



Maintenance & Inspections Strategy:

Street Lighting

February 2021



Essex County Council

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Contents

Maintenance & Inspections Strategy: Street Lighting	1
1.1. Introduction	1
1.2. Essex Street Lighting Network	1
1.2.1. Street Lighting Asset Management System	2
1.2.2. Part-night Lighting	2
1.3. Inspection – Strategy and Service Levels	2
1.3.1. General Principles for Completion of Inspections	2
1.3.2. Inspection Frequency	3
1.3.3. Electrical Inspection and Testing	3
1.3.4. Structural Inspection and Testing	4
1.3.5. High Mast Lighting	4
1.4. Defects	5
1.4.1. Central Management System (CMS)	5
1.4.2. Defect Reporting	6
1.4.3. Defect Prioritisation	6
1.4.4. Capital Replacement Programme	7
1.5. Non-Routine Maintenance	8
1.5.1. Illuminated Bollards	8
1.5.2. Illuminated Signs	8
1.5.3. High Masts	8
1.5.4. Dual Carriageways	8
1.5.5. Performance Management	9
1.5.6. Key Roles and Competencies	9

Maintenance & Inspections Strategy: Street Lighting

1.1. Introduction

The Essex County Council (ECC) Highways Street Lighting Maintenance & Inspections Strategy has been reviewed to take account of the recommendations and best practice set out in the “Well-managed Highway Infrastructure: A Code of Practice”.

The Code of Practice is designed to promote the adoption of an integrated asset management approach to highway infrastructure based on the establishment of local levels of service through risk-based assessment.

This document supports the overarching ECC Highways Maintenance Policy. It sets out and describes the service levels relating to our risk-based approach to managing how it organises and maintains the Street Lighting Network it is responsible for.

Alongside this strategy will be supporting documents that sets out the process & procedures to be operated.

This strategy covers the following key areas:

- Network
- Inspections and testing
- Defects
- Maintenance

1.2. Essex Street Lighting Network

Essex is the third largest local lighting authority in the country. As of March 2020 the number of assets for which ECC is responsible for is approximately:

- 130,000 street lights
- 12,000 illuminated signs
- 3,800 illuminated bollards

ECC is not responsible for all of the street lights within the county on adoptable highway; parish/town and district/borough councils own and maintain street lights as well. If it has been established that the highway is either private or not adopted by ECC, then the responsibility remains with the asset owner. This may mean that residents are required to conduct further research to establish who has responsibility for the lights. ECC is unable to assist further with the ownership of the street lights under these circumstances.

1.2.1. Street Lighting Asset Management System

ECC uses a dedicated asset management system for its street lighting operations called Mayrise. Only ECC-owned street lighting assets are recorded on Mayrise however references to street lights owned by others may be made.

Mayrise is regularly reviewed to ensure the data is kept current and accurate. The Asset Management Lighting team endeavours to ensure that any street lighting assets adopted by ECC are recorded on Mayrise. This is essential to ensure that management of the maintenance process meets legal obligations and provides information for the calculation and tendering for electrical energy.

Mayrise holds data that includes dated records of operations or repairs carried out including both routine and non-routine maintenance.

1.2.2. Part-night Lighting

ECC operate part-night lighting in certain areas of the county in accordance with the published exception criteria, which can be found on the ECC's website.

1.3. Inspection – Strategy and Service Levels

1.3.1. General Principles for Completion of Inspections

ECC requires that inspections are carried out by trained personnel in the manner deemed appropriate for the particular inspection type. The safety of the highway officer will always be of paramount consideration in determining the method of inspection.

Inspections fall into the following types:

- Electrical Inspection and Testing
- Structural inspection and Testing
- High Mast Inspection

In addition to the inspections listed above, street lighting assets are also visually inspected for obvious signs of damage and condition as part of the routine safety inspections carried out by Highway Inspectors (HI) as per the ECC "Maintenance & Inspections Strategy: Carriageways, Footways & Cycleways". The frequency of these inspections depend on the hierarchy and type of network on which the asset is situated.

In the event of conditions that affect business continuity for example, severe weather events, the inspections may be suspended and re-programmed.

1.3.2. Inspection Frequency

The inspection frequency (table below) is aligned to various inspection requirements affecting Street Lighting.

