

# Street Lighting Strategy

## 2015-16



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## **Introduction**

Street lighting forms a highly visible and vital part of the street scene. Lighting is provided to enable safe use of the highway for road user's, cyclists and pedestrians and also promotes strong and safe communities.

Lighting can also be a key element in successful regeneration projects and new developments and can provide an area with strong visual identity.

However, street lighting also consumes a great deal of energy and therefore contributes to carbon emissions. Street lighting is also a contributor to light pollution.

The strategy builds on the work carried out to improve our street lighting stock and service since the introduction of the PFI (Private Finance Initiative) contract in 2007. It has been developed following the principles laid out in the original Project Agreement, but also takes into account experience gained through the introduction of new street lighting technologies.

Within this strategy, the term 'street lighting' encompasses lighting and all other items of illuminated street furniture provided on the public highway and within other open space areas owned or managed by the Council.

## **1.0 Legislative Powers**

Derby City Council is not required in law to provide street lighting, however, under the Highways Act 1980, Section 97 –

*(1) ..... "every local highway authority may provide lighting for the purposes of any highway or proposed highway for which they are or will be the highway authority, and may for that purpose –*

*(a) Contract with any persons for the supply of gas, electricity or other means of lighting; and*

*(b) Construct and maintain such lamps, posts and other works as they consider necessary"*

Derby City Council and its appointed street lighting service provider is required to maintain any street lighting it does provide in a safe condition.

## **2.0 Background**

In 2007, Derby City Council went in to partnership with Balfour Beatty under the PFI brand name of lightingderby. At the time, many of the Council's street lighting columns had reached the end of their design life and were becoming a significant risk of failure. The Council did not have the capital or revenue funds to address or match the investment needs that private sector investment provided.

On behalf of the Council, its partner Balfour Beatty, Lightingderby operates and manages 32,083 street lighting assets. Of those, 29,034 are made up of street lights, a further 1,640 traffic signs and 997 bollards in the city.

As part of the PFI a five year replacement programme took place whereby, over 20,000 columns, signs and bollards have been replaced between 2007 and 2012, with a further 2,075 assets to be replaced in 2022.

Based on their age prior to the start of the PFI contract, around 5,870 assets will remain unchanged and will not require replacing.

### 3.0 Scope of the PFI Project

The scope of the project is for the provision of street lighting services over a 25 year period from 2007 until 2032. This also involves the design, installation, operation and maintenance of all new street lighting assets.

<b>PROJECT INCLUDES:</b>	<b>PROJECT EXCLUDES:</b>
Street Lighting	Illuminated street advertising signs
High mast lighting	Variable Message Signs
Lighting of parks and green space areas	CCTV and video surveillance equipment
Illuminated traffic signs and bollards	Traffic Signals
Non-illuminated traffic bollards	Illuminated bus shelters
Subway lighting	Non-illuminated signs
Under-bridge lighting	Floodlighting at sports/recreation areas
School Crossing Patrol Warning Lights	Floodlighting to monuments and buildings
Private Cable Installations	Multi Storey and surface car parks
	Speed camera installations
	Festive lighting

## **4.0 Aims and objectives of the PFI Project**

**4.1** The Project aims to deliver significant improvements to the lighting infrastructure in Derby;

- Improve lighting levels
- Improved road safety
- Crime reduction
- Maximum energy efficiency
- Improved maintenance standards

**4.2** The key strategic aims of the project are:

- To secure and maintain the most efficient, effective and appropriate public lighting on the highway and green space areas
- To improve road safety for drivers, vehicles, cyclists and pedestrians
- To reduce street crime and the fear of crime
- To enhance the local environment and enable communities and business to develop and flourish in a sustainable manner
- To reduce the adverse effect of the lighting infrastructure on the environment

## **5.0 The Derby Plan**

The Derby Plan aims to improve the quality of life for everyone in Derby both now and for future generations<sup>1</sup>. Street lighting contributes significantly to the following aims:

- Thriving sustainable economy
- Good health and well being
- Being safe and feeling safe
- A strong community
- An active cultural life.

A number of outcomes are identified which are thought to be key to delivering these aims, including 'Less carbon emissions from industry and transport'. Reducing carbon emissions is therefore a key part of Derby's vision for the future, and the street lighting strategy aims to address this.

## **6.0 The Local Transport Plan**

The Local Transport Plan (LTP3) sets out our strategies, targets and spending programmes for transport provision in Derby over the next 15 years from April 2011 to March 2026.

During this period we will make best use of, and maintain the transport assets we have, and support low cost and low carbon alternatives to the car, such as walking, cycling and public transport.

Improving health and quality of life for everyone who lives, works and visits Derby is also important, working to improve safety, air quality and improving the overall experience and satisfaction of the city's transport services.

