageway	24 hours	24 hours	24 hours	24 hours	24 hours	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Standing Water: under half carriageway	7 days	7 days	7 days	7 days	28 days	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above).

Signs and Lines

Categories	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Missing or damaged non illuminated Stop, One Way, No Entry, Give Way or other sign type that provides an enforced message or reflects a TRO	7 days	7 days	7 days	7 days	28 days*	90 days*	90 days*	90 days*	Potential Planned Programme
Missing or damaged non illuminated other sign	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Damaged or missing non-illuminated street furniture (our asset)	7 days	7 days	7 days	7 days	28 days	90 days	90 days	90 days	Potential Planned Programme
Give Way / stop line deteriorating	7 days	7 days	7 days	7 days	28 days*	90 days*	90 days*	90 days*	Potential Planned Programme

Categories	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Markings deteriorating	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme	Potential Planned Programme
Offensive graffiti or vandalism to street furniture (our asset)	90 days	90 days	90 days	90 days	90 days	90 days	90 days	Potential Planned Programme	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above).

*for junctions that serve more than one road hierarchy, the highest hierarchy response time should be used

Verges

Categories	Major Road Network	Hierarchy 1	Hierarchy 2	Hierarchy 3	Hierarchy 4	Hierarchy 5	Hierarchy 6	Hierarchy 7	Hierarchy 8
Collapsed verge	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	24 hours	Potential Planned Programme	Potential Planned Programme

Note - Highways officers' decision to instigate the make safe process = two-hour response for all response times. Officers will be given the opportunity to escalate or de-escalate a defect dependant on a risk-assessment (see above).

Appendix C – Future Maintenance Factors

This Table provides factors to consider by designers during the design process, to ensure that adequate consideration is given to future maintenance requirements of schemes. The list is not exhaustive but includes a number of key issues that may need to be addressed.

Scope and Scale

Issue	Check	Action
Intended life of scheme	Is the scheme long life or 'temporary' and likely to be affected by future redevelopment?	Choose materials and products relevant to the life of scheme.
Nature of scheme	Is the scheme a 'unique' prestige project or a 'routine' standard one?	Choose materials and products relevant to the type of scheme.
Scope of scheme	Has the scheme been 'value-managed' to consider all possible marginal benefits?	All 'significant' schemes should be value managed.
Use of scheme	Is the scheme likely to be subjected to particularly 'heavy duty' traffic use with high rates of wear?	Select design and materials to mitigate these affects so far as possible.
Cost of scheme	Have the costs of future maintenance been calculated and included in future budgets?	Identify any extraordinary maintenance costs and report these alongside construction costs.

Design Aspects

Issue	Check	Action
Pedestrians and cyclists	Do footways and cycleways fit the actual paths used?	Redesign to reflect actual paths to avoid erosion and later replacement.

Issue	Check	Action
Heavy goods vehicles	Is footway paving likely to be over-ridden by HGV or other parked vehicles?	Where necessary use heavy duty paving or prevent over-riding to avoid frequent costly replacement.
Grassed and planted areas	Are grassed and planted areas of a size and position to be effectively maintained?	Redesign or remove where necessary to avoid future poor appearance and later resign.
Trees	Have trees been selected and positioned to avoid future problems with roots, obstruction or leaf fall?	Reselect or reposition where necessary to avoid potentially expensive future problems.
Traffic signs	Are traffic signs required to be illuminated or can they be reflectorised?	Maximise use of reflective signs to reduce energy costs, providing an audit trail has been captured with LRSP

Maintenance Operations

Issue	Check	Action
Maintenance regime	Does the scheme require specialist maintenance regime?	Identify cost of specialist regime and, where appropriate, consider cheaper alternatives.
Cleansing	Does the scheme require specialist cleansing regime?	Identify cost of specialist regime and, where appropriate, consider cheaper alternatives.
Traffic management	Will maintenance require special traffic management?	Identify traffic management costs and minimise wherever possible, possible through co-ordination with other works.

