WOKINGHAM
BOROUGH COUNCIL

HIGHWAY MAINTENANCE

MANAGEMENT PLAN

VOLUME 8

STREET LIGHTING

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HIGHWAY MAINTENANCE MANAGEMENT PLAN

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HIGHWAY MAINTENANCE MANAGEMENT PLAN

VOLUME 8 - STREET LIGHTING

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VOLUME 8 - STREET LIGHTING

1. Service Planning

1.1 Service Objectives

The street lighting service seeks to support the council's priorities of ensuring strong, sustainable communities and tackling traffic congestion through the following objectives:

i. Manage the council's street lighting asset
ii. Minimise the council's street lighting asset's impact on the environment

The council has the following Duty of Care responsibility as the local Highway Authority:

i. The Highways Act 1980 Section 97 empowers a Highway Authority to provide lighting for a highway under its jurisdiction but does not place a statutory duty to provide lighting.
ii. Under the Highways Act 1980 Section 129 Part V the Highways Authority (or Street Lighting Authority) is not liable for accidents arising from a failure to light unless they have done something to actually make the street dangerous.
iii. There is however a clear duty to warn by means of lighting or otherwise of any obstructions or dangers that have been created.

1.2 Light Pollution

In order to minimise the visual impact of the street lighting on the natural environment, the council will utilise the Environmental Zones, as defined by the Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light, when evaluating lighting schemes and complaints over light levels. These are:

i. Roads in Countryside Areas (E1) – National parks, areas of outstanding natural beauty, generally considered to be intrinsically dark areas and not lit.
ii. Roads in Countryside Areas (E2) – Rural or small village locations, generally not lit, except where road safety problems can be demonstrated
iii. Roads in Suburban Areas (E3) – Small town centre or suburban locations (residential and commercial), generally lit to British and European (BS EN) code standards relevant at the time; at the council's discretion site specific assessment may also apply.
iv. Roads in Urban Areas (E4) – Town or city centres with high levels of night-time activity generally lit to British and European (BS EN) code standards relevant at the time; at the council's discretion site specific assessment may also apply, esp.
with regard to historic areas.

v. Motorway and trunk roads are maintained by the Highways Agency. The agency's policy with regard to the lighting of these roads is separate from that of the council.

To further ensure minimum environmental pollution to the night sky, the amount of upward light from the lantern should be kept to a minimum. Refer to the Highway Design Guide Street Lighting Specification for details of street lighting equipment.

1.3 Quality of Light

To improve the quality of the street lighting in the borough, upgraded and new street lighting schemes will seek to minimise the amount of street light needed whilst providing a better light appearance through the use of white light. White light is defined by the ILP as having a colour rendering index (Ra) greater than 60. White light sources include discharge lamp type, i.e. ceramic discharge metal halide (CDM), compact fluorescent (PLT), and some high pressure sodium (SON), light emitting diodes (LED) etc. White light offers the following advantages:

i. Humans see better under white light, as it renders colours more accurately
ii. Lower light levels can be used to achieve the same lighting standards within the BS EN 13201:2003 as colours/objects are rendered more accurately

When the council chooses to exercise its power to light a highway, BS EN is generally used as guidance, but not as a legal requirement. All new street lighting provided on the highway should be designed and installed to the current British Standard and/or European Norm (BS EN) appropriate for the road in question, with consideration given to existing column spacing in the area of the new lighting. Where existing street lighting is upgraded to meet the aims of the service, use of the existing column spacing is preferred to changing the arrangements to meet the relevant BS EN standard. Consideration in determining spacing should also be given to the Highways Act. Signage layouts in areas with restricted speed limits need a maximum street lighting column spacing of 60 m. Refer to the Highway Design Guide Street Lighting Specification for details of street lighting equipment.

1.4 Part-Night Lighting and Dimming

Part-night lighting is a principle adopted by the council in order to use night time lighting only where needed. Any light can be considered for part night operation, i.e. be switched off from 00:30am to 5:30am. In new developments and as the existing street lighting asset is replaced, the methodology below will be followed:

i. Generate list of street lights that may be suitable for part-night operation Consult with the Police
ii. Conduct safety audits for all suitable street lights based on exemption criteriaPrepare communications to the public
iii. Convert or re-programme street lights
iv. Monitor crime and safety levels on part night streets
v. Reinvest energy and carbon savings into street lighting asset

The exemption criteria include:

i. Lights at major junctions/ roundabouts
ii. In town centres where there is CCTV, high security businesses like banks, and/or lots of people at night, for example near nightclubs and train stations, outside community facilities like the British Legion or leisure centres
iii. Areas where street lights are needed to reduce road accidents
iv. Areas where there could be an increase in crime through reduced lighting, like pubs and specific residential areas
v. Remote alleys linking residential streets
vi. Near traffic islands, pedestrian crossings, footbridges, subways or where the council has a specific duty of care
vii. In public car parks
viii. At bus stops
ix. At level crossings, speed humps, traffic light
x. Where there is sheltered housing for the elderly