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<sup>1</sup> Derby City Partnership – The Derby Plan 2011 – 2026 A Vision for Derby's future: 2011

Street lighting is an integral part of LTP3 with appropriate, well maintained lighting impacting on many of the aims and objectives, which are underpinned by the five key national transport goals<sup>2</sup> to:

- **support** national **economic** competitiveness and **growth**, by delivering reliable and efficient transport networks
- **reduce** transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of **tackling climate change**
- **contribute to better safety, security and health** and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health
- **promote** greater **equality of opportunity** for all citizens, with the desired outcome of achieving a fairer society
- **improve** quality of life for transport users and non-transport users, and to promote a **healthy natural environment**.

## 7.0 Derby City Council Asset Management Policy and Strategy

Asset management is about understanding the condition of assets and the planning for where and when future investment is needed. Lifecycle Planning through the introduction of the PFI contract allows the accurate recording and the condition status of all street lighting assets which includes a valuation prepared against CIPFA guidelines.

Derby City Council is committed to demonstrating to DfT that we have embedded the principles of asset management in our working practices. This strategy should be read in conjunction with the council's Highway Asset Management Policy & Strategy<sup>3</sup>

## 8.0 Reasons for road lighting

Road lighting encompasses the lighting of all types of highway, public maintainable streets and roads, assisting traffic safety and ease of passage for all users. Good lighting can be one of the measures used to reduce night-time traffic collisions. It can allow pedestrians to see hazards, orientate themselves, recognise other pedestrians and feel more secure. It also has a wider social role, with the potential of helping to reduce crime and the fear of crime, and can contribute to commercial and social use at night of city centres and tourist locations by improving both the daytime and night-time appearance.

## 9.0 Basic needs

Lighting equipment should be suitable for fulfilling the lighting needs in strategic, residential, and public amenity areas. The first consideration is the ability to illuminate the area in the most effective manner possible. Secondly, the appearance of the lighting equipment should be aesthetically pleasing; style shape and choice of materials play an important part and should be chosen to compliment and work in harmony with its surroundings. At all times, and

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<sup>2</sup> Derby Local Transport Plan, LTP3 2011-2026 – Part 1 Strategy

<sup>3</sup> For further information please refer to [www.derby.gov.uk](http://www.derby.gov.uk) Highway Asset Management Policy & Strategy 2014-15

especially at night, it should add to the attraction of the street scene rather than detracting from it.

## 10.0 Drivers for Change

The street lighting industry has gone through significant changes over a relatively short period of time and many local authorities have had relatively little time to adjust. Therefore, street lighting is high on the agenda of many local authorities as a potential area for change and making efficiency savings. Those main drivers for change are:

### 10.1 Energy - Lighting accounts for a significant proportion of electrical usage within the built environment and energy costs are forecasted to trend upwards in the foreseeable future. The need for a sustainable design and infrastructure is also relevant.

It is important to light streets for the safety of highway users and for community safety, however most street are lit all night irrespective of the need. By means of assessment, certain streets are able to have lighting levels reduced for certain periods of the night. This assessment is based on traffic volume, community safety and understanding of local needs, we can then assess whether it is safe and practicable to reduce lighting. This strategy aims to pilot this method across the city.

### 10.2 CO<sub>2</sub> Reduction Measures and Targets – Derby City Council is committed to reducing CO<sub>2</sub> emissions by 17% by 2020, based on the UK's commitment under the Climate Change Act 2008 which has established a system of five-yearly carbon budgets.<sup>4</sup>

Government figures have shown that in Derby, city-wide carbon emission have fallen by 14% (based on 2005-2011 figures). Street lighting is a major contributor for Derby City Council to these figures as it accounts for 12% of the Council's own contribution for electricity.

We currently use a great deal of electricity to light our streets, some of which is not as efficient as it could be, therefore needlessly increasing our carbon footprint. We will enforce the development and management of appropriate energy-efficient designs to minimise energy use and carbon emissions (CO<sub>2</sub>).

### 10.3 Climate Change - Internationally, climate change has been recognised as the greatest long-term environmental threat, posing far reaching impacts upon our lives, health and well-being, our economy and natural environment.

The UK is committed under the Climate Change Act 2008 to an 80% emissions reduction by 2050.

Derby City Council is committed to challenging climate change and has published a series of priority themes<sup>5</sup>.

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<sup>4</sup> For further information on carbon budgets visit: <https://www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050/supporting-pages/carbon-budgets>.

<sup>5</sup> Derby's Climate Change Strategy

The choice of transport has a significant impact on carbon emissions. Derby's street lighting infrastructure supports access to both pedestrian and cycle routes for smarter travel which looks at more sustainable options throughout the city that are accessible, safe and easy for communities and local businesses to use.

We will continue to promote lighting of sustainable modes of travel.