Issue	Check	Action
Maintenance access	Is there safe and convenient access for plant and personnel?	Redesign scheme to provide safe and convenient access.

Materials and products

Maintenance Operations	Maintenance Operations	Maintenance Operations
Specialist materials	Are the materials used for the scheme of standard or specialist nature?	If specialist materials used ensure availability of future replacements.
Durability of materials	Does the durability of the materials provide substandard, oblique, sufficient or excessive life?	Select materials relevant to the intended life and nature of the scheme.
Failure mechanism	How will material or product approach the failure condition – slowly or quickly?	Programme safety and service inspections on basis of risk assessment.
Life extension	Are they any processes which could be used to extend useful service life at economic cost?	Investigate cost benefit of using life extension products.
Replacement practicability	Are there likely to be any difficulties in replacing failed sections?	Undertake risk assessment and plan for the likely difficulties.
Replacement cost	Is the cost of replacement likely to be disproportionately high?	Consider alternative materials or products.

Reuse and Recycling

Materials and products	Materials and products	Materials and products
Practicability of reuse	If the scheme is a short life scheme what is the scope reusing materials and products?	Choose re-useable materials and products wherever possible.
Practicability of recycling	What is the scope for recycling materials and products?	Where re-useable materials and products are not appropriate, use recyclable wherever possible.

Appendix D – Glossary

For the purposes of the HIAMP, publicly understood definitions are used for the major parts of the highway. There are also various differences in definitions across the various legal systems in the UK that would be inappropriate to repeat at length. In such cases the English term is used. The table below highlight the main relevant definitions.

Term	Definition
Highway	A right for the public to pass and repass over land. Highways is a broad term which includes roads, streets, carriageways, footpaths, bridleways, restricted byways and byways open to all traffic
Carriageway	Facilities used by motorised vehicles
Footway	Part of a carriageway over which the public have a right of way on foot only, for example, segregated surfaced paths used by pedestrians. Commonly understood as the term pavement
Pavement	Footway
Remote Footway	A footway which is not immediately adjoining a carriageway
Housing Footway	Footways that predominantly serve housing areas which may be unadopted as public highways but have established public rights of access and may be maintained separately by the housing authority
Footpath	A type of highway over which the right of way is on foot only. These are recorded on the Lincolnshire County Council's Definitive Map and Statement of Public Rights of Way.

Term	Definition
Bridleway	A type of highway over which the right of way is on foot, on horseback or leading a horse and by cycle. These are recorded on the Lincolnshire County Council's Definitive Map and Statement of Public Rights of Way.
Restricted Byway	A type of highway over which the right of way is on foot, on horseback or leading a horse, by cycle and by other non-mechanically propelled vehicles such as a horse and cart. These are recorded on the Lincolnshire County Council's Definitive Map and Statement of Public Rights of Way.
Byway open to All Traffic (BOAT)	A carriageway, but one that is used mainly for the purposes for which footpaths and bridleways are used. These are recorded on the Lincolnshire County Council's Definitive Map and Statement of Public Rights of Way.
Cycleway	Facilities used by cyclists. These include cycle lanes on carriageways, cycle tracks adjacent to or away from carriageways, on carriageway provision with cycle symbols and shared use facilities
Running Surface (Industry term)	All hardened surfaces within the highway, including carriageways, footways and cycleways
Pavement (Industry term)	Construction of running surfaces, particularly carriageways
Safety Inspections	Designed to identify all defects likely to create danger or serious inconvenience to users of the network or the wider community. The risk of danger is assessed on site and the defect identified with an appropriate priority response. We combine our Safety and Service inspections into one overlapping inspection regime.
Service Inspections	Contains detailed inspections tailored to the requirements of particular highway assets and elements to ensure that they meet requirements for serviceability. These inspections also include inspections for network integrity intended to maintain network availability and reliability.

