

# Highways Infrastructure Asset Management Plan 2021



April 2021

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## 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 Lincolnshire County.

Lincolnshire County Council has for some time been committed to developing a consistent, proactive approach towards our service. Therefore, the Authority is 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 the Lincolnshire County Council Highways Service. Therefore the Plan has been divided up into a Highways, Structures and Street Lighting 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 Davies***





*Executive Councillor: Highways, Transport and IT*

# Highways Infrastructure Asset Management Plan

VOLUME 0 – OVERARCHING PRINCIPLES



## 1. INTRODUCTION

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### 1.1. PRINCIPLES AND CONTEXT OF THE PLAN

- 1.1.1. This document replaces the Highway Infrastructure Asset Management Plan (April 2020) and applies to all of Lincolnshire County Council's Highway Assets.
- 1.1.2. The Highway Infrastructure Asset Management Plan is produced as a single Plan spanning 4 Volumes to emphasise an integrated approach to highway network infrastructure assets. Overarching matters are dealt with in Volume 0 and additional asset-specific matters are dealt with in volumes 1, 2 and 3. This approach is consistent with the Highways 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 for Lincolnshire County Council in line with local needs and priorities. There has been a shift from the previous guidance set out in *Well Maintained 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 and is approved by the Council's Executive processes.

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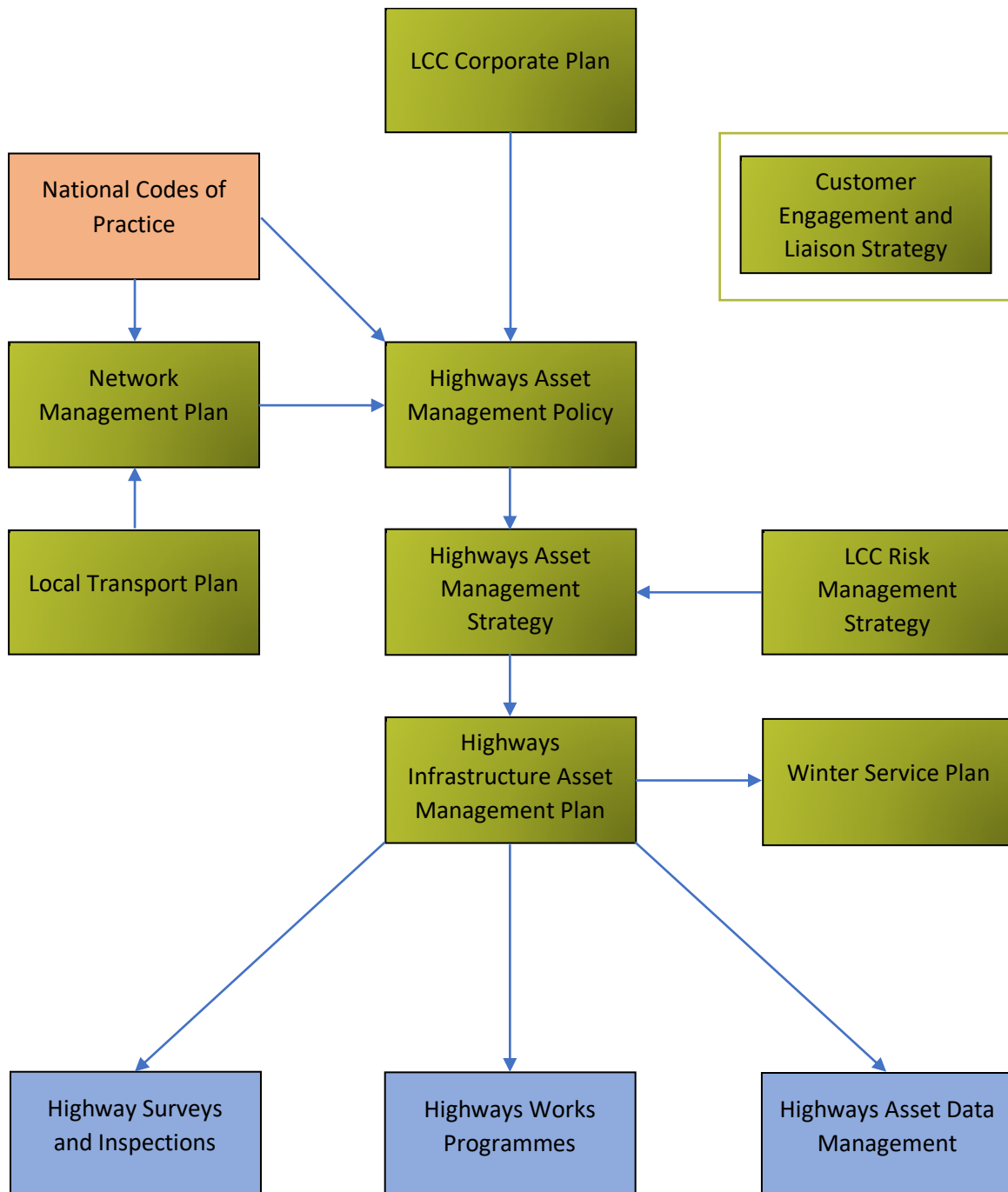
### 1.2. STATUS OF THE PLAN

- 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 a yearly 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 Highways Infrastructure Asset Management Plan forms part of a suite of documents which define Lincolnshire County Council's Asset Management Policies. The links to other documents are set out in the diagram below:



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#### 1.4. MAINTENANCE PRACTICE

- 1.4.1. Lincolnshire County Council undertakes 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) e.g. lamp replacement, drainage cleansing, grass cutting and sign face cleaning etc.
  - **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.

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#### 1.5. SCOPE OF THE PLAN

- 1.5.1. The document will comprise of 3 Volumes, each outlining a specific Asset Group. The 3 Asset Groups are:
- Highways
  - Structures
  - Street Lighting
- 1.5.2. 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 demands of good life-cycle planning outlined within the Asset Management Strategy.

1.5.3. The Highways Infrastructure Asset Management Plan 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 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) define 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. Lincolnshire County Council is committed to the development of an Asset Management led approach to the maintenance of highways infrastructure assets. This is highlighted by our continual Level 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. Lincolnshire's *Highways Asset Management Policy* and *Highways Asset Management Strategy* set out the high-level principles of the management of the highways 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 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 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* may be regarded as a relevant consideration. Where, in the light of local circumstances, Lincolnshire County Council has 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. Lincolnshire County Council Highways has developed an Asset Management Policy document, outlining its approach towards effective asset management in line with the member-approved commissioning strategies developed by the Authority as a whole.
- 2.1.8. Lincolnshire County Council Highways has further developed an Asset Management Strategy, outlining its approach towards formalising strategies for investment in key highway asset groups through life-cycle planning, defining affordable service standards, improving how the highway assets are managed and subsequently enabling more effective and efficient highways services to be delivered.

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## 2.2. STAKEHOLDERS AND COMMUNICATION

- 2.2.1. Stakeholder expectations and effective customer communication are highly important to Lincolnshire County Council, with a Communication Policy and Strategy in place for the authority. This has driven the Customer Communication 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 the *Highways Asset Management Strategy*.

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## 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 new 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 Authority boundaries, e.g. river bridges, has been agreed with adjoining authorities. Lincolnshire County Council has outlined all its boundaries with adjacent Local Authorities and included them within its Asset Management System.
- 2.3.3. Lincolnshire County Council has entered into agreements with adjacent authorities for certain aspects of service to be carried out by one Council on behalf of the other. Specific shared Gritting Route responsibilities can be found in the Winter Maintenance Plan.

### 3. LEGAL FRAMEWORK

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#### 3.1. GENERAL AND SPECIFIC REQUIREMENTS

- 3.1.1. All duties, powers and legislation, both general and specifically related to assets, e.g. highways, structures and lighting 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 Lincolnshire County Council 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. LINCOLNSHIRE HIGHWAY ASSET MANAGEMENT STRATEGY

- 4.1.1. Lincolnshire County Council's *Highways Asset Management Strategy* has been developed in line with the UKRLG *Highway Infrastructure Asset Management Guidance (HIAMG)*, Part B.
- 4.1.2. The *Highways Asset Management Strategy* sets out how the Highways 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 a Highways Infrastructure Asset Management Plan (HIAMP) shows that the Authority is delivering value when maintaining highways as well as addressing wider objectives of corporate strategy and transport policy.
- 4.1.4. The HIAMP will be a key component of the Asset Management Strategy and will include such items as:
- A set of objectives and policies linked to business objectives (See Appendix E of this Plan) through Network Safety, Customer Service, Network Serviceability and Network Sustainability.
  - An asset or inventory register.
  - Managing risk of failure or loss of use.
  - Development of co-ordinated forward programme for highway maintenance, operation and improvement.
  - Measurements of performance and continuous improvement.
- 4.1.5. Lincolnshire County Council adheres to the HMEP (Highways Maintenance Efficiency Programme) 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.
- 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 taxpayers.

- 4.1.7. Lincolnshire County Council has adopted, where affordable, recommendations which add value to current practices.
- 4.1.8. The pothole review and asset management guidance products produced by HMEP 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 Lincolnshire County Council. 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.

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## 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 below 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 9,213 km's of carriageway. The network also comprises 4,377 Km's, 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, the County Council has 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.

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#### 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 Lincolnshire County Council's local maintenance hierarchies.

| LCC Local Standard   | National Standard  |
|--|--|
| <p><b>Major Road Network</b></p> <p>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.</p> <p><i>Major Road Network in Lincolnshire to include:</i></p> <ul style="list-style-type: none"> <li>▪ <i>A15 (M180 to Sleaford)</i></li> <li>▪ <i>A16</i></li> <li>▪ <i>A17</i></li> <li>▪ <i>A52 (Boston – Skegness)</i></li> <li>▪ <i>A57 (Dunham bridge from A1 – Lincoln)</i></li> <li>▪ <i>A46 (Lincoln Saxilby Road Roundabout to Nettleham Road roundabout)</i></li> <li>▪ <i>A151</i></li> <li>▪ <i>A158</i></li> </ul> | <p><b>Category 2 - Strategic Route</b></p> <p><i>Trunk and some Principal “A” roads between Primary Destinations</i></p> <p>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.</p> |

| LCC Local Standard  | National Standard   |
|---|---|
| <p><b>Hierarchy 1</b></p> <p>Major long distance, inter-urban routes, which either:</p> <ul style="list-style-type: none"> <li>– Provide a network of routes for traffic passing through the county,</li> <li>– Link major urban areas (over 8000 population) to major urban areas outside the county</li> </ul> <p>Particularly for long distance through industrial and commercial traffic.</p> | <p><b>Strategic Route</b></p> <p><i>Trunk and some Principal “A” roads between Primary Destinations</i></p> <p>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.</p> |
| <p><b>Hierarchy 2</b></p> <p>The remaining inter-urban routes of more than local importance by virtue of their role in handling substantial flows of long distance traffic between:</p> <ul style="list-style-type: none"> <li>– Adjacent towns within the county.</li> <li>– Lincolnshire towns near the county boundary and nearby centres of populations in adjacent counties.</li> </ul>      | <p><b>Main Distributor</b></p> <p><i>Major urban and Inter-Primary links. Short to medium distance traffic.</i></p> <p>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.</p>       |

| LCC Local Standard  | National Standard   |
|---|---|
| <p><b>Hierarchy 3</b></p> <p>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.</p> | <p><b>Secondary Distributor</b></p> <p><i>B and C class roads and some unclassified urban routes carrying bus, HGV and local traffic with frontage access and frequent junctions</i></p> <p>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.</p> |
| <p><b>Hierarchy 4</b></p> <p>Classified roads, which link the smaller villages and settlements to the MRN, H1, H2 or H3 roads.</p>  | <p><b>Link Roads</b></p> <p><i>Roads linking between the Main and Secondary Distributor Network with frontage access and frequent junctions</i></p> <p>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.</p>   |



| LCC Local Standard   | National Standard   |
|--|---|
| <p><b>Hierarchy 5</b></p> <p>Unclassified roads, which link the smaller villages and settlements to the MRN, H1, H2 or H3 roads.</p>                             | <p><b>Link Roads</b></p> <p><i>Roads linking between the Main and Secondary Distributor Network with frontage access and frequent junctions</i></p> <p>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.</p> |
| <p><b>Hierarchy 6</b></p> <p>Urban and rural roads whose main purpose is to provide access to residential properties or provide access to agricultural land.</p> | <p><b>Local Access Road</b></p> <p><i>Roads serving limited numbers of properties carrying only access traffic.</i></p> <p>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.</p>   |

| LCC Local Standard   | National Standard  |
|--|--|
| <p><b>Hierarchy 7</b></p> <p>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.</p> | <p><b>Minor Roads</b></p> <p><i>Little used roads serving very limited numbers of properties.</i></p> <p>They are locally defined</p>  |
| <p><b>Hierarchy 8</b></p> <p>The remaining Unclassified Roads, which although we are liable for in terms of maintenance are un-metalled.</p>   | <p><b>Minor Roads</b></p> <p><i>Little used roads serving very limited numbers of properties.</i></p> <p>They are locally defined.</p> |

Assignment of a carriageway to a particular category 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 Maintenance Plan);
- designation as a traffic sensitive route;
- accident and other risk assessment;
- potential for use as a diversion route;
- special characteristic of certain assets, e.g. historic structures;
- access to schools, hospitals and medical centres;
- vulnerable users or people with special needs, elderly people's homes etc; and
- ceremonial routes and special events.