**10.4 Environmental Awareness** - The environmental impact of street lighting is due to a number of separate but interrelated problems. The three main environmental impacts are light pollution, daytime appearance and energy consumption. Each of these issues can best be minimised by careful design of the lighting installation to achieve the required lighting levels without overprovision.

The use of lanterns with good optical control will maximise the spacing needed for a lighting scheme, reducing the number installed and minimising energy consumed. A reduction in the number of units installed will help to reduce light intrusion in to properties and light pollution.

The Service Provider will only use optics with clear bowls to increase the control of the light and reduce light scatter. In selecting the lanterns and optical performance for residential streets, the Service Provider has considered the reduction of light intrusion with an option to fit further equipment to reduce light intrusion into adjacent properties if required.

The PFI contract contains specific references to environmental considerations and specifies that the contractor must work within the requirements of the Environmental Protection Act 1990, and Sections 102 to 103 of the Clean Neighbourhood and Environment Act 2005

Specific references to environmental considerations are contained in the contract for planned maintenance requirements, and the monthly Service Report contains a section on environmental considerations such as energy efficiency, obtrusive lighting, waste products and enhancements.

**10.5 Economic and Financial pressures** – There are increasing pressures on local authorities to make savings in energy consumption and service costs. Unmetered energy costs have increased by more than 60% between 2007 and 2014. Reduced energy consumption also means reduced energy bills which will save the Council money for the lifetime of the installed street lighting infrastructure.

**10.6 Changes in technology** - As part of our street lighting strategy, new technology and products are evaluated and wherever possible we actively look to reduce the environmental impact of street lighting by piloting and adopting new methods. Advances in modern lamp technology and electronic programmable control gear, coupled with the lower and variable lighting levels permissible by the revised British Standards (BS 5489) and EN 13201, means that it is now feasible to reduce the burden of energy by tailoring the lighting to specific locations; **the right light in the right place at the right time.**

## **11.0 Supply of Energy**

Power for lighting is mainly provided by electricity that is generated at off-peak times, when power production is at its lowest.



Our aim is to ensure that the amount of energy used is no more than is needed. Our own energy costs have increased by 60% since 2007 and are predicted to further increase by 50% over the next 10 years.

All the lighting apparatus requires energy to operate and this is purchased corporately through ESPO, a public sector procurement framework. The ESPO framework offers a competitive route to the supply of electricity. Working with them ensures that optimum value is obtained for cost against environmental issues. By procuring energy by this method we will:

- Ensure that we have an accurate inventory of apparatus in accordance with BSCP520
- Meet the requirements of our Unmetered Connection Agreement with the Regional Electricity Company

Under the terms and conditions of the connection agreement with the Regional Electricity Company, we are responsible for the payment for all energy taken from any item of street lighting apparatus owned and operated by the organisation and our service provider.

## 12.0 Variable lighting levels

Improved technology has allowed a more flexible approach in the variation of lighting levels across all different class of road dependent upon its use at any given time. As the usage is reduced then so too the lighting levels unless there are over-riding reasons not to do so (such as a high road traffic collisions or crime rate).

There are additional environmental benefits of using variable lighting levels, including reduced light intrusion, light pollution, energy consumption and carbon emission and these options are being and will continued to be considered, on their own merit, on all future street lighting installations.

Energy efficient measures will be based on the overall electrical load required to light Derby based upon the lighting classes as defined by European and British Standards.

Good lighting can contribute to energy and carbon (CO<sub>2</sub>) reduction and should be the forefront of any energy and carbon reduction strategy developments. There are various options available to Derby, each of which will have been carefully assessed, including:

- **Variable Lighting** – The amount of road lighting is based on usage. When the use of a road is reduced through the hours of darkness, for example, between 22:00hrs and 06:00hrs, and providing the equipment is suitable, the lighting levels can be reduced through dimming.
- **Trimming** – can be applied to switch on and switch off at a specific ambient lighting level via the use of a photo electric cell, reducing the operating hours.
- **Part-night** – Again, based on usage, the lighting is turned off between certain hours such as 22:00hrs and 06:00hrs

This has already been trialled in public amenity areas and footpaths and has been introduced at the request of local Neighbourhood Boards in order to keep energy costs to a minimum.

## 13.0 Street Lighting Design

It is the responsibility of Derby City Council to deliver a structured and clearly defined approach to the provision of lighting. We have to determine and deliver the correct level of lighting for each specific class of road, street, footpath and cycle track.

When considering any street lighting scheme the impact on the natural environment should be taken into account to reduce light pollution.