Term	Definition
Condition Surveys	Recommended to identify deficiencies which, if untreated, are likely to adversely affect long term performance, serviceability and safety. Survey data is processed through a bespoke Lincolnshire decision support system which can provide evidence of future life expectancy and for when intervention may be appropriate.
Bridge	A structure with a span equal to or greater than 1.5m spanning and providing passage over an obstacle, for example a watercourse, railway, road, or valley. This category also covers subways, footbridges and underpasses
Cantilever Road Sign	A structure with a single support that projects over the highway in order to carry a traffic sign
Cellar or Vault	An underground room or chamber with a maximum plan dimension of 1.5m or more
Culvert	A drainage structure with a span or diameter greater than or equal to 0.6m but less than 1.5m passing beneath a highway embankment that has a proportion of the embankment, rather than a bridge deck, between its uppermost point and the road running courses. Culverts are normally rectangular or circular in cross section
Drainage	Span or diameter less than 0.60m
Retaining Wall	A wall associated with the highway where the dominant function is to act as a retaining structure, and with a minimum retained height of 1.35m
Road Tunnel	A tunnel with an enclosed length of 150m or more through which a road passes
Sign or Signal Gantry	A structure spanning the highway, the primary function of which is to support traffic signs and signalling equipment
General Inspection (Structures)	A visual inspection of representative parts of the structure. These are carried out on all structures regardless of ownership

Term	Definition
Principal Inspection (Structures)	A close inspection (within one metre) of all visible parts of the structure. Specialist access equipment may be required in some cases. Carried out on all County owned structures with a span greater than or equal to five metres. Structures with spans less than five metres will be subject to a risk assessment.
Special Inspection (Structures)	These include a programme of bridges to be monitored following an assessment failure or where there is some on-going movement. In addition, there is a programme of diving inspections where structures are known to be at risk from the effects of scour.
Acceptance Inspection (Structures)	A Principal Inspection which includes the identification of any permanent access provisions and features affecting the safety and security of the structure. It further outlines the identification and handover of all the necessary records, maintenance and operating manuals which have an impact on the future management of the structure and shows an agreement of the date on which the authority takes over responsibility for the structure.

Appendix E – Legislation and Guidance

Volume 1 – Overarching Principles

Legislation and Guidance	Definition
Health and Safety at Work Act 1974	Provide a requirement for highway, traffic and street authorities to carry out work in a safe manner and establish arrangements for the management of construction works.
Construction (Design and Management) Regulations 2015	Provide a requirement for highway, traffic and street authorities to carry out work in a safe manner and establish arrangements for the management of construction works.
Localism Act 2011	Provides local authorities the power, with certain limitations, to do anything that individuals generally may do for the benefit of the authority, its area, or persons resident or present in its area. It also introduced measures such as the community right to challenge.
Local Government Act 2000	Duty of best value and aims to improve local services in terms of both cost and quality. The following points must be taken into consideration: Statutory basis Local Government Act 1999 Best Value Performance Plans Reviews of all services on five-year cycle Statutory Inspection by Audit Commission Statutory Framework of Best Value Performance Indicators
Highways Act 1980	Sets out the main duties and powers of Highway Authorities.
Section 41	Duty to maintain highways maintainable at public expense. Almost all claims against authorities relating to highway functions arise from alleged breach of this section

Legislation and Guidance	Definition
Section 58	Defence against action relating to alleged failure to maintain
Traffic Management Act 2004	Sets out a number of provisions including National Highways Traffic Officers, local authority duty for network management, permits for work on the highway, increased control of utility works, and increased civil enforcement of traffic offences
New Roads and Streetworks Act 1991	Provides a legislative framework for street works by undertakers (including utility companies) and gives various companies and agencies statutory powers and obligations to work in the highway
Countryside and Rights of Way Act 2000	Authorities are required to maintain records and ensure that ways are adequately signposted, maintained and free from obstruction.
Road Traffic Regulation Act 1984	Provides the powers to regulate or restrict TRAFFIC on UK ROADS, in the interest of safety
Traffic Signs Regulations and General Directions 2016	Prescribes the design and conditions of use of traffic signs on or near roads in England, Scotland and Wales.
Road Traffic Act 1988	Provides a duty for Highway Authorities to promote road safety, including a requirement to undertake accident studies and take such measures as appear appropriate to prevent accidents occurring
Road Traffic Reduction Act 1997	Imposes a duty upon local authorities to make reports about traffic levels and anticipated growth in those levels in order to set targets for traffic reduction or at least a reduction in the growth rate
Flood and Water Management Act 2010	Aims to reduce the flood risk associated with extreme weather. Provides for better, more comprehensive management of flood risk for people, homes and businesses
Transport Act 2000	Designation of quiet lanes or a home zone