#### 4.4. FOOTWAY AND CYCLEWAY HIERARCHY

Footway Hierarchy is determined by functionality and scale of use. Table 2 sets out Lincolnshire County Council's local hierarchies.

| LCC Local Standard   | National Standard  |
|--|--|
| <p><b>Hierarchy 1</b></p> <ul style="list-style-type: none"> <li>– Footways in the main shopping street of the urban areas of towns</li> <li>– Pedestrianised shopping streets in the urban areas of towns listed in the structure plan.</li> </ul> <p>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.</p> | <p><b>Primary Walking Routes</b></p> <p>Busy urban shopping and business areas and main pedestrian routes.</p> |

| LCC Local Standard  | National Standard  |
|---|--|
| <p><b>Hierarchy 2</b></p> <ul style="list-style-type: none"> <li>– Footways along main pedestrian routes just outside the main shopping area but within the central areas of towns listed in the structure plan.</li> <li>- Local shopping streets in settlements not listed in the structure plan where there is a linear shopping development to 10 retail units or more within a 100 metre length.</li> <li>– Footways remote from the carriageway linking main shopping streets (Hierarchy 1) to other areas e.g. pedestrian access to car park etc.</li> </ul> | <p><b>Secondary Walking Routes</b></p> <p>Medium usage routes through local areas feeding into primary routes, local shopping centres etc.</p> |
| <p><b>Hierarchy 3</b></p> <p>Linking local access footways through urban areas and busy rural footways.</p>   | <p><b>Link Footways</b></p> <p>Linking local access footways through urban areas and busy rural footways.</p>                                  |
| <p><b>Hierarchy 4</b></p> <p>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.</p>  | <p><b>Local Access Footways</b></p> <p>Footways associated with low usage, short estate roads to the main routes and cul-de-sacs.</p>          |

Assignment of a footway to a category 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.

4.4.1. 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 be incorporated in the footway hierarchy, irrespective of their designation.

4.4.2. Cycle Routes 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.

4.4.3. 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.

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#### 4.5. LIFECYCLE PLANNING

4.5.1. The objectives of lifecycle planning are stated by the UK Roads Liaison 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 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 and signals) to maintain the required levels of service at the lowest whole life cost.

4.5.3. The County Council has 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. Lincolnshire County Council has reviewed and evaluated various options to assist with lifecycle planning. Following detailed evaluation of options, the county council decided to build upon its 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 1, section 6 or the Highways 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.

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#### 4.6. ROAD/RAIL INCURSION

4.6.1. Lincolnshire County Council 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. The Council 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 maintained by Lincolnshire County Council will be accurate and effectively managed.
- 5.1.2. Various Highways Guidance Documents (HGD's), detail the internal procedures that will be adhered to ensure the effective management of records relevant to highway maintenance.
- 5.1.3. The QMS (Quality Management System) has been implemented for the effective management of documents and records, which structures areas to complement the layout of Highways organisational structure and contains links to other areas, HGDs and Health and Safety Codes of Practice.
- 5.1.4. Lincolnshire County Council has 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, weather conditions, any unusual circumstances of the inspection and 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. 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.
- 5.1.8. The efficiency, accuracy and quality of information and records is crucial both to the effective management of the service.
- 5.1.9. As the Confirm system holds sensitive and/or 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 Lincolnshire County Council's Information Governance Policy.
- 5.1.10. 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.

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## 5.2. NETWORK INVENTORY

- 5.2.1. For the purposes of robust asset management, Lincolnshire County Council uses 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 Lincolnshire County Council has responsibility.
- 5.2.2. The majority of Lincolnshire's highways network assets are recorded in detail and are widely available through the use of the corporate/directorate systems such as "Map Info" Geographical Information System (GIS), Confirm, "MayRise" (street lighting), Structures database, Traffic Signal database and the Traffic Signs database.
- 5.2.3. Definitive maps and statements for Public Rights of Way (PROW) are kept, forming the legal record of the position and status of PROW.

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### 5.3. INFORMATION MANAGEMENT

- 5.3.1. The Authority is currently developing a Data Management Strategy, which will outline its approach towards security, reviews and additional information management which keeps records of asset up-to-date and secure.
- 5.3.2. Records of construction and maintenance treatments are kept informing 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. Lincolnshire County Council adheres in principle to a series of relevant Standards set out by the British Standards Institution. **BS 1192:2007, PAS 1192-2:2013, PAS 1192-3:2014, BS 1192-4:2014, PAS 1192-5:2015 and BS 8536-1:2015.**

## 6. RISK-BASED APPROACH

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### 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 Lincolnshire County Council has 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. Lincolnshire County Council has 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/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.

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## 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  | Lincolnshire County Council Evidence   |
|---|--|
| Alignment with Lincolnshire County Council corporate objectives, legislative requirements, and corporate approach to risk | Lincolnshire County Council continues to adhere to its legal requirements outlined within the various acts shown within Appendix E of this plan, whilst aligning its risk-based approach with its corporate Risk Management Strategy.  |
| An understanding of risk in a highways service  | Lincolnshire County Council has 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 its 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 the Highways service to make informed decisions. |

| Elements  | Lincolnshire County Council Evidence   |
|---|--|
| An understanding of the various assets comprising the highway network;          | Lincolnshire County Council maintains and updates an inventory category through its Asset Management Database system which highlights the function, criticality, sensitivity, characteristics and use of the assets for which it is responsible.   |
| The establishment of hierarchies and levels of service with appropriate funding | Hierarchies have been established and are outlined in <b><u>Section 4 of this Volume</u></b> .   |
| The establishment and subsequent implementation of agreed levels of service     | The levels of service are outlined in our Highways Asset Management Policy. Its subsequent measures, funding regimes and lifecycle planning are outlined in the Highways Asset Management Strategy. Finally, the operational elements carrying out the levels of service and measures are explained within this Highways Infrastructure Asset Management Plan.   |
| Competencies  | Those involved in managing, developing and implementing the risk-based approach must be competent to the satisfaction of Lincolnshire County Council as the Highways Authority. Clear guidance and training is 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). |

| Elements                        | Lincolnshire County Council Evidence  |
|---------------------------------|---|
| Regular evidence-based reviews. | Lincolnshire County Council constantly reviews its 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 the 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 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.
- Network sustainability.

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. Lincolnshire County Council undertakes safety inspections for its various asset groups using a risk-based approach where ever reasonably practicable.



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#### 6.4. DEFECT REPORTING AND REPAIR

- 6.4.1. All defects observed during safety inspections that provide a risk as defined throughout this document to users 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. Category 1 defects which are considered to require urgent attention shall be corrected or made safe at the time of the inspection, if reasonably practicable. In this context, making safe may constitute displaying warning notices, coning off or fencing off to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of inspection, repairs of a permanent or temporary nature shall be carried out as soon as possible. The maximum response times for making safe defects are set out in detail in sections B, C and D of this plan.
- 6.4.3. Category 2 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. Lincolnshire County Council has changed its 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 Appendix B. 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 Lincolnshire County Council has introduced an additional level of defect identification and rectification.
- potholes/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. Lincolnshire County Council now captures this information through; Fix My Street/LCC Website, the Customer Service Centre 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 e.g. obstruction in the highway through the Customer Service Centre.

## 7. FINANCIAL MANAGEMENT, PRIORITIES AND PROGRAMMING

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### 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 Asset Management Strategy.

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### 7.2. PRIORITIES AND PROGRAMMING

- 7.2.1. Lincolnshire County Council's 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, etc.
- 7.2.2. Lincolnshire County Council 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 to the programming section of each volume.

# Highways Infrastructure Asset Management Plan

## VOLUME 1 – HIGHWAYS



## 1. INTRODUCTION – VOLUME 1

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### 1.1. CONTEXT OF VOLUME 1

1.1.1. Volume 1 of the Highway Infrastructure Asset Management Plan covers specific issues and themes regarding highways themselves, and includes the following asset types:

- Carriageways;
- Footways;
- Public rights of way;
- Cycle routes;
- Highway drainage systems;
- Embankments and cuttings;
- Landscaped areas and trees;
- Fences and barriers;
- Traffic signs and bollards; and
- Road markings and studs.

1.1.2 The overarching principles and common themes of maintaining highway infrastructure are covered within Volume 0. Asset specific guidance for structures and lighting are covered in Volume 2 and Volume 3 respectively.

## 2. LEGAL FRAMEWORK

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### 2.1. INTRODUCTION

- 2.1.1. General duties and powers are dealt with in Volume 0 of the plan. This section contains information on duties and powers specifically related to highways.

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### 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 Lincolnshire County Council has 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.

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### 2.3. WINTER SERVICE

- 2.3.1. Details of the Winter Service and its legal requirements undertaken by the Lincolnshire County Council are outlined in a separate document named the Winter Maintenance Plan, approved annually by Members. This document should be read as an annex to the Highways Infrastructure Asset Management Plan.

### 3. ASSET MANAGEMENT INFORMATION

#### 3.1. PRINCIPLES AND CONSIDERATIONS

- 3.1.1. Asset data management is an essential part of the Highways 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. Lincolnshire County Council currently uses the Confirm Asset Management System to cover all of the asset types outlined in Section 1.1.1, with the actual data collected aligning to the Highways 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 Lincolnshire's Carriageways, Footways, Cycle ways, Structures, Street Lights, Drainage Assets, Traffic Signals and any additional street furniture that is the responsibility of Lincolnshire County Council to maintain.
- 3.1.3. The Confirm Asset Management System enables Lincolnshire County Council to undertake multiple activities such as:
- Loading network, inventory and condition data, including data collected by:
    - Visual surveys (CVI and DVI);
    - SCANNER and TRACS Type Surveys (TTS);
    - Footway Network Surveys (FNS);
    - SCRIM; and
    - Deflectograph
  - Data processing
  - Condition reporting Financial reporting to support asset management, including:
    - Inventory reports;
    - Accumulated and annual depreciation of carriageways; and
    - Supporting information for footways, cycletracks and paved verges.
- 3.1.4. 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. Lincolnshire County Council uses these tools of Best Practice to shape its organisation and its methods for delivering the service.

## 4. ASSET CONDITION

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### 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. Lincolnshire County Council undertakes Condition Inspections and Safety/Service Inspections separately. More information on the Safety/Service Inspections can be found in Section 5 of this Volume.

### 4.2. PRINCIPLES AND CONSIDERATIONS

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- 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 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 Lincolnshire County Council to accurately plan the best course of action each time.

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

- 4.2.2. As outlined in Volume 0, Section 4.1.4, the level of customer service is generally more relevant when applied to the whole of the network and 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 CYCLE WAYS

- 4.3.1. The most significant financial investments in highway maintenance will be in repairing, reconditioning and reconstructing carriageways, footways and cycle routes. 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 carriageways/footways/cycleways condition inspections are derived using the principles outlined in Volume 0, 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. Lincolnshire county Council undertakes 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. The Asset Management Team are responsible for producing plans for the Local Highways Teams showing the results of SCANNER, CVI, Deflectograph, and FNS/DVI surveys to assist them to target and prioritise maintenance in their areas.

| 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), | 100% of the MRN, Hierarchy 1 & 2 Network (and other A & B Road) in a single direction each year<br><br>50% of the Hierarchy 3 |

|   |  |   |
|---|--|---|
|   | <p>“Condition of principal roads” and Data Topic 130-02 (formerly NI 169/BVPI 224a)</p> <p>“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.</p>   | <p>and Hierarchy 4</p> <p>Classified Network in a single direction each year. Therefore every road inspection is undertaken bi-annually.</p>                                    |
| CVI (Coarse Visual Inspection)                                  | <p>CVI is normally carried out from a slow moving vehicle, complemented in some cases with machine measured rut depth data. 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 inspectors are accredited.</p> | <p>100% of the MRN, Hierarchy 1 &amp; 2 Network each year</p> <p>50% of the Hierarchy 3 and Hierarchy 4 Classified Network</p> <p>25% of the Unclassified Network each year</p> |
| SCRIM (Sideway-force Coefficient Routine Investigation Machine) | <p>SCRIM results are used to identify lengths of road with poor skidding resistance. SCRIM surveys are carried out in accordance with national good practice.</p>  | <p>33% of the MRN, Hierarchy 1 and 2 Network each year</p>  |
| Deflectograph (Structural Condition Surveys)                    | <p>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</p>   | <p>20% of the MRN, Hierarchy 1 and 2 Network each year</p>  |

|                                  |   |                              |
|----------------------------------|---|------------------------------|
|                                  | requirements.   |                              |
| FNS (Footway Network Surveys)    | The condition of footways is monitored by means of FNS (Footway Network Surveys) and DVI (Detailed Visual Inspection) surveys and an accredited UKPMS pavement management system. | 20% of the Network each year |
| DVI (Detailed Visual Inspection) | The condition of footways is monitored by means of FNS (Footway Network Surveys) and DVI (Detailed Visual Inspection) surveys and an accredited UKPMS pavement management system. | 20% of the Network each year |

- 4.3.5. SCANNER surveys process 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 cycle routes is an important aspect of highway maintenance, and one that contributes significantly to network safety, particularly for cyclists, motorcyclists and equestrians.
- 4.3.9. Lincolnshire County Council undertakes routine skid resistance testing on the Hierarchy MRN, 1 and 2 Network using the SCRIM machine. Surveys are undertaken on a 3 year cycle using the single survey method with benchmark sites. Lincolnshire's Skid Resistance Strategy is published as part of the Asset Management Framework and available on the County Council's website.

