

HEA

Highway Electrical Association

ILP
INSTITUTION OF
LIGHTING
PROFESSIONALS



**Guide to the
Intelligent Lifetime Management of
Public Lighting Life Safety
Engineering Systems
Executive Summary and
Checklist Only**

March 2013

HEA - Intelligent Mgt Public Lighting LSES – Executive Summary and Checklist Only

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1. Introduction

Public Lighting, as a Life Safety Engineering System (LSES) – and in particular Street Lighting - has gathered unprecedented media and public attention in recent years. The reasons for this are the increasing cost of energy, the pressure being put on local authorities to reduce budgets, and legislation in the form of the carbon reduction commitment energy efficiency scheme which encourages energy users to reduce their carbon consumption through the requirement to purchase carbon credits based upon their consumption. All public lighting will fall under the CRCEE from April 2014 when the cost will be £16 per tonne of CO₂ consumed. Local authority asset owners have reacted in different ways to mitigate increases in electricity costs and the carbon reduction commitment obligations.

The Highway Electrical Association has carried out extensive research into the activities of local authorities to reduce their carbon footprint and minimise the electrical energy consumption for street lighting and related highway electrical assets.

Road Lighting thinking and technology has advanced in recent years and there are many methods and means available to provide intelligent management of the lighting asset to optimise the energy consumed and to achieve the right light level on the task at each time period from dusk to dawn. The point being that the task and the many variables that contribute to the selection of the lighting class can vary through the night, so intelligent management of the lighting can allow the light levels to be varied according to the task at different times between dawn and dusk.

In rural areas – there may be an argument for switching off lighting – however this should not be based purely on crime statistics, as the effects of the fear of crime can be pernicious, particularly with an ageing population and can make residents “prisoners in their own homes”. It is important to remember that lighting is primarily for safety and wellbeing, and there are other energy efficient options.

The technology exists now (& has been installed in many parts of the UK) to vary lighting to a defined (using EN 13201 and BS5489) level, subject to pedestrian and traffic flows –whilst still retaining a degree of comfort for residents and the travelling public.

There is now little excuse or cost benefit for imposing the arbitrary switching off of street lighting unless this is something the residents actually desire (having been informed of all the practical alternatives) and the process and decisions reached are based on sound engineering judgement from competent lighting practitioners.

In many areas, including urban areas, there is little appetite for switching off lighting and here there is more scope for profiling the lighting requirements through the night to achieve an intelligently managed solution which responds to the varying needs of the populace at different times of the night in the most energy efficient way.

This guidance document provides information for decision makers, budget holders and lighting practitioners to help them plan their lighting policy for an efficient and sustainable future. It also provides guidance to lighting practitioners on the various options available to them and provides a summary of what different lighting authorities are doing throughout the UK.

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2. Executive Summary

The Highway Electrical Association (HEA) has undertaken a comprehensive review of the actions that Local Authorities have taken and are planning to take to reduce the carbon footprint of their lighting and to improve its energy efficiency. The review summarises the state of play across the UK and provides straightforward guidance for an appropriate response in this area, supported by technical information for the relevant lighting engineers.

The Benefits of Public Lighting

The benefits of lighting can be summarised as follows:

- ✓ Reducing night time accidents (typically up to 30%, with the cost of a road traffic fatality being £1,653,687, serious accident being £185,831 – source DfT)
- ✓ Reducing street crime
- ✓ Reducing fear of crime
- ✓ Facilitating social inclusion, including lifelong learning by facilitating the use of the infrastructure and facilities after dark
- ✓ Promoting local businesses and tourism by facilitating traffic and pedestrian movement and encouraging the viewing of buildings and areas of interest at night
- ✓ Promoting sustainable transport (walking, cycling, public transport)
- ✓ Promoting physical fitness (by encouraging walking and cycling)
- ✓ Allowing the effective use of CCTV systems at night
- ✓ Assisting the emergency services to carry out their duties more easily after dark
- ✓ Facilitating the use of the road infrastructure for longer for travel and commercial transport and distribution
- ✓ Maintaining or improving the quality of life and well being

The Approach

When looking to manage energy consumption, the approach should include the following steps (see also the Checklist for Local Authorities / Public Lighting Asset Owners):

1. The local authority / asset owner should establish a lighting policy, reviewed at regular intervals or on changes of relevant legislation or guidance
2. The local authority / asset owner should carry out a detailed risk analysis (including a pedestrian and traffic safety analysis) of lighting provision and particular areas of concern (e.g. hospitals, schools used after dark, areas prone to accidents).