Legislation and Guidance	Definition
Wildlife and Countryside Act 1981	Environmental and countryside issues with which highways operations must comply
Environmental Protection Act 1990	Provides the statutory basis for other environmental issues, in particular waste management, with which highway maintenance operations must comply
Clean Neighbourhoods and Environment Act 2005	Provides local authorities with more effective powers to tackle poor environmental quality and anti-social behaviour
Equality Act 2010	Legally protects people from discrimination in the workplace and in wider society
Criminal Justice and Public Order Act 1994	
Human Rights Act 1998	Sets out the fundamental rights and freedoms that everyone in the UK is entitled to
Freedom of Information Act 2000	Provides public access to information held by public authorities, who are obliged to publish certain information about their activities. Also, members of the public are entitled to request information from public authorities
Civil Contingencies Act 2004	Delivers a single framework for civil protection in the UK

Some definitions are taken from gov.uk website.

Volume 2 - Highways

Legislation and Guidance	Definition
Highways Act 1980	Sets out the main duties of Highway Authorities in England and Wales
Section 41	Duty to maintain highways maintainable at public expense

Legislation and Guidance	Definition
Section 58	Defence against action relating to alleged failure to maintain
Section 102	Provision of works for protecting highways against hazards of nature
Section 130	Duty to assert and protect the rights of the public
Section 134	Provision of a statutory right to plough over footpaths and bridleways which are not field edge paths.
Section 137	This makes it an offence, liable to a fine, wilfully obstruct the free passage of the highway without lawful authority.
Section 143	Empowers the authority to deal, by notice, with structures that have been placed on the highway without lawful authority, and to recover costs
Section 150	Duty upon authorities to remove any obstruction of the highway resulting from 'accumulation of snow or from the falling down of banks on the side of the highway, or from any other cause'
Section 154	Empowers the authority to deal, by notice, with hedges, trees and shrubs growing on adjacent land which overhang the highway, and to recover costs
Section 239	Acquisition of land for construction, improvement etc of highway: general powers
Section 240	Acquisition of land in connection with construction, improvement etc. of highway: further general powers
Section 250	Land acquisition powers to extend to creation as well as acquisition of rights
Traffic Management Act 2004	Duty for all local traffic authorities in England to manage the network effectively to keep traffic moving

Legislation and Guidance	Definition
New Roads and Street Works Act 1991	Provides a legislative framework for street works by undertakers (including utility companies) and works for road purposes – to the extent that these must be co-ordinated by street authorities.
Roads (Scotland) Act 1984	Duty for local roads authorities to keep a list of 'public roads' and to maintain and manage them
Section 34	A road authority shall take such steps as it considers reasonable to prevent snow and ice endangering the safe passage of pedestrians and vehicles over public roads
Sections 88 and 92	Give roads authorities the responsibility to remove projections which impede or endanger road users, and provide restrictions on planting of trees near carriageways
Railways and Safety Transport Act 2003	To make provision about railways, including tramways; to make provision about transport safety; and for connected purposes.
Roads (Northern Ireland) Order 1993 SI 1993/3160 (NI 15)	
Article 10	Duty for the Department for Infrastructure to remove snow, soil etc which has fallen on a road
Section 9	Enables the authority to take such action as it considers reasonable to prevent snow or ice interfering with the safe passage of persons and vehicles using the road
UKRLG Highway Infrastructure Asset Management Guidance	
The Weeds Act 1959	Empowers DEFRA to serve notice requiring an occupier of land to take action to prevent the spread of certain specified weeds