- 4.3.10. The Deflectograph is a tool to indicate 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, based on a linear basis. The survey is carried out by a single surveyor walking along the footway, referenced to length within a UKPMS section.
- 4.3.12. FNS surveys record defects in four categories:
- As new
  - Aesthetically impaired
  - Functionally impaired
  - Structurally impaired
- 4.3.13. DVI surveys are carried out in 20 metre lengths and records accurately the position and defect type in that area. This gives a much more detailed survey than the FNS. DVI surveys are carried out when more detailed information is required to support and validate a treatment decision or identify a scheme (supplementing the FNS data).
- 4.3.14. With trees on the footway, Lincolnshire County Council takes into account local and environmental factors.
- 4.3.15. Securing continuous improvement in the safety and serviceability of cycle routes, in particular network integrity, is a necessary component for encouraging cycling as an alternative to the car.
- 4.3.16. Cycleways are included within the FNS asset database to be condition inspected at the same intervals. This only applies for combined footway/cycleway assets, which signifies the majority of the cycleway network.
- 4.3.17. 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.

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#### 4.4. CONDITION OF PUBLIC RIGHTS OF WAY

- 4.4.1. The condition of Public Rights of Way (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 the Lincolnshire 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 ROWIP has been implemented under four themes, each with a strategic aim and supporting the wider social objectives of the County Council including the aims of the LTP:
- 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. Lincolnshire County Council Countryside currently utilises the Countryside Access Management System through which it maintains an overview of its assets. It further maintains and updates the Definitive Map and Statement to outline its legal record of public rights of way.
- 4.4.5. Countryside 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 & Safety, using the following methods:

|                   |  |
|-------------------|--|
| <b>Priority 1</b> | Routes actively promoted by Lincolnshire County Council (e.g. Viking Way, Bridle Trails, Recreational Walk Routes)   |
| <b>Priority 2</b> | Routes that are known to be well used, predominantly close to settlements <u>or</u> routes promoted by other bodies and specifically endorsed by Lincolnshire County Council |
| <b>Priority 3</b> | All other available routes.  |
| <b>Priority 4</b> | 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<br><br>(Ploughing & Cropping) | Grass Cutting & Vegetation Clearance (Subject to cyclical programme) | Path Furniture Repair and Minor Obstructions | New or Replacement Bridges                          | Essential Surfacing Works                              |
|---|---|--|--|---|--|
| 1   | 3 Months  | 2 Months   | 3 Months                                     | Subject to size, location and resource availability | Works Subject to Finance and Availability of Workforce |
| 2   | 4 Months  | 2 Months   | 6 Months                                     |   |  |
| 3   | Works Subject to Finance and Availability of Workforce        |  |  |   |  |
| 4   | 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 the County Council 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 Lincolnshire County Council's obligations concerning protecting biodiversity, stemming from

the Natural Environment & Rural Communities Act 2006 and various other wildlife legislation, it may be prudent to defer works until a more appropriate time providing that the route is not wholly obstructed.

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#### 4.5. CONDITION OF HIGHWAY DRAINAGE SYSTEMS

4.5.1. The Highway Authority are responsible for the maintenance of highway drains i.e. drains which only carry water discharged from footways, access crossings, highway verges and carriageways. Drains which carry other water including foul water may be sewers or combined drains and are the responsibility of the water authority (Anglian Water or Severn Trent Water) or the local District Council. Roadside gullies are maintained by Lincolnshire County Council and are usually cleaned once a year on a targeted approach.

4.5.2. Highway drainage condition standards fall into these main categories:

- Grips and ditches - can be obstructed by growth of vegetation or damaged by traffic and animals. Grips and Highway Authority ditches will be cleared of vegetation and dug out when required. Grip clearing will be commenced after the last grass cut and the programme completed if possible before the worse of the winter weather.
- Gullies, Kerb offlets and Catchpits; will be cleared once per year on a cyclic basis. In most cases the responsibility for maintenance of roadside ditches will rest with the adjoining landowner.
- Piped drainage – includes a wide variety of conduits and filter drains, which may be susceptible to siltation or blockage. Piped drainage, soakaways and associated systems will be checked and flushed if necessary during service inspections and cleared when required.

4.5.3. More information on culverts can be found in Volume 2 of this plan.

4.5.4. Material arising from all road drainage emptying and cleansing operations has potential implications for pollution and shall be disposed of correctly in accordance with Environment Agency, or equivalent authority, requirements.

- 4.5.5. 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.
- 4.5.6. 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/or 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.
- 4.5.7. Ironware comprising covers, gratings, frames and boxes set in carriageways, footways and cycle routes 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 Utilities.
- 4.5.8. Although responsibility for defective ironwork may lie with Utilities, defects identified during inspection or from users will therefore be formally notified to the Utility with a follow up procedure to ensure that dangerous defects are remedied within the prescribed timescale.
- 4.5.9. The standards outlined below can be varied where necessary to deal with problem locations where more frequent treatment may be required.

| <b>Drainage</b> | <b>Type of Cleanse</b> |
|-----------------|------------------------|
| Gullies         | 1 clean per annum      |
| Catch-pits      | 1 clean per annum      |
| Grips           | When Required          |
| Offlets         | 1 clean per annum      |



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#### 4.6. CONDITION OF EMBANKMENTS AND CUTTINGS

- 4.6.1. Slips and rock-falls happen rarely. However the Council have records of suspect locations and have established an inspection and maintenance regime based on a local risk assessments. The Council's scheme is based on the Highways Agency's inspection regime which inspects cuttings and embankments over 5 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.
- 4.6.2. 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. A record of locations prone to rock-falls and slips is kept by the Council.
  - 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.
- 4.6.3. 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.
- 4.6.4. 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. The Council has records of relevant locations and has established an inspection and maintenance regime based on a local risk assessment.

#### 4.7. CONDITION OF LANDSCAPE AREAS AND TREES

- 4.7.1. Lincolnshire County Council undertakes regular safety surveys of its highway network to assess the risks posed by trees. This section defines the terms of reference for the safety survey.
- 4.7.2. All established trees within the highway are visually inspected as part of condition surveys to identify obvious potential hazards. Surface damage to carriageways, footways and cycle ways, associated with root growth will be recorded as part of Safety and Service Inspections for those elements. More information on those inspections can be found in Section 5 of this Volume.
- 4.7.3. Trees on or adjacent to the highway are surveyed using tree management software, trees are only recorded if they meet the following criteria, i.e. they have a stem diameter greater than 300mm, are planted within the highway limits or are within 25m of the highway (private trees) if appropriate the tree is assessed with a system called Quantified Tree Risk Assessment (QTRA). QTRA is a method of quantifying risk associated with tree failure and requires 3 variables in order to make the assessment.
- Size of part likely to fail.
  - Likelihood of failure.
  - What will be hit (Target).

Lincolnshire County Council Officers will QTRA score any privately owned within falling distance of the highway that has an identified defect in the trees condition. An NVQ level 5+ inspector will carry out the assessment.

- 4.7.4. The Health and Safety Executive (HSE) states that risk ratings above 1/10,000 are 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).
- 4.7.5. Lincolnshire County Council follows the same process for the whole network. However, where the risk score from individual trees is above 1:10,000 the emphasis will be on the collection of highway trees as assets. The potential for private trees to fail onto these routes is the same, however the risk ratings and subsequently the target is expected to be reduced due to infrequent use of these routes (i.e. reduced traffic flows than H1a, H1 & H2 routes).

- 4.7.6. Highway trees identified for safety work through the survey will be dealt with through the term contract. For all other LCC trees, a safety report will be sent to the owning department for their attention and action. Private Trees with risk ratings of 1:1 – 1:10,000 will be enforced through letters and ultimately S. 154 notices where appropriate.
- 4.7.7. The obstruction of street lighting and traffic signs can be a major safety risk to users. A risk based inspection process has been put in place, which is detailed in Volume 3 of this plan. Trees and other foliage shall be trimmed back to allow the lighting to function and the signs to be legible, while maintaining the shape of the tree wherever possible. During routine night patrols any obstructions should be recorded. More details can be found in Volume 3 of this plan.
- 4.7.8. 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 the highway trees with TPOs and in conservation areas.
- 4.7.9. 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.
- 4.7.10. In urban areas trees have a significant impact on the local environment, but can cause damage to highways and property if not properly managed. The County Council Arboricultural team co-ordinate a proactive management programme including regular inspections.
- 4.7.11. 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. 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 and other relevant legislation. 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.
- 4.7.12. Any proposed tree planting shall conform to the maxim 'The right tree in the right place' and consider proximity to existing or planned street lighting, to

minimise the risk of shrouding the street lights, or casting unnecessary shadows on the highway.

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#### 4.8. CONDITION OF VERGES

##### **Grass Cutting**

- 4.8.1. 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.
- 4.8.2. 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 65 Roadside Nature Reserves, some of which are Sites of Specific Scientific Interests where the flora and fauna are of 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.
- 4.8.3. 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 unkerbed roads, siding will be carried out in advance of footway surface treatment, where necessary.
- 4.8.4. This plan provides for flexibility in applying judgement 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**

- 4.8.5. The growth of weeds in footways and cycle routes, 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.

- 4.8.6. The Council carries out total weed control operations on areas of paving and hard standings, kerb and channels, back of footway, base of walls and around street furniture. Weed spraying covers a total of 4600 km of kerbs, and is undertaken bi-annually.
- 4.8.7. 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.
- 4.8.8. 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.
- 4.8.9. Lincolnshire County Council's policy is to carry out selective weed control operations on rural 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 and/or feed/forage production and Lincolnshire County Council must take action to control the spread of ragwort.

| Verges         | Treatment   |
|----------------|---|
| Grass Cutting  | Safety (Rural) Hierarchy 1 – 3 cuts<br>Safety (Rural) Hierarchy 2 & 3 – 3 cuts<br>Safety Hierarchy 4 & 5 – 3 cuts |
| Weed Treatment | 2 treatments a year   |

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#### 4.9. CONDITION OF NON-ILLUMINATED TRAFFIC SIGNS AND BOLLARDS

- 4.9.1. 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.
- 4.9.2. Lincolnshire County Council carries out both general route reviews and specified whole route reviews, reviewing all sign assets on a particular route/area with regard to legality, condition and ownership. Every five years the signing regime for Hierarchy 1, 2 and selected 3 roads will be reviewed to ensure integrity and to remove unnecessary clutter from the network.
- 4.9.3. It is Lincolnshire County Council's policy that smaller Signs would not be replaced unless they were
- Warning (eg Give way, )
  - Prohibition ( eg No entry )
  - Regulatory ( eg Speed limit /TRO's warning plates)
- 4.9.4. Lincolnshire County Council is responsible for ensuring that any safety issues with regards to any signs are resolved in line with the risk-based response times to reactive maintenance.
- 4.9.5. Large Advances Direction Signs (ADS) and other community signs will continue to be replaced if needed depending on work volume and resource capacity.
- 4.9.6. 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 4 times a year for bollards. All others as required.
- 4.9.7. 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 replacement, and shall also be considered during any network integrity inspections.
- 4.9.8. Heritage signs and milestones will be refurbished or will be replaced with same or similar whenever possible.

| Condition Inspection                                 | Frequency   |
|--|---|
| General Condition                                    | Part of the General Highways Inspection   |
| Route Reviews  | Every 5 years on MRN, H1, H2 and selected H3 Roads  |
| Cleaning   | Once a year for strategic road network (MRN-H1-H2 and 4 times a year for bollards. All others as required. Note: Any faults will be reported including any within 20 m on each side of the road |
| Replacement and repair of damaged signs and bollards | Respond according to the degree of danger. In extreme cases this would be within 2 hours.   |

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#### 4.10. CONDITION OF ROAD MARKINGS AND STUDS

4.10.1. 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.

4.10.2. 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.

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

4.10.4. All mandatory road markings existing before resurfacing, patching or surface dressing shall be replaced as soon as is reasonably practical:

- Stop and Give Way markings shall be replaced within 7 days
- Other Mandatory lines within 14 days

- All other markings and road studs within 28 days of completion of works
- 4.10.5. 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.
- 4.10.6. 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 (e.g. 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.
- 4.10.7. A programme of works regarding markings and road studs will be developed, based on needs and priorities. This demonstrates a move towards more programmed and routine maintenance of road studs and markings.