Street lights eligible for part-night lighting will be converted to this operation via remote monitoring equipment, budget allowing. The equipment upgrade should include dimmable ballast, where available, such that the street lights can additionally be dimmed in addition to part-night operation or dimmed even if exempt from part-night operation due to the audit. Remote monitoring is covered in the next section. The council's current generic dimming regime is summarised below.

i. Street lights operate at full design power from dusk (note: the design power may be less than the full output capability of the lantern)
ii. Street lights operate at 80% of full design power between 22:00-24:00
iii. Street lights operate at 60% of full design power between 24:00-5:30, where part night lighting is not appropriate
iv. Street lights operate at 80% of full design power from 6:30 until dusk

1.5 Remote Monitoring

The street lighting service switches and dims its asset using a Central Management System (CMS). This allows remote operation and monitoring of the street lights via radio signals and offers the following advantages in terms of energy savings and service delivery:

i. Reduced energy use and carbon generation through part-night operation and/or dimming
ii. Precise dimming and switching with the ability to easily over-ride part-night operation and to switch to full power output in the case of an emergency or any long-term changes to road layout or useMore efficient repairs and customer service through remote fault reportingFurther reduction in energy bill due to accurate metering of power consumption and switching/dimming times.
iii. Reduced need to undertake night-time fault scouting

Refer to the Highway Design Guide Street Lighting Specification for details of this equipment.

1.6 De-illumination

In some cases street lighting may be considered by the council as unnecessary on new developments or suitable for removalin existing settings. The following criteria form part of this decision.

i. Roads where it can be demonstrated that the lighting no longer serves a purpose,
   i.e. a road to a public facility that is closed
ii. Roads with little or no adjacent properties
iii. Roads without public footway amenity and public transport
iv. Roads where levels of traffic have substantially reduced, i.e. by the installation of a by-pass route
v. Single lighting point installed for a social need, i.e. telephone box, that is no longer required
vi. Private lighting installed on a private property which the council maintains by default or for historic reasons

Consultation with local residents and adjacent property owners should be undertaken, if deemed appropriate. Where consultation is not appropriate, demonstration that there are no major reasons for retaining the street lighting system through comparison with other similar unlit roads shall be considered. Full road safety audits must also be completed as well as consultation with the local police with regard to crime.

Traffic signs and illuminated bollards which the Department for Transport (DfT) allows to be de-illuminated will be completed when budgets are available. With new schemes, the use of Intelligent Road Studs (IRS) and upgrading of the white lines and signing may be considered as an alternative to road lighting on traffic routes, esp. in rural locations where there is little or no pedestrian or cyclist use.

1.7 Risk Management

To identify the health and safety risks associated with the collapse of street lighting columns, the service uses the following assessment criteria, based on The Institute of Lighting Engineers (ILE) recommendations.

Table X – Street Lighting Column Risk Assessment

COLUMN CONDITION		> 40 Years	25-40 Years	< 25 Years
INJURY IMPACT	7-10	Risk of Column Collapse: High - ILE recommendation Replace Columns	Risk of Column Collapse: Medium - ILE recommendation Visual Inspections + Sample Column testing and replace columns that fail	Risk of Column Collapse: Low – ILE recommendation Visual Inspections

The council undertakes structural testing of a sample of the columns in the 25-40 year bracket and uses this information to mitigate against the risk of column collapse, plan column replacements and prioritise future testing programs. The DFT recommend the use of passive safety street lighting columns in areas with speed limits of greater than 50mph. If budget restrictions cannot accommodate this recommendation, a risk assessment will be carried out to determine a suitable alternative.

2. Equipment Maintenance

2.1 Fault Reports and Inspections

The public are encouraged to report faults and defects with streetlights, illuminated traffic signs and bollards using the on-line facility available through the Council's website. They are also able to report issues to the Customer Services team by telephone, e-mail, the Council's social media channels, in writing or in person at the Council Offices during normal opening hours.

The majority of the council's lighting stock is now operated through a Central Management System (CMS) which monitors for faults and highlights any detectable issues.

Night-time inspections will be undertaken on an in-frequent basis for the small number of any remaining non-CMS equipped units.

Physical defects of lighting units shall be checked for during routine Highway Inspections and during planned routine maintenance operations such as bulk cleaning, electrical testing and structural testing.

Instructions for repair of any faults reported or detected will be issued to the Council's street lighting contractor for investigation within 28 days and remedy as necessary.