Legislation and Guidance	Definition
Wildlife and Countryside Protection Act 1981 – Section 14	This makes it an offence, liable to a fine, to plant or otherwise cause to grow in the wild, certain specified weeds
Section 53	Duty to keep the Definitive Map and Statement up to date
Countryside Act 1968 (Section 27)	Duty to signpost public rights of way

Volume 4 – Structures

Legislation and Guidance	Definition
Highways Act 1980	Sets out the main duties of Highway Authorities in England and Wales
Section 41	Duty to maintain highways maintainable at public expense
Section 55	Adoption by the strategic Highway Authority of all private bridges for trunked roads
Section 75(2)	Where any part of a highway is carried by a bridge over a railway, canal, inland navigation, dock or harbour or forms the approaches to such a bridge, the powers conferred by this section shall not be exercised in relation to that part without the consent of the railway, canal, inland navigation, dock or harbour undertakers concerned.
Section 91	Construction of bridge to carry existing highway maintainable at public expense.
Section 92	Reconstruction of bridge maintainable at public expense.
Section 93	Power to make orders as to reconstruction, improvement, etc., of privately maintainable bridges

Legislation and Guidance	Definition
Section 94	Powers of highway authorities and bridge owners to enter into agreements
Section 95	Supplemental provisions as to orders and agreements under sections 93 and 94
Section 106	Orders and schemes providing for construction of bridges over or tunnels under navigable waters
Section 110	Power to divert non-navigable watercourses and to carry out other works on any watercourse
Section 111	Bridges under the highway
Section 167	Powers relating to retaining walls near streets
Section 176	Licences for bridges over the highway
Section 179	Control of construction of cellars etc. under street
Section 180	Control of openings into cellars etc. under streets, and pavement lights and ventilators
Section 271	Provisions with respect to transfer of toll highways to highway authorities
Local Government Act 1972	Advises limited flexible powers for local authorities to provide certain archives services
Trunk Roads Act 1946 – Section 7	Adoption by the strategic Highway Authority of all private bridges for Trunked roads
The Transport Act 1968 – Part VIII	Bridges and level Crossings etc
Traffic Signs Manual Chapter 4	Warning Sign Guidance

Legislation and Guidance	Definition
The Railway Bridges (Load Bearing Standards) (England and Wales) Order 1972 (SI 1072 No. 1705)	Load-bearing standards
ADEPT/Network Rail Protocol	Minimising risk of bridge strikes
BS EN 1991-2	Models of traffic loads for the design of road bridges, footbridges and railway bridges
Road Traffic Regulation Act 1984 – Section 1 and 2	Weight Restriction Orders
The Road Vehicles (Construction and Use) Regulations 1986 or the Road Vehicles (Authorised Weight) Regulations 1998	
CS 454	Assessment of highway bridges and structures document
Roads (Scotland) Act 1984 – Section 66	Maintenance of vaults and cellars etc.
Coast Protection Act 1949 as amended by Section 36 of the Merchant Shipping Act 1988	Safety of navigation
Food and Environmental Protection Act 1985 Part II	Deposits in the sea
Party Wall Act 1996	Requires the issue of statutory notices when work affects adjacent properties within three metres of any construction works or within six metres if affecting foundation support
Climate Change Act 2008	Sets national targets for the year 2050 for the reduction of greenhouse gas emissions

Legislation and Guidance	Definition
Planning (Listed Building and Conservation Areas) Act 1990	Requires each authority to compile a list of buildings of special interest, either historic or architectural

Volume 5 – Street Lighting

Legislation and Guidance	Definition
Highways Act 1980	Sets out the main duties of Highway Authorities in England and Wales
Section 97	Empowers us to light any highway or proposed highway however does not have a duty to provide lighting for highway
Section 38/278	Street Lighting will normally be provided by the developer and adopted by us. On section 38 schemes, street lighting shall be part-night lit
Public Health Act 1961	
Section 45	Attachment of street lamps to buildings
Section 81	Summary recovery of damages for negligence
Roads (Northern Ireland) Order 1993 – Article 44	Grants the Department for Infrastructure the power to provide road lighting, where the Department considers that any road should be illuminated.
Roads (Scotland) Act 1984 – Section 35	Empowers a local roads authority to provide lighting for roads, or proposed roads, which are, or will be, maintainable by them and which in their opinion ought to be lit.
New Roads and Street Works Act 1991	Enabling act setting out the duties of Street Authorities to coordinate and regulate works carried out in the highway