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#### 4.11. CONDITION OF TRAFFIC SIGNALS, PEDESTRIAN AND CYCLE CROSSINGS

- 4.11.1. Annual inspections 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
  - Earth testing
- 4.11.2. 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 TD 24/86.
- 4.11.3. 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.
- 4.11.4. The following frequencies will be used:

| Condition Inspection      | Method & Frequency   |
|---------------------------|--|
| Scouting for illumination | Covered by Urban Traffic Control and Remote Monitoring Systems |



|                                   |   |
|-----------------------------------|---|
| 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                                 |

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#### 4.12. USER AND COMMUNITY RESPONSE

4.12.1. 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. Lincolnshire County Council engages with the NHT Public Satisfaction Survey and has robust options for dealing with service requests and complaints involving a dedicated Customer Service Centre and FixMyStreet for online reporting.

4.12.2. To provide clarity, the Council has adopted dimensional definitions for potholes based on best practice as part of its maintenance policy. LCC's 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 0, 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, Lincolnshire County Council has put in place inspections to assess the highway network. The collection of inspection results is managed through the use of Confirm Enterprise Infrastructure Management System using portable tablet computers and handheld devices with global positioning system (GPS).
- 5.1.3. Lincolnshire County Council undertakes 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.
- 5.2.2. LCC has 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 0, 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 comprise of Safety Inspections and Service Inspections. They do not cover the following:

- Condition inspections such as specialist engineering inspections (including Coarse Visual Inspection and Detailed Visual Inspection), machine inspections (e.g. 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 & section 36 inspections)
- Street lighting (including illuminated signs) inspections
- Ad-hoc inspections in response to specific problems or complaints

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

5.2.6. All category 2 defects should be identified as much as reasonably possible during the inspection to provide a clear understanding of our assets.

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

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### 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. Where there are (i) carriageways with no footway, or (ii) footways with no carriageway (typically called 'link' footways and usually found in urban areas), there is only one hierarchy classification. 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 0, Section 4.

## 5.4. INSPECTION FREQUENCIES

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

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

5.4.2. For reasons of route efficiency hierarchy MRN, 1 and 2 carriageway inspections will be Route Based i.e. the inspections will extend across the whole of an Local Highways Managers area and as such the inspecting officer may not be responsible for the routine maintenance requirement of the road (s)he is inspecting.

- 5.4.3. All other inspections are Area Based i.e. they are a selection of roadway 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.

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## 5.5. INSPECTION SCHEDULES

- 5.5.1. To facilitate the efficient implementation of the inspection regime each roadway asset will be assigned to one of seven inspection schedules. The schedules are based upon the lead hierarchy of each asset which is defined as the higher of the LCC carriageway or LCC footway hierarchy with both carriageway and footway being inspected at the same time. In Line with the risk-based approach which outlines 'Where carriageway and footway hierarchies intersect, for example at pelican or zebra crossings, bollards, or other defined crossing points at junctions, the higher inspection frequency takes precedence in determining of inspection frequency, defect definition and responses. This principle also applies to intersections between carriageways and cycle routes and between cycle routes and footways.'
- 5.5.2. The exceptions to this rule are:
  - (Ex.1) Hierarchy MRN, 1 and 2 carriageways in rural areas, where the adjacent footway inspection is carried out separately from the carriageway inspection (as referenced to in the schedules below).
  - (Ex.2) Hierarchy MRN, 1 and 2 carriageways in urban areas on which the adjacent footways have been identified as being impractical to inspect from a vehicle due to obstruction by way of remoteness, difference in level or other physical obstruction along a significant length (as referenced to in the schedules below).
- 5.5.3. For each of the above categories each footway will be inspected at the correct frequency for its designated hierarchy.
- 5.5.4. Where sections are identified as being impractical to inspect from a vehicle the inspections will be walked, irrespective of hierarchy.

5.5.5. Explanation of inspection schedules:

Numeric = frequency of inspection (e.g. 12 per annum)

A = Area based

D = Driven

R = Route based

W = Walked

5.5.6. The inspection schedules are tabulated below:

| Schedule | Roadway Asset                         | Hierarchy | Inspection Frequency per annum | Comments  |
|----------|---------------------------------------|-----------|--------------------------------|---|
| 12WA     | Footway and Carriageway               | MRN/1     | 12                             | Includes carriageway adjacent to footway  |
| 12DR     | Urban & rural carriageway and footway | MRN/1     | 12                             | Includes adjacent footways except Ex1 and Ex2   |
| 4WA      | Footway and Carriageway               | 2         | 4                              | Includes adjacent carriageways except Ex1 and Ex2   |
| 4DR      | Urban & rural carriageway and footway | 2         | 4                              | Includes adjacent footways except Ex1& Ex2 above and Schedules 12WA & 4WA   |
| 4DA      | Carriageway and footway               | 3         | 4                              | Excludes footways identified in Schedules 12WA, 4WA, 12DR and 4DR. Includes hierarchy 4 slabbed/modular footways. |
| 1WA      | Footway                               | 4         | 1                              | All footways not included in Schedules 12WA, 4WA, 4DR, 4DA and 12DR   |
| 1DA      | Carriageway and footway               | 4, 5, 6   | 1                              | Excludes footways identified in Schedules 12WA, 4WA and 4DA.  |
| 1/3DA    | Carriageway                           | 7         | Every 3 years                  | Driven if possible, else walked   |
| 1/5WA    | Carriageway                           | 8         | Every 5 years                  |   |

- 5.5.7. If a single section of road is bordered by footway assets which have different hierarchies the highest hierarchy is deemed to apply to all the footways along the section for the purposes of the inspection procedure.
- 5.5.8. 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 1 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.
- 5.5.9. Link footways, alleyways and very narrow roads are incorporated into the appropriate schedule.

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#### 5.6. SERVICE INSPECTIONS - GENERAL

- 5.6.1. Lincolnshire County Council undertakes Service Inspections in conjunction with the Safety inspections.
- 5.6.2. 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 Asset Management Strategy to determine programmes of work.

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#### 5.7. SERVICE INSPECTIONS FOR CARRIAGEWAYS, FOOTWAYS AND CYCLE ROUTES

- 5.7.1. Service inspections for carriageways, footways and cycle routes 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.
- 5.7.2. 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 & Patching Treatment, Surface Treatment and Edge Treatment.

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## 5.8. SAFETY AND SERVICE INSPECTIONS OF PROW

- 5.8.1. The Countryside team follows an area-based approach towards its inspection regime.
- 5.8.2. The regime follows Countryside 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 5 year period each parish and paths will have been inspected once.
- 5.8.3. As per Volume 0, Section 4 of this plan, where certain PROW are considered part of the footway hierarchy, safety inspections are carried out accordingly.
- 5.8.4. The Inspections will highlight issues, defects and obstructions on the Public Rights of Way whilst providing information on the condition of any known PROW structures.

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## 5.9. SAFETY AND SERVICE INSPECTIONS OF LANDSCAPED AREAS AND TREES

- 5.9.1. Lincolnshire County Council is responsible for ensuring that trees outside the highway boundary, but within falling distance, are safe. Section 154 of the Highways Act 1980 empowers Lincolnshire County Council to deal, by notice, with hedges, trees and shrubs growing on adjacent land which overhang the highway, and to recover costs if appropriate.
- 5.9.2. Safety and Service inspections undertaken by our Local Highways Team incorporate highway trees, including those outside but within falling distance of the highway. Gale damage, broken or overhanging limbs and unstable/leaning trunks which endanger the highway are further included within the Safety inspection, if the inspector judges them to pose a danger to highway users.
- 5.9.3. When the tree is privately owned and safety considerations permit, the owner/occupier shall be informed and given notice to take action within 28 days. If safety considerations do not permit, then appropriate action should be



taken to make safe. Follow-up action will be necessary immediately after the 28 days have expired if the owner/occupier does not respond appropriately.

- 5.9.4. Lincolnshire County Council includes some basic arboricultural guidance in training for inspectors but 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 safety inspections for all trees is undertaken by the Council's arboricultural officers. See Condition Surveys Section 4, for more information.
- 5.9.5. Highway trees contribute to amenity and nature conservation and in urban areas can enhance the space between buildings, reinforcing the area's character and appeal. Close co-operation between arboriculturalists, highway engineers, landscape architects and urban designers is essential to preserve and enhance the range and quality of street trees, ensuring 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.
- 5.9.6. Street trees and planting are not appropriate in every instance. Trees and planting should always form part of the overall urban context, and not be added or preserved without question. Trees may be planted where trees have not been planted previously particularly in urban areas that have changed use (e.g. warehousing to residential) or in areas where historically they were considered unworthy of tree planting.

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## 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 half or more 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. The defects in the following small signs and bollards shall be considered during the Safety and Service inspections as potential replacement options:

- Warning (eg Give way , Chevrons )
- Prohibition ( eg No entry )
- Regulatory ( eg Speed limit /TRO's warning plates)

5.10.4. Any Non-illuminated “stop” signs, “give way” signs, “no entry” signs, “one way” directional signs identified within the inspection should therefore 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 Signs (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 cycle routes, 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.

5.10.8. The condition of non-illuminated road signs shall be inspected in daylight, and also at night 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.

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#### 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 paint markings and for 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 4.4.7. of Section 4

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.

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#### 5.12. SERVICE AND SAFETY INSPECTION OF TRAFFIC SIGNALS & 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 remote monitoring system which records or reports lamp failures.

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 2 hours and repaired within 24 hours.
- Traffic signal controllers damaged beyond repair are replaced within 72 hours where reasonably practicable
- Failed traffic signal lamps are repaired within 24 hours.
- Less urgent faults are repaired within 48 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 reasonable practicable.

### 5.13. REGULATORY FUNCTIONS

5.13.1. A significant element of the 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, for example illegal signs or encroachment, may have the potential to contribute to accidents; and the details of how the occurrence was dealt with (or not dealt with) by Lincolnshire County Council may be a material consideration in legal proceedings; and
- 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 Management Plan.

## 6. PROGRAMMING AND PRIORITIES

### 6.1. INTRODUCTION

- 6.1.1. The general principles to be applied to programming and priorities are outlined in Volume 0, 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. Lincolnshire County Council has 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 Management Plan; and
- Winter Service – providing locally defined levels of service of salting and clearance of ice and snow, outlined in our Winter Maintenance 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 also 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. Lincolnshire County Council 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.

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#### 6.4. PRIORITIES FOR PLANNED & 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. Lincolnshire County Council therefore employs 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 and DVI inspections. Combined with results of other surveys such as deflectograph, SCRIM and local Safety & Service inspections enable informed decisions to be made in respect of planned maintenance programmes and treatments.
- 6.4.3. As mentioned in Volume 0, 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 (i.e. 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 Lincolnshire's Asset Management Strategy.

6.4.4. Programmed Maintenance within Lincolnshire County Council 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 Cleaning

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

- Patching and Resurfacing -
- Surface Treatments
- Minor Works and Traffic
- MMT and Cyclic

6.4.6. For scheme identification and prioritisation on the Classified Road Network (MRN, H1, H2, H3 and H4) a Lincolnshire Condition Indicator (LCI) has been developed which utilises a combined CVI and SCANNER indicator to give an overview of the surface condition of the network. A large number of potential schemes have been identified based on a visual assessment of the condition information. All available condition data including SCANNER, CVI, Residual Life from Deflectograph surveys and SCRIM that is held in Confirm is queried using the existing mapping tools to prioritise schemes and identify suitable treatments based upon an established set of "Rules and Parameters"

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

- The information obtained from condition surveys is processed by the Lincolnshire Condition Indicator system to establish an indicative programme with process outlined in 6.4.5. ;

- As part of the calculations for prioritisation, defect reports from the public are taken into consideration, the more unique defects reported increase the weighting added to the final scoring assigned to the site, this integration of condition data and customer information allow us to further target our resource to the need of the network and the user.
- The indicative 3 year programme for individual hierarchies should then be developed into individual schemes that meet the levels of service in the Highways 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 the County Councils 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 principal road network (MRN, H1 & H2), which is updated annually on the basis of latest survey data.

6.4.10. The LCI generates a three-year indicative programme for the surface maintenance schemes H3 and H4 carriageway network, with an annual works programme for the schemes of work outlined, approved and put on the Lincolnshire County Council website <https://www.lincolnshire.gov.uk/faults-maintenance/highway-works-programmes>

6.4.11. For the Unclassified Network (H5, H6, H7 and H8), schemes are determined using a combination of CVI data maps and the priorities of Local Highway Managers. They are provided with detailed maps showing the results of CVI and DVI surveys. These combined with annual local Safety & 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 3 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 none routine elements of the network such as signs, lighting columns etc. 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, Lincolnshire County Council has developed priorities and programmes for the structure, surface and edge of carriageways, footways and cycle routes, 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.

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## 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 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. Lincolnshire County Council undertakes 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 2 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.