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3. The local authority / asset owner should then determine what can be done with the existing lighting – e.g. Do Nothing (leave as is), Change light sources and luminaires, modify switch on and switch off times, Dim, apply variable adaptive lighting switch off in whole or in part for the night.

4. The local authority / asset owner should first inform, and then consult – preferably using positive responses, particularly when considering switching off of lighting - with relevant stakeholders, including residents (Consultation, without prior information setting out the available options in a form likely to be understood by the “lay person”, is meaningless and can easily lead to an inappropriate solution).

The Options

Within the documented local authority or other asset owner Lighting Policy, the available options should be listed, with those preferred or chosen and the rationale for this. Available options include:

1. Removing lighting from those signs or bollards where it is not required and this is permitted under the TSRGD
2. Removing or switching off lighting where consultation, after appropriate information has been made available, indicates positively that this is the wish of all affected stakeholders - and confirming this after regular reviews (recommended annual reviews over a three year period).
3. Replacing existing light sources and / or control gear with more efficient light sources / control gear
4. “Trimming” – replacing existing photocells with ones where the light level at which they switch on, taking into account the length of time the light source takes to run up to full designed brightness – and where the level at which they switch off is appropriate
5. Part Night Lighting - where the lighting is switched off part way through the night when the lighting requirement is reduced in terms of traffic flow (pedestrian or vehicular). This would typically be from midnight to 5 or 6am.
6. Dimming – adjusting the level of lighting to suit the usage of the road or area at specific times through the night, either through electronic dimming ballasts or through computerised central management systems
7. Variable lighting / Lighting Profiling / Adaptive Lighting – implementing central management systems enabling compensation to account for light sources being brighter at the start of their life – which depreciates over time, varying the output of light sources to suit the usage based on the required parameters such as traffic volume or pedestrian flow, enabling the appropriate lighting class to be chosen for the traffic flow at that time.

Funding

There are a number of “Invest to save” options and some authorities have reversed earlier decisions to implement part night lighting following coroners reports, resident pressure or simply by getting a better understanding of the benefits of the investment in new technology which most often make that the favoured option with relatively short pay back periods.

There are numerous funding options available to local authorities for invest to save schemes including self-funding through capital and revenue budgets, Prudential Borrowing, Salix funding, PPP and other government and privately funded schemes.

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Checklist for Local Authorities / Public Lighting Asset Owners

Item	Comment	Y / N
Do you have a written Public Lighting Policy?	Informed by a competent lighting practitioner and in terms understood by other stakeholders	
Is it current (i.e. has this been reviewed in the last two years or on change of relevant legislation / standards?)	BS5489 has been revised and re-issued in 2013 and therefore lighting policies need to take this into account	
Does the lighting policy set out the lighting classes for each road, footpath or other public place in accordance with EN13201 and BS5489?		
Are the lighting levels set for each road and do they take account of variations in use through the night?		
Are the lighting levels set appropriate for the use at the time designed and in accordance with EN13201 and BS5489		
Has the policy been approved by the local authority Council / public lighting asset owner board?	This is to ensure senior management buy in	
Are you receiving technical public lighting advice from a competent person(s)?		
Does the competent person(s) have evidence of competence and underpinning knowledge through : 1. A C.V.? 2. Relevant certificated qualifications ? 3. Ongoing records of Continuing Professional Development (CPD) to ensure competence is maintained and up to date?		
When considering changes to the policy to manage public lighting (e.g. switch off times and levels), has a documented risk assessment covering all the available options and areas been carried out?		
When considering changes to manage public lighting, have the relevant other costs been taken into account (e.g. ensuring the electrical and structural safety of any columns, other road safety measures such as the use of different road studs, retroreflective signs, signs informing the travelling public that the lighting has been switched off)	The Health and Safety at Work Act, the Electricity at Work Regulations and the Electricity Safety, Quality and Continuity Regulations together with common law duties apply	
When consulting on proposed changes, do the consultees include the residents (especially shift workers), those using facilities in the area, the police and other stakeholders?		
When consulting on proposed changes, have the consultees been informed in advance, including all the available options, in easy to understand language?		
Have the consultees given the local authority a mandate to change based on a positive vote (particularly for switching off)?		
Are the changes, once implemented, being reviewed annually over a total three year period (to align with accident / safety studies which uses the same period) before confirming the change?	The total review period is important, particularly when considering total or partial switch off, or changes in light sources to enable statistically valid figures to be obtained	

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