Legislation and Guidance	Definition
Electricity Safety, Quality and Continuity Regulations 2002	Recording of all underground cables
Code of Practice for Recording of Underground Apparatus in Streets.	Recording of all underground cables
Clean Neighbourhoods and Environment Act 2005 – Section 102	States that artificial light is a potential statutory nuisance
Conservation (Natural Habitats, &c) Regulations 1994 **2007 European Protected Species of Plants and Animals**	Protected species on artificial lights receive protection under these legislations. Care needs to be taken not to disturb the animals themselves or their roosts and habitats. Guidance is Available from the Bat Conservation Trust and the Institution of Lighting Professionals.
Traffic Management Act 2004	Local Authorities have a duty to enforce network management for the maintenance of records and information (for example, records and locations of apparatus) and to inspect the records
Climate Change Act 2008	Empowers the government to set national targets for the year 2050 for the reduction of greenhouse gas emissions and to encourage energy users to meet the objectives of the Act, such as reducing such emissions or removing greenhouse gas from the atmosphere. The Act also introduces legally binding carbon budgets, which set a ceiling on the levels of greenhouse gases that can be emitted into the atmosphere. The ensuing Carbon Reduction Commitment was renamed to CRC Energy Efficiency Scheme.
Crime and Disorder Act 1998 – Section 17	Duty to consider crime and disorder implications. The Crime and Disorder Act does not apply to Scotland or Northern Ireland.
Traffic Signs Regulations and General Directions 2016	Prescribes the design and conditions of use of traffic signs on or near roads in England, Scotland and Wales.

Legislation and Guidance	Definition
Civic Amenities Act 1967	Gave legislative control to the protection of conservation areas which are defined as - 'an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance.'
Electricity at Work Regulations 1989	Requires all systems to be constructed, maintained and operated as is reasonably practicable to prevent danger.
BS 7671 Requirements for Electrical Installations	States that installations which conform to the standards laid down in BS 7671:2018 are regarded by HSE as likely to achieve conformity with the relevant parts of the Electricity at Work Regulations 1989
Regulation 16 of the Electricity at Work Regulations	States that "No person shall be engaged in any work activity where technical knowledge or experience is necessary to prevent danger or where appropriate, injury, unless he possesses such knowledge or experience, or is under such degree of supervision as may be appropriate having regard to the nature of the work"

Appendix F – Action Plan

Action Name	Description	Timescale
Cycleway Focus	Identify cycleway locations, consider establishing unique asset identification and review defect categories and response times.	October 2025
Response Times Development	Continually monitor suitability of current response times and deal with any requests for change.	Ongoing
Boundary Alignment	We will continue to engage with all neighbouring authorities to ensure all surrounding authorities are aware of the boundary roads and each other's response times.	Ongoing
Drainage Asset Capture – develop targeted approach	Continue to improve the targeted approach to drainage and gully cleansing with contingency for flooding or prolonged periods of rain. To capture more data	Ongoing
Safety and Service Inspections	Monitor effectiveness of real time risk assessment and works ordering through handheld devices both for inspectors and contractor side.	Ongoing
Resilient Network Review	Full review of the Resilient Network	July 2025
Network and Traffic Management Plan	Full review of the Network and Traffic Management Plan along with the Speed Limit Policy, Traffic Calming Guidance and Traffic Regulation Order Policy	Ongoing
Highway Policy Review	Commence a review of all policies, strategies and plans within highways ensuring that all are still relevant, up to date and published in the relevant places	Ongoing
Rights of Way Improvement Plan (RoWIP)	Review of the existing Rights of Way Improvement Plan and development of a revised RoWIP for 2025	Sept 2025