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## 6.6. VALUE ENGINEERING & TREATMENT BEST-PRACTICE

- 6.6.1. Lincolnshire County Council adheres 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. Lincolnshire County Council utilises the Lincolnshire County Council's Maintenance Design Manual, outlined by expert Lincolnshire designers based on recognised best practice, as its 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, Lincolnshire County Council adheres to Transport Research Laboratory's Road Note 39 which sets out Best-Practice when considering surface dressing programmes.

# Highways Infrastructure Asset Management Plan

## VOLUME 2 – STRUCTURES



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## 1.1. INTRODUCTION

- 1.1.1. Volume 2 of the Highways Infrastructure Asset Management Plan deals with the highway structures associated with the adopted road network which meets the dimensional criteria, in line with Part C of the Well-Managed Highways Infrastructure Code of Practice. In addition, the general principles apply to structures associated with all other highways that are used by the public, e.g. segregated footpaths and cycle routes, and the Public Right of Way network.
- 1.1.2. Highway Structures include Culverts, Bridges, Footbridges, Retaining Walls, Subways and Overhead Gantries. There are 3961 structures in Lincolnshire that are the responsibility of Lincolnshire County Council including 1511 bridges (over 1.5m span), 2183 culverts, 13 Subways, 1131 Highway footbridges and 139 recorded retaining walls. In addition there are a further 1780 privately owned structures, carrying County roads. The main owners of these are Network Rail, Rail Property, the Environment Agency and various Internal Drainage Boards.
- 1.1.3. 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.
- 1.1.4. The overarching principles and common themes of maintaining highway infrastructure are covered within Volume 0. Asset specific guidance for highways and lighting are covered in Volume 1 and Volume 3 respectively.
- 1.1.5. 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/agencies.

## 2. LEGAL FRAMEWORK

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### 2.1. STATUTORY OBLIGATIONS

- 2.1.1. General duties and powers are dealt with in Volume 0 of this HIAMP. All relevant legislation on Highways Structures is mentioned in Appendix E of the Plan.

## 3. ASSET MANAGEMENT INFORMATION

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### 3.1. INTRODUCTION

- 3.1.1. Asset data management and its systems are dealt with by the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B and Part C.
- 3.1.2. Lincolnshire County Council Highways operates 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; and
  - 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 data held by Lincolnshire County Council 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 & 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 focussed 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 Volume 2.
- 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. Lincolnshire County Council, as a Highways Authority, is responsible for the construction, maintenance and repair of highway structures owned by the authority. This section will focus on the design and construction element of Lincolnshire County Council's responsibilities.
- 4.1.2. All design specifics for small-scale structures have been defined in Lincolnshire County Council's Maintenance Design Manual (MDM), Section 12.
- 4.1.3. All maintenance work should preferably be designed to current standards, although there may be situations where lesser standards are acceptable, e.g. 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 Highways England 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. Lincolnshire County Council's own MDM takes note of these standards and integrates them into their 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 Lincolnshire County Council 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.

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## 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 Lincolnshire County Council maintains 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. This document is currently in development and will be published October 2018.

- 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 Volume 2.

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#### 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. Lincolnshire County Council 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 incurred by the County Council
- 4.3.3. Lincolnshire County Council is not responsible for any Trunk Road structure. Trunk Road structures are managed by Highways England 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 0 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; and
3. compile, verify and maintain inventory data

5.1.3. The Inspection Manual for Highway Structures (Volumes 1 and 2) was commissioned by Highways England and published in May 2007 and is utilised for Lincolnshire County Council's 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, e.g. 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; and
- 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; and
- 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       | 2 yrs                      |
| Culverts                | General         | Corrugated Steel or Concrete Pipes | 6 yrs                      |
| Bridges & Miscellaneous | General         | All                                | 2 yrs                      |
| Bridges & Miscellaneous | Principal       | Span >5m                           | 6 yrs                      |
| Bridges & Miscellaneous | Principal       | Span < 5m                          | Subject to risk assessment |
| Retaining Wall          | General         | Ret Ht >3m                         | 2 yrs                      |
| Retaining Wall          | General         | Ret Ht >1.37m                      | 6 yrs                      |

Notes:-

*(1) Refer to Appendix D for Type of Structure definitions*

*(2) Structures on the Public Rights of Way (PROW) network will be subject to an independent inspection and recording regime.*

5.2.2. Lincolnshire County Council carries out routine surveillance as part of the 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. Lincolnshire County Council carries 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. Lincolnshire County Council carries 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 5m or greater carrying Public Right of Ways. The 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 6 years, unless greater in height than 3m, in which case they will be inspected every 2 years. No Principal Inspections are carried out on retaining walls.
- 5.2.7. The frequency of General Inspections will be every 2 years. For Public Rights of Way footbridges over 5m span General Inspection interval is 6 years, and Public Rights of Way bridges between 5 and 10m span receive a Principal Inspection at 6 yearly intervals (instead of General Inspection).
- 5.2.8. Countryside Staff will have sole responsibility for carrying out inspections to structures with spans less than 5m carrying Public Rights of Way. The frequency of inspection of structures on Public Rights of Ways is every 2 years on sign posted paths and 3 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 5m will receive a risk assessment to determine the requirement for a Principal Inspection. In many cases a General Inspection every 2 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 2 years, and where the structure qualifies for a Principal Inspection it will take place every 6 years. This approach presents a regularity of inspection interval and record keeping which reduces risk to the authority.
- 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 (i.e. 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 < 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 6 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. The 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. Lincolnshire County Council continues 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

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

1. Handover of a new structure:

- o 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:

- o 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.

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### 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 Lincolnshire County Council is 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 cycle routes. These inspections are undertaken as part of the Local Highways Teams duties and more information on their inspection frequencies can be found in Volume 1, Section 4 and 5 of this Plan.

5.3.3. Vehicle restraint systems are inspected in accordance with Lincolnshire County Council's 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.

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#### 5.4. CONDITION OF FENCES AND BARRIERS

5.4.1. It is required that all safety fence 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:

|                         |   |
|-------------------------|---|
| 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.                         |



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#### 5.4. COMPETENCE AND TRAINING

- 5.4.4. 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.
- 5.4.5. 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.
- 5.4.6. 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 Chartered Engineer status.

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#### 5.5. 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 Highways England 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 BD21 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 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. Lincolnshire County Council 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

### 6.1.1. INTRODUCTION

- 6.1.1. Programming and priorities are dealt with in the UKRLG Highway Infrastructure Asset Management Guidance (HIAMG), Part B. The general principles to be applied to programming and priorities are outlined in [Volume 0](#) of this Code, with this section covering guidance relating to structures.
- 6.1.2. The maintenance planning and management process enables the Structures Manager to deliver Lincolnshire County Council's 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.

### 6.2.1. 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

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### 6.3. ROUTINE MAINTENANCE

- 6.3.1. Lincolnshire County Council has 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 2 maintenance gangs for small Structures and safety fence items generated by bridge inspections and third party reports.

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### 6.4. REACTIVE MAINTENANCE

- 6.4.1. Lincolnshire County Council will reactively respond to any defects on its network, in accordance with its 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, Lincolnshire County Council will remove it as soon as practicable. None offensive graffiti may be removed during other planned maintenance works.
- 6.4.3. Lincolnshire County Council is suitably prepared for urgent safety and stability concerns and emergencies and deals 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. Lincolnshire County Council will further have a reactive response to its road restraint systems in terms of safety barriers. If the damage is safety critical Lincolnshire County Council will aim to make safe as soon as possible and repair within 7 days if reasonably practicable.

## 7. PROGRAMMED MAJOR MAINTENANCE

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### 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 is 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 condition and performance data should be reviewed periodically by the Structures Manager 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.

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## 7.2. LIFECYCLE PLANS

- 7.2.1. Lifecycle plans shall be used to identify needs on specific structures and elements. The cyclic/intervention rules established in the lifecycle plans are compared against the current condition and performance of a structure/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 Asset Management Strategy

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## 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, e.g. re-active maintenance, 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 1 year programme of work. This provides details of the schemes to be carried out in the 1 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 5 year rolling indicative programme of work, which outlines all identified planned works over the upcoming 5 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/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, i.e. which year; and
- estimated cost.

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## 7.4. VALUE MANAGEMENT

7.4.1. Lincolnshire County Council prioritises 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 1 year Forward Work Plan

7.4.3. Factors considered in scheme selection include:

- position on the carriageway, footway, cycle route or PROW hierarchy;
- public safety implications;
- Financial implications of the work;
- implications of not acting, or delaying action;
- type of asset, e.g. bridge, tunnel, retaining wall, earth structure, etc;
- obstacle crossed, bridge span, retained earth height;
- critical asset, historic structure, permanent weight, height, width or swept path restriction;
- construction material, e.g. concrete or steel bridge, arch, slab or beam/girder bridge, concrete or stone walls, etc; and
- 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. Lincolnshire County Council employs 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 will be reviewed and adjusted by the Authority if required.
- 7.5.6. Lincolnshire County Council further undertakes multiple feasibility studies throughout its 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.

# Highways Infrastructure Asset Management Plan

## VOLUME 3 – STREET LIGHTING





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## 1.1. INTRODUCTION

- 1.1.2. Volume 3 of the Highways Infrastructure Asset Management deals with specific issues and themes regarding Street Lighting within Lincolnshire, in line with Part D of the Well-Managed Highways Infrastructure Code of Practice.
- 1.1.3. Lincolnshire County Council, as a highway authority, is empowered to light the highways but they 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.
- 1.1.4. Street Lighting cover a number of different asset types, these can include:
- lighting columns;
  - lighting units attached to walls/wooden poles;
  - heritage columns;
  - illuminated bollards;
  - illuminated traffic signs;
  - columns and foundations;
  - brackets;
  - luminaires;
  - control equipment, cables; and
  - control gear, switching, internal wiring cabling (within ownership).

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## 2.1. LEGAL FRAMEWORK

- 2.1.1. All general duties, powers and legislation specifically related to Street Lighting are dealt with in [Volume 0](#) and [Appendix E](#) of this HIAMP.

## 3. ASSET MANAGEMENT INFORMATION

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### 3.1. CENTRAL MANAGEMENT SYSTEM (CMS)

- 3.1.1. Subject to funding being available, it is the policy of Lincolnshire County Council to implement a CMS system for the control of Street Lighting in Lincolnshire.
- 3.1.2. CMS shall be used to control street lights and provide an adaptable and flexible street lighting network.

3.1.3.CMS may be used to manage lights according to the hierarchy. Upon request from the appropriate authority, lights may be switched on or light output increased at sites where there is:

- Congestion
- Road works
- Incidents such as road traffic collisions, flooding etc.
- Localised reports of high crime or vandalism

3.1.4.Subject to them investing in the installation of communication nodes on their street lights, and paying for any other hardware or software expansions required, lighting authorities within Lincolnshire and neighbouring areas may make use of the CMS to manage their lights.

3.1.5.Participating authorities shall meet the full cost of providing CMS for their lights.

## 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 17th edition 2011: The Requirements for Electrical Installations.

4.1.4.LED and HID white light lamps shall be the preferred light source throughout the county.

4.1.5.Street Lighting burning hours will normally\* be:

Part Night Lighting: Dusk to 24:00 then

06:00 to Dawn

Dusk and Dawn switching levels as All Night Lighting

Dimmed Lighting: Depending on road geometry, expected use, traffic volumes and speed:

21:00 to 06:00 dimmed to 75% OR

24:00 to 06:00 dimmed to 75% OR

20:00 to 24:00 dimmed to 75% then to 06:00 dimmed to 50%

Dusk and Dawn switching levels as All Night Lighting

All Night Lighting: Dusk to Dawn 35 LUX on and 18 LUX off

Pedestrian Subway lighting twenty-four hour operation

\*The UK adjusts clocks between British Summertime and Greenwich Mean Time in the spring and autumn. The lights have individual sensors that monitor the number of daylight hours, which is how they set their internal clock. This is then used to adjust for the change to British Summertime or Greenwich Mean Time. That means the sensors on the part-night lights enter a period of adjustment during spring and autumn, where the lights may start to turn off, or dim, slightly earlier or later than normal. Unfortunately, this is unavoidable but should have little or no impact on safety.

4.1.6. To minimise light pollution, lanterns on principal routes, major traffic routes and towns centre areas shall have a cut off distribution to minimise upward light glow with little or no light emitted above the horizontal, conforming to a minimum G4 luminous intensity rating.