Sub Feature	Inspection Type	Inspection frequency
Electrical Inspection and Testing	Testing	6 Yearly
Structural Inspection and Testing	Visual Inspection Non-metallic Column Testing Metallic Column Testing	As per HI functional route hierarchy, detailed in 1.3.1 3 Yearly 6 Yearly
High Mast Inspection	Annual Inspection Principal Inspection	12 Monthly, detailed in 1.3.5.1 4 Yearly, detailed in 1.3.5.2

As far as possible inspections are planned to maximise efficiency with all inspections undertaken within the calendar month that they are due. However, the programme will need to remain flexible due to unforeseen events.

1.3.3. Electrical Inspection and Testing

In order to comply with the requirements of the relevant legislation and regulations, a 6 year rolling programme of inspection, testing and selected remedial works on the entire network of the Councils owned street lighting assets shall be carried out.

1.3.3.1. Electrical Dangerous Situations

During the course of electrical testing, if a situation is observed where immediate public danger is apparent then that hazard shall be eliminated or guarded. The danger shall be immediately reported and the term maintenance contractor or the Distribution Network Operator (DNO) shall be arranged to respond.

1.3.3.2. Electrical Testing Requirements

All equipment shall be electrically tested in accordance with the appropriate clauses of the latest version of all relevant codes/standards.

1.3.3.3. Electrical Defects

During the testing programme, any electrical defects as detailed in the relevant standards that are found shall either be resolved at the time of the test where reasonably practicable or reported to the DNO.

1.3.4. Structural Inspection and Testing

ECC carries out inspections and testing to ensure the structural integrity of the street lighting assets are maintained.

Inspections are carried out utilising the guidance provided within the latest version of all relevant codes/standards. ECC intends to identify those inspection and testing parameters in a Non Destructive Testing (NDT) manner.

The structural defects shall be separated into the following levels of condition:

Defect Category	Response	Criteria
Emergency Red	Shall be attended to as soon as operationally possible	Whilst the routine inspection is taking place the structure is found to be too dangerous state to be left
Red	Shall form part of the annual capital replacement programme	Loss of original thickness in the root of the street light $\geq$ 50%
Amber	Requires further investigation but if not rectified within 3 years it shall be retested	Loss of original thickness in the root of the street light between 10% and 49%
Green	Satisfactory until next planned inspection/test (6 years)	Loss of original thickness in the root of the street light below 10%
Observations (at the time of test)	Conditions that will reduce the effectiveness of the asset	Unable to test due to vegetation, unable to locate, blocked shaft etc..

1.3.5. High Mast Lighting

All high mast lighting shall be inspected in accordance with the latest version of all relevant codes/standards. A specialist contractor shall be employed to carry out this function countywide.

1.3.5.1. Annual Inspections

Annual inspections to high mast lighting assets will be carried out according the relevant guidance and in general consists of a ground level visual inspection of most elements as recommended.

1.3.5.2. Principal Inspections

Principal inspections to high mast lighting assets consist of all that is included in the annual inspection, while additionally utilising the use of a Mobile Elevated Working Platform (MEWP) to further inspect elements not visible from the ground.

During Principal Inspections a full structural visual inspection will also be carried out in accordance with recommended guidance.

1.4. Defects

1.4.1. Central Management System (CMS)

ECC have one of the largest central management systems in the world which helps to control the street lighting more efficiently. Sensors on the top of each street light detects certain faults/issues, shown below, and sends a report to the asset management system which are then categorised, prioritised and issued accordingly by the Street Lighting Operational Team.

Item	Defect	Investigatory level
Lamp	Lamp failed	Defect present
	Lamp cycling	Defect present
	Lamp day burning	Defect present
	Mains power brownout	Defect present
	Telecell internal temperature too high	Defect present
	Monitoring data missing (no contact for period)	Defect present
Power/Performance Issues		

As well as those defects identified by the CMS the Council also receives notification of possible defects from:

- The Highway Inspection Team
- Highways Out of Hours service
- Members of the Public
- Defects recorded during Electrical and Structural tests
- Defects recorded during High Mast Inspections
- Emergency Services
- Other councils (parish, town etc.) MPs and Councillors

1.4.2. Defect Reporting

ECC receives defect reports and enquiries relating to condition concerns from a number of sources regarding its highway street lighting assets. Due to their nature urgent reports cannot be reported online and the website provides the contact number for the customer to call to report anything that in their opinion is urgent. These types of defects tend to be physical defects such as, but not limited to;

- Leaning columns
- Column damage
- Door open/missing
- Exposed wiring
- Damaged lantern

Any enquiry relating to a street lighting asset must be passed on to the Street Lighting Operational Team to assess, this includes enquiries received out of hours.