2.2 Routine Maintenance

Routine maintenance of the street lighting asset includes the following works:

i. Electrical insulation and earth impedance safety testing shall be undertaken in accordance with current Institution of Electrical Engineers (IEE) recommendations (typically once every 6 years)
ii. Street lighting lanterns, column base compartments and electrical feeder pillars shall be cleaned once every 3 years or as otherwise recommended by the manufacturer and/or appropriate technical guidance taking into account localised pollution and road use
iii. Illuminated road signs and traffic bollards or traffic bollards deemed “lit” through reflectivity in accordance with Department for Transport (DfT) requirements, shall have the lanterns/luminaires, sign faces and bollard shells “bulk” cleaned on an annual basis or more frequently where deemed appropriate taking into account localised pollution and road use
iv. Routine replacement of LED arrays, lamps, ballasts or drivers shall be undertaken in accordance with manufacturer and/or appropriate technical guidance
v.

All street lighting columns, illuminated signs, and illuminated and non-illuminated bollards will be cleaned every year, budget permitting. Where manufacturer guarantees exceed this period or with new technologies, such as LED lamps or lamps which are controlled by remote monitoring, these will be changed as required. iii. Full electrical to be undertaken every six years.

iv. Sample structural condition testing of of steel lighting columns and appropriate illuminated sign posts will be undertaken as described in section 1.7 (Risk Management) above using ultra-sound or other similar non-destructive test methods. The frequency will be determined based on column type/material, age, location, risk, manufacturer and/or appropriate technical guidance and recommendations of previous test results.If any columns are found to be showing significant signs of corrosion then tests of

neighbouring columns or other columns of similar model and manufacture date may be deemed appropriate for additional testing based on risk and budget factors.

During all routine maintenance functions a basic visual examination of the unit shall be undertaken and any defects found shall be noted and considered for further inspection of remedial works as appropriate. Where possible and resources, materials, skills and budget permits the defect shall be addressed at the time of the routine inspection.

The above routine maintenance operations shall be undertaken as “bulk” routines where possible (i.e. multiple units in a road or area) to minimise road disruption and keep costs to a minimum.

3. Inventory Maintenance

All council street lighting, illuminated road signs, traffic bollards or traffic bollards deemed “lit” through reflectivity in accordance with DfT requirements, council owned electrical supply cables, feeder pillars and similar or associated equipment will be recorded in a computer-based inventory of all units. This system will include:

i. Mapping facilities for location of equipment
ii. Enable the annual assessment of the energy charge
iii. Fault repair and maintenance history
iv. Asset details, i.e. equipment type, ownership, etc.
v. Asset history, i.e. installation dates, electrical and structural testing dates
vi. Local situation, i.e. road type, storage type
vii. Contract schedule of rates
viii. Budget cost centres

Comments relating to identified safety hazard and risk issuesNRSWA noticing
The council may also hold records of similar equipment owned by 3rd parties (e.g. Parish & Town council’s) for identification where this is believed to be of benefit to highway operations. The 3rd party information will not be definitive and will not infer on the Council any maintenance responsibility for such equipment.

Details of maintenance history and copies of electrical and structural test certificates shall be retained by the council for periods deemed appropriate through public liability recommendations.

4. Electrical Network and Energy Management

4.1 Power Supply Faults

The majority of the Council’s highway electrical equipment is directly powered from cables owned by the local Distribution Network Operator (DNO) or in some cases an Independent Distribution Network Operator (IDNO). Faults on these cables and termination cut-outs are the responsibility of the DNO or IDNO to repair. As set by OFGEM, their performance targets are:

i. Emergency fault response - 2 hours
ii. High priority fault repair (traffic light controlled) - 2 calendar days
iii. High priority fault repair (non-traffic light controlled) - 10 working days
iv. Multiple unit fault repair - 20 working days
v. Single unit fault repair - 25 working days

Where faults occur on “private” cable network owned by the Council then the council shall arrange for repairs or replacement of the cable as necessary in a timescale appropriate to the number of lights affected, the location, road use, risk and subject to Streetworks permissions and permit requirements taking into account the disruption to the highway the works will cause.

4.2 Energy procurement

Energy provision for highway electrical equipment will be procured as and when necessary by the Council's Energy Officer through a suitable energy supplier. As part of requirements for purchase of "un-metered" energy the street lighting service will work with a suitable appointed "Meter Administrator" to manage the input of daily readings from the CMS system into the energy suppliers consumption calculations. The street lighting service will maintain record details of all electrical equipment, including electrical test certificates, the connected load, and associated Elexon Unmetered Supplied User Group (UMSUG) power consumption codes and operating regime codes. Inventory details will be submitted to the electricity supplier in the required format at a frequency agreed with the current supplier (typically this is monthly).