4.1.7. Low energy electronic control gear and photocells shall be used.

4.1.8. In dimmed areas the levels of light at the bright and dimmed phases shall be compatible with an appropriate standard derived from BS 5489 – 1: 2013 and BS EN 13201-2: 2013

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## 4.2. STREET LIGHTING ON EXISTING ROADS

4.2.1. On existing adopted roads, Lincolnshire County Council will, as far as practicable, ensure its lighting forms a sustainable network by managing energy consumption to a minimum by:

A. Working through the following hierarchy for existing street lights wherever practicable, including when lighting comes to the end of its useful life:

1. Complete removal of lights (subject to a lighting assessment and local engagement) where this is the most financially sustainable solution considering removal costs.
  2. Turning lights off (subject to a lighting assessment)
  3. Part night lighting as described in section 4.1.5.
  4. Dimming lights as described in section 4.1.5.
  5. As a last resort, leaving lights fully lit during normal lighting hours.
- B. Only supporting the provision of additional street lights on the existing highway where they are part night lit or dimmed and either:
1. they are financed by other local councils in Lincolnshire, in which case Lincolnshire County Council will adopt and maintain them without a commuted sum or;
  2. it is in the interest of improving road safety (see 4.3 below) and finance is available from road safety budgets or;
  3. they are paid for as part of a S278 scheme required for a developer to comply with a planning condition and are accompanied by a commuted sum or;
  4. they are requested and paid for by major trip or abnormal load generators and are accompanied by a commuted sum.
- C. Considering removal or replacement of existing street lighting, taking account of the hierarchy in A above:
1. when it comes to the end of its useful life and it is financially sustainable in the specific location, considering replacement or removal costs or;
  2. when paid for as part of a S278 scheme required for a developer to comply with a planning condition or;
  3. it is requested and paid for by major trip or abnormal load generators
- 4.2.2. Lincolnshire County Council funding for street lighting shall be restricted to publicly maintainable adopted highway.
- 4.2.3. Requests for the addition, removal or replacement of street lights from individuals or community groups will be required to be directed through the relevant Parish, Town, City or Borough Council.
- 4.2.4. Where Lincolnshire County Council does not own the street lighting on existing highway, requests for the addition, removal or replacement of the street lights will be forwarded to the owner of the lighting.

4.2.5. Subject to Lincolnshire County Council having funding available, any all-night footway lighting may be converted to part night in areas nominated by the relevant Parish Council.

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#### 4.3. STREET LIGHTING TO IMPROVE ROAD SAFETY

4.3.1. Improvements will be considered (subject to budget constraints) where there is a night to day accident ratio greater than 2:1 and

- There is a proven accident record over the last three years bearing in mind the causes of the accidents and
- Where there have been a minimum of three separate night time injury accidents within 1km of road and
- Simpler engineering alternatives have been tried and have not been successful

4.3.2. Improvements to street lighting for road safety purposes will be subject to the availability of finance from road safety budgets.

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#### 4.4. STREET LIGHTING FOR NEW ROADS AND ROAD IMPROVEMENTS

4.4.1. Subject to environmental and cost considerations Street Lighting may be provided on new sections of road where an economic assessment carried out in accordance with the DfT standard "TA 49/07 Appraisal of New and Replacement Road Lighting" determines that there will be a cost benefit in terms of accident savings.

4.4.2. Where the application of this standard determines that lighting is not required then a separate risk assessment shall then be applied to adjacent connecting junctions, roundabouts and all other road features to ascertain lighting requirements.

4.4.3. Where street lighting is justified on a new section of road (excluding development roads) the hierarchy described in Section 4.2.1 A of this volume shall be followed.

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#### 4.5. STREET LIGHTING FOR DEVELOPMENT ROADS

4.5.1. Street Lighting will normally be provided by the developer and adopted by Lincolnshire County Council under the terms of section 38 or section 278 of the

Highways Act 1980 or section 106 of the Town and Country Planning Act 1990. On section 38 schemes, street lighting shall be part-night lit.

4.5.2. In accordance with highway adoption procedures, lighting installations on proposed highway will be adopted concurrently with the rest of the adoption.

4.5.3. The developer will be responsible for all repairs, maintenance and energy charges prior to the adoption date.

4.5.4. Lincolnshire County Council as The Highway Authority may approve installations of decorative street lighting equipment where such lighting forms part of a system of highway lighting and proposed schemes are of comparable efficiency to standard road lighting.

4.5.5. Victorian period style or contemporary styled equipment may be approved where architectural or environmental issues need to be addressed in order to maintain the character of the locality.

4.5.6. Where a developer has chosen to depart from normal standards and this departure would ultimately lead to Lincolnshire County Council incurring higher than normal maintenance costs, Developers will be charged a commuted sum.

4.5.7. Calculation of a commuted sum will be in accordance with Highways guidance document.

4.5.8. The developer shall pay electricity charges for road lighting and illuminated signs until adopted by Lincolnshire County Council.

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#### 4.6. ADOPTION OF STREET LIGHTING FROM OTHER LOCAL LIGHTING AUTHORITIES

4.6.1. Where a local authority requests Lincolnshire County Council to adopt existing street lights it shall be considered subject to budgetary constraints and formal agreement. The condition of the existing street lights will also be taken into account and may require a payment to cover the cost of bringing them up to serviceable, current standards.

4.6.2. Additional street lights on the existing highway that are financed by other local councils in Lincolnshire may be adopted and maintained by Lincolnshire County Council without a commuted sum, unless they are surrounded by an existing lighting

scheme currently owned by another authority, in which case they will be approached to take ownership.

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#### 4.7. SHARED SERVICES PROVISION

4.7.1. The street lighting service has been identified as one in which service provision can be shared between participating authorities.

4.7.2. A service level agreement relating to “Maintenance of Unmetered Open Space Lighting” has been established pursuant to and subject to the conditions set out in the Collaboration Agreement dated 4 September 2008 made by the Lincolnshire Shared Services Partnership.

4.7.3. Participating authorities may be District, Parish, Town, City or Borough councils within Lincolnshire.

4.7.4. Participating authorities will retain ownership of their street lights, pay energy charges, meet the full cost of maintenance and replacements, and meet full cost of providing additional lights including connection charges and commuted sums.

4.7.5. Should they resolve to invest in the installation of communication nodes on their street lights participating authorities may also have their lights controlled by the Lincolnshire Central Management System as and when one is implemented.

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#### 4.8. PASSIVE SAFE LIGHTING COLUMNS

4.8.1. A passive safe lighting column is designed to yield when it is struck by an errant vehicle thus making the collision less severe.

4.8.2. Passive safe columns shall be used in individual circumstances where a detailed risk assessment has taken place and there is an increased likelihood that the column may be struck by an errant vehicle.

4.8.3. In the interest of road safety the option of not replacing columns at vulnerable locations shall be considered.

## 5. INSPECTIONS

### 5.1. INTRODUCTION

5.1.1. The regime of street lighting inspection is in accordance with the budget priorities set out in 2011 (core offer review) and the one man working proposal for street lighting. This forms part of an asset management strategy intended to reduce 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 or 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 Lincolnshire County Council's inspection frequencies for Street Lighting.

|                                   |   |
|-----------------------------------|---|
| Night Time Patrols                | Every 4 Weeks   |
| Lantern (internal and external)   | Lantern cleaning is coincidental with routine maintenance inspections   |
| Routine Maintenance               | The routine maintenance frequency is commensurate with the core offer and is 6 years. A general condition inspection of the whole unit is carried out at the same time and the lamp is changed if appropriate   |
| Electrical and Structural Testing | Upon commissioning, Street Lighting units are electrically tested in accordance with BS7671 and periodically tested at routine maintenance intervals. 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. Further non-destructive structural |



|                    |  |
|--------------------|--|
|                    | testing may be necessary   |
| Response to Faults | <p>The response time is "within 2 hours".</p> <p>Lamp failure or similar non urgent faults are attended in accordance with 5.3 below.</p> <p>Electricity supply faults are restored by the electricity company, the service level is 21 working days from the time the fault is notified to the Electricity Company to the date when the said company advise that the supply has been restored</p> |

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. The following regime has been adopted in accordance with the core offer.

| Lamp Type            | Description                             | Bulk Change Interval   |                      |
|----------------------|---|------------------------|----------------------|
|                      |   | Expected Burning Hours | Bulk Change Interval |
| Low Pressure Sodium  | SOX+, SOX PSG, SOX HF, SOXE 35w and 55w | 16,000                 | 25,000               |
| Low Pressure Sodium  | 90w, 135w, 180w                         | 12,000                 | 25,000               |
| LED                  | Light Emitting Diode                    | 60,000                 | 60,000               |
| High Pressure Sodium | SONT, SONE, SONI, SONC, PIA             | 16,000                 | 25,000               |
| Low Pressure Mercury | MCF/E                                   | 12,000                 | 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. Routine Maintenance for Street Lighting consists of inspection, cleaning, lamp change where applicable, visual structural inspection, reporting and electrical testing.

### 5.3. DEFECTS

| Category 1 Emergency Defects   | Emergency Defects – 2 Hours  |
|--|--|
| <p>These defects are defined as electrical, structural or lighting defects that present an immediate danger to the highway user.</p> <ul style="list-style-type: none"> <li>• Accident damage/vandalism where live cables/voltage may be exposed or cause a column to become live.</li> <li>• Doors open or missing from street lighting columns, illuminated signs or feeder pillars</li> <li>• Lighting point structural defect caused by, RTA, vandalism or bad weather conditions.</li> <li>• Column or illuminated sign post collapse or in imminent danger of collapse</li> <li>• Illuminated traffic bollard down or missing.</li> <li>• Lanterns on street lighting Columns or illuminated signs hanging by the supply cable.</li> <li>• Lantern Bowl hanging.</li> </ul> <p>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 to a CAT 2.</p> |  |
| Category 2 Defects   | Repair or report within 24 hours of the contractor's receipt of an instruction |
| <p>Category 2 defects are those 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.</p> <ul style="list-style-type: none"> <li>• Both lights on a set of Belisha Beacons inoperative.</li> </ul>   |  |

- 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
- Regulatory sign missing or facing in the wrong direction.

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

#### Category 3 Defects

#### Non routine repairs

Repairs are scheduled into routes and reports of failures are dealt with on the next scheduled visit to the area. Each repair route is visited every two weeks.

### 5.4. CLEANING CYCLES

- 5.4.1. Cleaning and inspection of street lighting units coincide with the 6 year routine maintenance intervals.

| Design Equipment Category    | Cleaning Intervals (Months) |
|------------------------------|-----------------------------|
| Street Lighting Units        | 72                          |
| Traffic Sign Lighting Units  | 72                          |
| Illuminated Traffic Bollards | 12                          |

### 5.5. ILLUMINATED TRAFFIC SIGNS AND INTERNALLY LIT TRAFFIC BOLLARDS

- 5.5.1. The primary objective is to keep illuminated traffic signs legible, visible and effective. The maintenance regime for illuminated signs and illuminated bollards shells is indicated in the Table below:

|  |  |
|--|--|
| Night Scouting for Illumination  | In conjunction with Street Lighting inspections  |
| Routine Maintenance  | Interval in accordance with the core offer is 6 years (see 5.2.1).<br><br>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.  |

## 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.*

|                                       | Network Safety  | Network Serviceability  | Network Sustainability  |
|---------------------------------------|---|---|---|
| <b>Overall Condition Requirements</b> | <ul style="list-style-type: none"> <li>• complying with statutory obligations; and</li> <li>• meeting users' needs for safety.</li> </ul>   | <ul style="list-style-type: none"> <li>• ensuring availability;</li> <li>• achieving integrity;</li> <li>• maintaining reliability;</li> <li>• resilience; and</li> <li>• managing condition</li> </ul> | <ul style="list-style-type: none"> <li>• minimising cost over time;</li> <li>• maximising value to the community; and</li> <li>• maximising environmental contribution</li> </ul>   |
| <b>Condition of Carriageways</b>      | <ul style="list-style-type: none"> <li>• nature, extent and location of surface defects</li> <li>• nature and extent of edge defects</li> <li>• nature and extent of surface skidding resistance</li> </ul> | <ul style="list-style-type: none"> <li>• nature and extent of surface defects</li> <li>• ride quality of the surface</li> <li>• resilience of the network</li> </ul>                                    | <ul style="list-style-type: none"> <li>• surface noise attenuation characteristics</li> <li>• nature and extent of surface defects</li> <li>• nature and extent of carriageway deflection</li> <li>• usage and verge creep</li> </ul> |
| <b>Condition of Footways</b>          | <ul style="list-style-type: none"> <li>• nature, extent and location of surface defects</li> <li>• nature and extent of kerb and edging defects</li> </ul>  | <ul style="list-style-type: none"> <li>• nature and extent of surface defects</li> <li>• extent of encroachment and weed</li> </ul>   | <ul style="list-style-type: none"> <li>• convenience and ease of use</li> <li>• nature extent and location of surface defects</li> </ul>  |

|   |  |  |  |
|---|--|--|--|
|   |  | <p>growth</p> <ul style="list-style-type: none"> <li>the level of friction provided by the surface</li> <li>the quality of the surface</li> <li>integrity of the network</li> </ul>  | <ul style="list-style-type: none"> <li>extent of damage by over-running and parking</li> <li>rural footways being lost to grass ingress</li> </ul>   |
| <p><b>Condition of Cycle Routes</b></p> | <ul style="list-style-type: none"> <li>nature, extent and location of surface defects</li> <li>nature and extent of kerb and edging defects</li> </ul> | <ul style="list-style-type: none"> <li>nature and extent of surface defects</li> <li>extent of encroachment and weed growth</li> <li>the level of friction provided by the surface particularly with regard to ironwork</li> <li>the quality of the surface</li> <li>integrity of the network</li> </ul> | <ul style="list-style-type: none"> <li>convenience and integrity of the network</li> <li>nature extent and location of surface defects</li> <li>extent of damage by over-running and parking</li> <li>cycle routes being lost to grass ingress/verge creep due to usage</li> </ul> |