The Street Lighting Operational Team shall assess the defect enquiry based on its priority to attend site.

Urgent	Urgent enquiries will be assessed the same working day. *
Standard	Defect to be considered for repair as part of a planned maintenance programme.

**During periods of high demand such as the period after severe weather it may not be possible to comply with these response times.*

1.4.3. Defect Prioritisation

Defects will be defined as follows;

Priority A defects are those require emergency attendance as they represent an immediate or imminent safety hazard such as risk of short-term structural failure and imminent risk of electric shock.

Priority B defects are those that require urgent attendance due to identification of a safety hazard, where the risk is assessed to not be immediate or imminent.

Priority C defects are those of low risk of causing harm and are considered to be defects that impact long term serviceability and sustainability of the highway asset. These defects shall be addressed in a planned manner as resources permit please see the below for examples.

A	B	C
Unit Damaged	Door Off	Lamp Failed/Not Working
Lantern Hanging (5m+)	All Lights Out	Lamp Day Burning
Exposed Live Electrical Conductors	Belisha Beacon Globe Missing	Replace Lantern

The response time is defined as the time taken to attend site from the time the defect is reported to the Street Lighting Operational Team.

Emergency attendance to dangerous equipment shall be either 2 hours (A) or 24 hours (B) depending on the type of damage. A higher priority is given to faults that could be considered more dangerous such as exposed electrical wiring and the location of the column etc.

The competent person attending site shall be equipped to ensure the site can be made safe or they shall remain on site until the situation is resolved (the latter may be if a team with different equipment/vehicle is required or if the DNO is required to attend site to make their equipment safe).

Defect Priority	Attendance time
A	2hr*
B	24hr*
C	Defect to be considered for repair as part of a planned maintenance programme.

**During periods of high demand such as the period after severe weather it may not be possible to comply with these response times.*

1.4.4. Capital Replacement Programme

The Asset Management Lighting team shall analyse the data provided by the structural testing & inspection regime and produce an annual replacement programme in relation to the available capital funding.

The programme shall be prioritised in order of the nature of the defect categories i.e. all “Reds” would initially be considered followed by “Ambers”.

The targeting “Ambers” when funds are available will reduce the number of future Reds. Where the majority of columns in a road are defective (reds and high ambers), consideration shall be given to changing all columns in the road.

Where funding is limited “Reds” shall be prioritised.

1.5. Non-Routine Maintenance

1.5.1. Illuminated Bollards

Any damaged illuminated bollards and the associated electrical equipment shall be replaced with a non illuminated, self righting, reflective bollard. When changed, the bollard shall be recorded as being non-illuminated and shall be maintained by the routine highways maintenance team.

1.5.2. Illuminated Signs

Where a replacement sign light is required, an LED sign light shall be used if the sign requires illumination under latest version of all relevant codes/standards. The maintenance or replacement of any highways signage is managed by the routine highways maintenance team.

1.5.3. High Masts

High masts are major structures that require specialised maintenance. Their heights range from 16 to 30m with their lights being on an assembly which is winched into place. They are normally used in large areas like dock yards, airports etc. however during the 80/90’s there was a fashion to use them for road lighting. We currently have 36 across Chelmsford, Harlow and Basildon.

The non-routine replacement of lamps shall only be carried out when more than 25% of the total number of LED Lanterns on the individual mast are not operating correctly.

1.5.4. Dual Carriageways

The non-routine maintenance operations on dual carriageways shall be, where possible, incorporated with other highway maintenance functions carried out on the road to reduce traffic management costs.

1.5.5. Performance Management

The performance of the Street Lighting Operation Team is monitored via Key Performance Indicators.

1.5.6. Key Roles and Competencies

There is a dedicated team whose main function is undertaking street lighting maintenance and reactive ad hoc inspections in accordance with this strategy. All members of the team shall be assessed and receive appropriate training for all tasks undertaken to ensure they meet the minimum required standards for their role and specific tasks.

In addition, all operational site staff, supervisors, managers and as appropriate sub-contractors shall be correctly registered to the appropriate and relevant professional bodies and hold the qualifications as required by the relevant codes/standards.

The safety of the site staff will always be of paramount consideration in determining the method of inspection or testing and any maintenance works.

This information is issued by:
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