|   |   |  |   |
|---|---|--|---|
| <p><b>Condition of Highways<br/>Drainage System</b></p>     | <ul style="list-style-type: none"> <li>• accumulation of water on carriageways, footways and cycle routes</li> </ul>  | <ul style="list-style-type: none"> <li>• accumulation of water on carriageways, footways and cycle routes</li> </ul> | <ul style="list-style-type: none"> <li>• polluted effluent from clearing of highway drainage should not be directed into watercourses</li> <li>• 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</li> <li>• inadequate drainage of the highway structure will reduce effective life and increase maintenance liability</li> <li>• integrity of systems, root ingress, blockage / collapse, exceedance</li> </ul> |
| <p><b>Condition of<br/>Embankments and<br/>Cuttings</b></p> | <ul style="list-style-type: none"> <li>• risk of loose material falling to injure users or damage facility</li> </ul> | <ul style="list-style-type: none"> <li>• risk of damage or service interruption</li> </ul>                           | <ul style="list-style-type: none"> <li>• damage or loss of habitat</li> <li>• interruption or pollution of</li> </ul>   |

|  |  |  |   |
|--|--|--|---|
|  |  |  | <p>watercourse</p> <ul style="list-style-type: none"> <li>• extent of damage and reduced life</li> <li>• integrity of structure</li> </ul>  |
| <p><b>Condition of Landscape Areas and Trees</b></p> | <ul style="list-style-type: none"> <li>• obstruction to user visibility and legibility of traffic signs</li> <li>• fallen trees or overgrown vegetation that physically obstructs part of the highway</li> <li>• falling branches from trees</li> <li>• leaf fall from trees causing slippery surface</li> <li>• root growth affecting surface regularity</li> </ul> | <ul style="list-style-type: none"> <li>• potential for service interruption</li> <li>• quality of user experience</li> </ul> | <ul style="list-style-type: none"> <li>• landscape conservation</li> <li>• mitigation of climate change effects</li> <li>• support for habitat and biodiversity</li> <li>• problems of root growth for surface, structure and highway drainage</li> <li>• maintaining healthy trees, root severance, ivy clearance</li> </ul> |
| <p><b>Condition of Fences and Barriers</b></p>       | <ul style="list-style-type: none"> <li>• integrity and location of safety fencing for vehicles, pedestrians and all road users</li> </ul>  | <ul style="list-style-type: none"> <li>• risk of livestock disrupting traffic</li> </ul>                                     | <ul style="list-style-type: none"> <li>• appearance and condition of fencing</li> </ul>   |



|   |  |  |   |
|---|--|--|---|
| <p><b>Condition of Traffic Signs and Bollards</b></p> | <ul style="list-style-type: none"> <li>• identification of risk to users</li> <li>• separation of potential traffic conflicts</li> </ul>                             | <ul style="list-style-type: none"> <li>• contributes to ease of use</li> <li>• contributes to network integrity</li> </ul> | <ul style="list-style-type: none"> <li>• support of sustainable transport mode</li> <li>• contribution to local economy</li> <li>• heavy traffic routing can optimise maintenance</li> </ul>                  |
| <p><b>Condition of Road Markings and Studs</b></p>    | <ul style="list-style-type: none"> <li>• route delineation, particularly in darkness and poor weather</li> <li>• potential for damage and injury if loose</li> </ul> | <ul style="list-style-type: none"> <li>• ease of use, particularly in darkness and bad weather</li> </ul>                  | <ul style="list-style-type: none"> <li>• support of sustainable transport modes</li> <li>• edge delineation to reduce edge damage</li> <li>• movement of wheel tracking to reduce localised damage</li> </ul> |
| <p><b>Regulatory Functions</b></p>                    | <ul style="list-style-type: none"> <li>• risk to users and adjoining property</li> </ul>   | <ul style="list-style-type: none"> <li>• minimising and signing of obstruction</li> </ul>                                  | <ul style="list-style-type: none"> <li>• inconvenience to disabled people</li> <li>• structural damage from parked heavy vehicles</li> </ul>  |

## APPENDIX B – RESPONSE TIMES

Lincolnshire County Council's response times are based on the Council's classification of hierarchy taking into account the risk matrix laid out in *Well-Maintained Highways* which is illustrated below, assuming that a high impact defect on a lower hierarchy road will have the same potential impact but a much lower probability of causing this impact. This also correlates with the inspection frequencies of the network. The risk matrix has been taken from the previous Code of Practice *Well-Maintained Highways*, and has been updated to match Lincolnshire County Council good practice in line with the latest Code of Practice, *Well-Managed Highways Infrastructure*.

| Probability →<br>Impact ↓ | Very Low (1)   | Low (2)        | Medium (3)     | High (4)   |
|---------------------------|----------------|----------------|----------------|------------|
| Negligible (1)            | 1              | 2              | 3              | 4          |
| Low (2)                   | 2              | 4              | 6              | 8          |
| Noticeable (3)            | 3              | 6              | 9              | 12         |
| High (4)                  | 4              | 8              | 12             | 16         |
| Response                  | Category 2 (L) | Category 2 (M) | Category 2 (H) | Category 1 |

*Risk Matrix for Lincolnshire County Council*

Lincolnshire County Council's Category 1 and Category 2 defects are defined in the table below:

| Lincolnshire County Council Standard  |
|---|
| <p><b>Category 1</b></p> <p>Category 1 defects should be corrected or made safe at the time of the inspection, if reasonably practicable. In this context, making safe may constitute displaying warning notices, coning off or fencing off to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of inspection, which will generally be the case, repairs of a permanent or temporary nature should be carried out within a period of 24 hours. Permanent repair should be carried out within 28 days.</p> |

## Category 2

Category 2 defects are those which, following a risk assessment, are deemed not to represent an immediate or imminent hazard or risk of short term structural deterioration. Such defects may have safety implications, although of a far lesser significance than Category 1 defects, but are more likely to have serviceability or sustainability implications. These defects are not required to be urgently rectified, and those for which repairs are required shall be undertaken within a planned programme of works, with the priority as determined by risk assessment. These priorities together with access requirements, other works on the road network, traffic levels, and the need to minimise traffic management, should be considered as part of the overall asset management strategy. The programmes of work for their rectification should be part of the HIAMP.

Category 2 defects are categorised according to priority with maximum response times of 7 days, 28 days, 90 days or potential planned programme, based on the risk probability and its likely impact.

## Emergency Response

The following is a list of response times relating to Highway maintenance activities, that includes but is not limited to items covered in safety inspections. This table forms Lincolnshire County Council's 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.

In the notes field, some defects are identified as emergencies. These particular defects have been singled out as particularly high risk, and will be dealt with expeditiously but in all cases within 24 hours. They have been identified taking into account the likely risk; risk management always needs to take account of particular circumstances therefore it is possible other situations could be considered as emergencies. Defects notified by the emergency services are also considered to require an urgent response which complies with guidance in the previous Code of Practice *Well Maintained Highway Infrastructure*. Although the new Code of Practice no longer stipulates these requirements, Lincolnshire County Council still considers them to be good practice.

## Escalation Process

These timescales commence at the point in time that the Council has knowledge of the defect. The Highways officer then undertakes a risk assessment and as a consequence categorises the defect. The HO has the opportunity to escalate a defect to a 1 or 2 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<br>(mm = depth/height)  | Major Road<br>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                     | 90 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                     | 90 days                     | 90 days                     | Potential Planned Programme | Potential Planned Programme |
| Ironwork raised/sunken less than 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 |
| 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 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 |

Highway Infrastructure Asset Management Plan (HIAMP)

|  |                             |                             |                             |                             |                             |                             |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Other abrupt level difference greater than 40mm</b>   | 24 hours                    | 24 hours                    | 7 days                      | 7 days                      | 28 days                     | 28 days                     | 90 days                     | Potential Planned Programme | Potential Planned Programme |
| <b>Edge damage greater than 40mm breaking edge white line</b>  | 24 hours                    | 24 hours                    | 7 days                      | 7 days                      | 28 days                     | 90 days                     | 90 days                     | Potential Planned Programme | Potential Planned Programme |
| <b>Edge damage greater than 40mm encroaching more than 100mm into metalled surface (no white line)</b> | 24 hours                    | 24 hours                    | 7 days                      | 7 days                      | 28 days                     | 90 days                     | 90 days                     | Potential Planned Programme | Potential Planned Programme |
| <b>Edge damage less than 40mm</b>  | 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 |
| <b>Missing/Defective road studs</b>  | 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 |
| <b>Severe loss of chippings on carriageway surface</b>   | 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 |
| <b>Surface issues (non-winter maintenance)</b>   | 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 |

\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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).

| Footways*                                |                             |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Categories                               | Hierarchy 1                 | Hierarchy 2                 | Hierarchy 3                 | Hierarchy 4                 |
| Ironwork Collapsed/missing/broken        | 24 hours                    | 24 hours                    | 24 hours                    | 24 hours                    |
| Pothole greater than 25mm                | 24 hours                    | 24 hours                    | 24 hours                    | 24 hours                    |
| Ironwork raised/sunken greater than 25mm | 24 hours                    | 24 hours                    | 24 hours                    | 24 hours                    |
| Trip greater than 25mm                   | 24 hours                    | 24 hours                    | 24 hours                    | 24 hours                    |
| Loose/Rocking/missing kerb stone         | 24hours                     | 7 days                      | 7 days                      | 28 days                     |
| Pothole Less than 25mm                   | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme |
| Trip less than 25mm                      | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme |
| Ironwork raised/sunken less than 25mm    | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme | Potential Planned Programme |

\*\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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 |

\*\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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).

| 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 |

\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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/Lines*   |                             |                             |                             |                             |                             |                             |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Categories   | Major Road Network          | Hierarchy 1                 | Hierarchy 2                 | Hierarchy 3                 | Hierarchy 4                 | Hierarchy 5                 | Hierarchy 6                 | Hierarchy 7                 | Hierarchy 8                 |
| Missing / damaged non illuminated Stop, One Way, No Entry, Give Way sign | 7 days                      | 7 days                      | 7 days                      | 7 days                      | 28 days                     | 90 days                     | 90 days                     | 90 days                     | Potential Planned Programme |
| Missing / 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 / missing non-illuminated street furniture (LCC 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 |
| 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 / vandalism to street furniture (LCC asset)           | 90 days                     | 90 days                     | 90 days                     | 90 days                     | 90 days                     | 90 days                     | 90 days                     | Potential Planned Programme | Potential Planned Programme |

\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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).

| Verges                 |                    |             |             |             |             |             |             |                                   |                                   |
|------------------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|-----------------------------------|
| Categories             | Major Road Network | Hierarchy 1 | Hierarchy 2 | Hierarchy 3 | Hierarchy 4 | Hierarchy 5 | Hierarchy 6 | Hierarchy 7                       | Hierarchy 8                       |
| <b>Collapsed verge</b> | 24 hours           | 24 hours    | 24 hours    | 24 hours    | 24 hours    | 24 hours    | 24 hours    | Potential<br>Planned<br>Programme | Potential<br>Planned<br>Programme |

\*Highways Officers' decision to instigate the make safe process = 1 or 2 hour(s) 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.

| Issue                         | Check  | Action   |
|-------------------------------|--|--|
| <b>Scope and Scale</b>        |  |  |
| 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.        |
| <b>Design Aspects</b>         |  |  |
| Pedestrians and cyclists      | Do footways and cycle routes fit the actual paths used?  | Redesign to reflect actual paths to avoid erosion and later replacement.                           |
| 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.   |
| <b>Maintenance Operations</b> |  |  |
| 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  | Identify cost of specialist regime   |

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|                               | specialist cleansing 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. |
| Maintenance access            | Is there safe and convenient access for plant and personnel?                                     | Redesign scheme to provide safe and convenient access.   |
| <b>Materials and products</b> |  |  |
| 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/product approach the failure condition – slowly/quickly?                       | Programme safety and service inspections on basis of risk assessment.  |
| Life extension                | Are there 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.  |
| <b>Reuse and Recycling</b>    |  |  |
| 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 Highways Infrastructure Asset Management Plan, publically 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  |
|--|---|
| <b>Highway</b>                         | Road or Street  |
| <b>Carriageway</b>                     | Facilities used by motorised vehicles   |
| <b>Footway</b>                         | Part of a highway over which the public have a right of way on foot only, e.g. segregated surfaced paths used by pedestrians. Commonly understood as the term pavement  |
| <b>Pavement</b>                        | Footway   |
| <b>Remote Footway</b>                  | A footway which is not immediately adjoining a carriageway  |
| <b>Housing Footway</b>                 | 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  |
| <b>Footpath</b>                        | Known as majority of Public Rights of Way (PROW)  |
| <b>Cycle Route</b>                     | 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   |
| <b>Running Surface (Industry term)</b> | All hardened surfaces within the highway, including carriageways, footways and cycle routes   |
| <b>Pavement (Industry term)</b>        | Construction of running surfaces, particularly carriageways   |
| <b>Safety Inspections</b>              | 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. Lincolnshire County Council combines its Safety and Service inspections into one overlapping inspection regime. |
| <b>Service Inspections</b>             | 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  |

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|  | availability and reliability.   |
| <b>Condition Surveys</b>                 | 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.   |
| <b>Bridge</b>                            | A structure with a span equal to or greater than 1.5m spanning and providing passage over an obstacle, e.g. watercourse, railway, road, valley. This category also covers subways, footbridges and underpasses  |
| <b>Cantilever Road Sign</b>              | A structure with a single support that projects over the highway in order to carry a traffic sign   |
| <b>Cellar or Vault</b>                   | An underground room or chamber with a maximum plan dimension of 1.5m or more  |
| <b>Culvert</b>                           | 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 |
| <b>Drainage</b>                          | Span or diameter less than 0.60m  |
| <b>Retaining Wall</b>                    | 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  |
| <b>Road Tunnel</b>                       | A tunnel with an enclosed length of 150 metres or more through which a road passes  |
| <b>Sign/Signal Gantry</b>                | A structure spanning the highway, the primary function of which is to support traffic signs and signalling equipment  |
| <b>General Inspection (Structures)</b>   | A visual inspection of representative parts of the structure. These are carried out on all structures regardless of ownership   |
| <b>Principal Inspection (Structures)</b> | A close inspection (within 1m) 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 5m. Structures with spans less than 5m will be subject to a risk assessment.                                   |

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| <b>Special Inspection (Structures)</b>    | 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.   |
| <b>Acceptance Inspection (Structures)</b> | 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

## VOL 0 – OVERARCHING PRINCIPLES

| Legislation and Guidance                                     | Definition  |
|--|---|
| <b>Health and Safety at Work Act 1974</b>                    | 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.   |
| <b>Construction (Design and Management) Regulations 2015</b> | 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.   |
| <b>Localism Act 2011</b>                                     | 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.  |
| <b>Local Government Act 2000</b>                             | 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: <ul style="list-style-type: none"> <li>• Statutory basis Local Government Act 1999</li> <li>• Best Value Performance Plans</li> <li>• Reviews of all services on five year cycle</li> <li>• Statutory Inspection by Audit Commission</li> <li>• Statutory Framework of Best Value Performance Indicators</li> </ul> |
| <b>Highways Act 1980</b>                                     | 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   |
| Section 58   | Defence against action relating to alleged failure to maintain  |
| <b>Traffic Management Act 2004</b>                           | Sets out a number of provisions including Highways England 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  |
| <b>New Roads and Streetworks Act 1991</b>                    | 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   |



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| <b>Countryside and Rights of Way Act 2000</b>                | Authorities are required to maintain records and ensure that ways are adequately signposted, maintained and free from obstruction.   |
| <b>Road Traffic Regulation Act 1984</b>                      | Provides the powers to regulate or restrict <b>TRAFFIC</b> on UK <b>ROADS</b> , in the interest of safety  |
| <b>Traffic Signs Regulations and General Directions 2016</b> | Prescribes the design and conditions of use of traffic signs on or near roads in England, Scotland and Wales.  |
| <b>Road Traffic Act 1988</b>                                 | 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          |
| <b>Road Traffic Reduction Act 1997</b>                       | 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 |
| <b>Flood and Water Management Act 2012</b>                   | Aims to reduce the flood risk associated with extreme weather. Provides for better, more comprehensive management of flood risk for people, homes and businesses   |
| <b>Transport Act 2000</b>                                    | Designation of quiet lanes or a home zones   |
| <b>Wildlife and Countryside Act 1981</b>                     | Environmental and countryside issues with which highways operations must comply  |
| <b>Environmental Protection Act 1990</b>                     | Provides the statutory basis for other environmental issues, in particular waste management, with which highway maintenance operations must comply   |
| <b>Clean Neighbourhoods and Environment Act 2005</b>         | Provides local authorities with more effective powers to tackle poor environmental quality and anti-social behaviour   |
| <b>Equality Act 2010</b>                                     | Legally protects people from discrimination in the workplace and in wider society  |
| <b>Criminal Justice and Public Order Act 1994</b>            |  |
| <b>Human Rights Act 1998</b>                                 | Sets out the fundamental rights and freedoms that everyone in the UK is entitled to  |
| <b>Freedom of Information Act 2000</b>                       | Provides public access to <b>INFORMATION</b> held by public authorities, who are obliged to publish certain <b>INFORMATION</b>   |

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|                                     | about their activities. Also members of the public are entitled to request <b>INFORMATION</b> from public authorities |
| <b>Civil Contingencies Act 2004</b> | Delivers a single framework for <b>CIVIL</b> protection in the UK   |

Some definitions taken from <http://www.legislation.gov.uk>

## VOL 1 - HIGHWAYS

| Legislation and Guidance                   | Definition  |
|--|---|
| <b>Highways Act 1980</b>                   | Sets out the main duties of Highway Authorities in England and Wales  |
| Section 41                                 | Duty to maintain highways maintainable at public expense  |
| 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 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  |
| <b>Traffic Management Act 2004</b>         | Duty for all local traffic authorities in England to manage the network effectively to keep traffic moving  |
| <b>New Roads and Street Works Act 1991</b> | 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. |
| <b>Roads (Scotland) Act 1984</b>           | 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                              |

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| 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 |
| <b>Railways and Safety Transport Act 2003</b>                    | To make provision about railways, including tramways; to make provision about transport safety; and for connected purposes.  |
| <b>Roads (Northern Ireland) Order 1993 SI 1993/3160 (NI 15)</b>  |  |
| 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 |
| <b>UKRLG Highway Infrastructure Asset Management Guidance</b>    |  |
| <b>The Weeds Act 1959</b>  | Empowers DEFRA to serve notice requiring an occupier of land to take action to prevent the spread of certain specified weeds   |
| <b>Wildlife and Countryside Protection Act 1981 – Section 14</b> | 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 & Statement up to date   |
| <b>Countryside Act 1968 (Section 27)</b>                         | Duty to signpost public rights of way  |

Some definitions taken from <http://www.legislation.gov.uk>

## VOL 2 – STRUCTURES

| <b>Legislation and Guidance</b> | <b>Definition</b>  |
|---------------------------------|--|
| <b>Highways Act 1980</b>        | 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                      | Where any part of a highway is carried by a bridge over a railway, canal, inland navigation, dock or harbour or forms the approaches |

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|   | 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   |
| 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 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   |
| <b>Local Government Act 1972</b>          | Advises limited flexible powers for local authorities to provide certain archives services  |
| Section 111                               | Bridges under the highway   |
| <b>Trunk Roads Act 1946 – Section 7</b>   | Adoption by the strategic Highway Authority of all private bridges for Trunked roads  |
| <b>The Transport Act 1968 – Part VIII</b> | Bridges and level Crossings etc   |

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| <b>Traffic Signs Manual Chapter 4</b>  | Signing Guidance   |
| <b>The Railway Bridges (Load Bearing Standards) (England and Wales) Order 1972 (SI 1072 No. 1705)</b>                      |  |
| <b>ADEPT/Network Rail Protocol</b>   | Minimising risk of bridge strikes  |
| <b>BS EN 1991-2</b>  | Models of traffic loads for the design of road bridges, footbridges and railway bridges  |
| <b>Road Traffic Regulation Act 1984 – Section 1 and 2</b>  | Weight Restriction Orders  |
| <b>The Road Vehicles (Construction and Use) Regulations 1986 or the Road Vehicles (Authorised Weight) Regulations 1998</b> |  |
| <b>BD 21 and BA 16</b>   | Weak Bridge warning signs and other appropriate mitigating solutions Guidance Document   |
| <b>Roads (Scotland) Act 1984 – Section 66</b>  | Maintenance of vaults and cellars etc  |
| <b>Coast Protection Act 1949 as amended by Section 36 of the Merchant Shipping Act 1988</b>                                | Safety of navigation   |
| <b>Food and Environmental Protection Act 1985 Part II</b>  | Deposits in the sea  |
| <b>Party Wall Act 1996</b>   | Requires the issue of statutory notices when work affects adjacent properties within 3 metres of any construction works or within 6 metres if affecting foundation support |
| <b>Climate Change Act 2008</b>   | Sets national targets for the year 2050 for the reduction of greenhouse gas emissions  |
| <b>Planning (Listed Building and Conservation Areas) Act 1990</b>  | Requires each authority to compile a list of buildings of special interest, either historic or architectural   |

Some definitions taken from <http://www.legislation.gov.uk>

## VOL 3 – STREET LIGHTING

| Legislation and Guidance  | Definition  |
|---|---|
| <b>Highways Act 1980</b>  | Empowers Lincolnshire County Council 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 Lincolnshire County Council.<br>On section 38 schemes, street lighting shall be part-night lit  |
| <b>Public Health Act 1961</b>   |   |
| Section 45  | Attachment of street lamps to buildings   |
| Section 81  | Summary recovery of damages for negligence  |
| <b>Roads (Northern Ireland) Order 1993 – Article 44</b>   | Grants the Department for Infrastructure the power to provide road lighting, where the Department considers that any road should be illuminated.  |
| <b>Roads (Scotland) Act 1984 – Section 35</b>   | 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.  |
| <b>New Roads and Street Works Act 1991</b>  | Enabling act setting out the duties of Street Authorities to coordinate and regulate works carried out in the highway   |
| <b>Electricity Safety, Quality and Continuity Regulations 2002</b>  | Recording of all underground cables   |
| <b>Code of Practice for Recording of Underground Apparatus in Streets.</b>  | Recording of all underground cables   |
| <b>Clean Neighbourhoods and Environment Act 2005 – Section 102</b>  | States that artificial light is a potential statutory nuisance  |
| <b>Conservation (Natural Habitats, &amp;c) Regulations 1994</b><br><br><b>2007 European Protected Species of Plants and Animals</b> | 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. |
| <b>Traffic Management Act 2004</b>  | Local Authorities have a duty to enforce network management for the maintenance of records and information (e.g. including  |

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|  | records and locations of apparatus) and to inspect the records   |
| <b>Climate Change Act 2008</b>                               | <p>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.</p> <p>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.</p> |
| <b>Crime and Disorder Act 1998 – Section 17</b>              | Duty to consider crime and disorder implications. The Crime and Disorder Act does not apply to Scotland or Northern Ireland.   |
| <b>Traffic Signs Regulations and General Directions 2016</b> | Prescribes the design and conditions of use of traffic signs on or near roads in England, Scotland and Wales.  |
| <b>Civic Amenities Act 1967</b>                              | 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.’  |
| <b>Electricity at Work Regulations 1989</b>                  | Requires all systems to be constructed, maintained and operated as is reasonably practicable to prevent danger.  |
| <b>BS 7671 Requirements for Electrical Installations</b>     | States that installations which conform to the standards laid down in BS 7671:2008 are regarded by HSE as likely to achieve conformity with the relevant parts of the Electricity at Work Regulations 1989   |
| <b>Regulation 16 of the Electricity at Work Regulations</b>  | 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”  |

Some definitions taken from <http://www.legislation.gov.uk>



## APPENDIX F – ACTION PLAN

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| <i>Asset Management Policy and Strategy Update</i>        | Begin engagement for the update of these documents in line with the Council Vision and emerging Corporate Plan and in response to central government funding changes. To update for 2022.                                      | Apr-22  |
| <i>Review Footways</i>                                    | Consider footway hierarchies, defects, response times and maintenance strategy.  | Oct-21  |
| <i>Cycleway Focus</i>                                     | Identify cycleway locations, consider establishing unique asset identification and review defect categories/response times.  | Apr-22  |
| <i>Response Times Development</i>                         | Continually monitor suitability of current response times and deal with any requests for change.   | Ongoing |
| <i>Boundary Alignment</i>                                 | Lincolnshire County Council 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 |
| <i>Drainage Asset Capture – develop targeted approach</i> | Develop criteria for a more targeted approach to drainage and gully cleansing with contingency for flooding or prolonged periods of rain.  | Apr-22  |
| <i>Winter Service Plan – route based forecasting</i>      | Review the 20/21 service. Consider the effectiveness of the reduction in rate of spread of treated salt and reduction in temperature intervention threshold. Review national guidance and benchmarking with other authorities. | Oct-21  |
| <i>HIAMP 'lite'</i>                                       | Provide smaller information booklet for officers for ease of use on site or through tablet viewing.  | Apr-22  |

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| <i>Standards and Enforcement Plan</i>     | Continue to develop a Standards and Enforcement Plan  | Apr-22 |
| <i>Safety/Service Inspections</i>         | Monitor effectiveness of real time risk assessment and works ordering through handheld devices both for inspectors and contractor side.   | Apr-22 |
| <i>Develop a Data Management Strategy</i> | Develop a robust evidenced plan of how the Service manages data in terms of security and what the Highways Service utilises all data for. | Apr-22 |
| <i>Annual Review of Asset Management</i>  | Publish the 1 <sup>st</sup> of the annual reviews of Highways Asset Management for Lincolnshire   | Jun-21 |