Design standards used in the provision of new and replacement street lighting should be in accordance with the requirements of the latest versions of the documents listed below:

- British Standards (BS 5489-1)
- European Standard (EN 13201)
- Institute of Lighting Professionals (ILP) Technical Reports
- IEE Wiring Regulations
- Derby City Council's Street Lighting Specification for Private Developers

## 14.0 New Developments

***“Derby is a growing city of almost 250,000 people and around 105,000 homes.<sup>6</sup>In the last 30 years, Derby’s population has increased by around 12%, compared to a national increase of around 10%”<sup>7</sup>.*** With this come stronger economic growth, employment growth and real estate development.

Street lighting will be provided by the Developer on all new residential and commercial developments and adopted by the Authority under the terms of Section 38 or Section 278 of the Highways Act 1980, or Section 106 of the Planning and Countryside Act 1990.

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

Consideration is taken in respect of any existing lighting, conservation areas and general location. Such developments will result in future energy and maintenance costs for lighting being passed on to the Authority. The lighting requirements will be assessed based on the criteria laid out in Derby City Council's Street Lighting Specification for Private Developers, and advice will be provided to the developer, and planning and highway development control officers on the lighting classes required to ensure consistency is delivered citywide.

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<sup>6</sup> Extract taken from Derby City Local Plan – Part 1 Draft Core Strategy

<sup>7</sup> Extract taken from Derby's Economic Strategy 2011 -2016

## 14.1 Environmental Zones

All lighting designs should be completed in accordance with the environmental zone obtrusive lighting limitations to primarily reduce light pollution. These zones have been developed and defined by the Institute of Lighting Professionals 'Guidance Notes for the Reduction of Obtrusive Light'<sup>8</sup>. For the purpose of this strategy; the City Centre shall be classed as:

- E4 - areas of high district brightness (urban centres with high night-time use)

the remainder of the City is classed as:

- E3 - areas of medium brightness (urban locations)

## 14.2 Sustainability

Through innovative and considered decision-making, sustainability can be achieved with additional investment to upgrade the existing stock and also at the design and construction stage of new lighting schemes where consideration is given to the operational costs over its lifetime.

Along with new technology and solutions such as energy efficient light sources and control methods, simple practices such as selection of the correct lighting class and the use of variable lighting can help to make lighting more sustainable; *'Right light, right place, right time'*.

The environmental impact of lighting can be reduced by varying the lighting levels to allow the appropriate lighting level at the relevant time. Also consideration should be made to minimise energy usage and reduce carbon emissions. We will do this by:

- Introducing of new technology including Light Emitting Diodes (LEDS)
- Ensuring all new lighting schemes are not over lit
- Introducing part night switching/dimming via a Central Management System (CMS), or other methods, where appropriate.

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<sup>8</sup> For further information and specific definitions to please refer to the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011

## **15.0 Equipment Specification**

All street lighting equipment installed must comply with the requirements of the street lighting policy and the design standards detailed in this document. Standardising street lighting equipment will ease future maintenance liabilities and keep replacement stock to a minimum.

The environmental impact from future maintenance activities and whole life costing will be taken into account, ensuring that all future street lighting installations are sustainable in the long term.

### **15.1 Lighting Columns**

All new lighting columns will comply with the requirements of the latest British Standards (BS EN 40 parts 1, 2 and 3) and will be of a type, height and spacing to ensure that the required lighting level is achieved.

All columns will be offered with a design life of 50 years.

Approximately 20% of our existing lighting stock is over 8 metres. They will comply with the fatigue requirements of BD 94/07, as directed in the Design Manual for Roads and Bridges Volume 2, Section 2 Part 1, Design of Minor Structures: 2007.

Those requirements include:

- Compliance to British Standards BS EN 40, Lighting columns. Design and Verification. Verification by Testing: 2013.

In order to extend and guarantee the life of each column, Derby City opted for a thermoplastic protective coating which prevents the ingress of water and possible corrosion and the need for repainting. The standard colour chosen is raven grey (as defined in the British Standards colour chart BS 4800 colour code 18B29). Some areas may have a locally adopted colour for street lighting, such as conservations areas, regeneration projects and public realm, and therefore the columns may require a different colour. This will be agreed with Derby City Council prior to installation.

### **15.2 Lanterns**

Lanterns will be of a high Ingress Protection (IP) rating and of a modular construction to provide a future proof structure for installing the latest technical advances.

The design of the optic should allow for a degree of adjustability to ensure the minimum environmental pollution to the night sky, known as 'sky glow' (the amount of upward light from the lantern) will be kept to a minimum.

### **15.3 Control Gear**

Electronic control gear is used for lamp wattages up to and including 250w and is standard across the range of luminaires used. The benefit of fitting electronic control gear includes:

- Minimises unproductive consumption of energy
- High power factor to minimise losses
- Increased lamp life
- Improved Lumen maintenance
- Facility to dim
- Interface with central management systems.

## 16.0 Illuminated Traffic Signs and Bollards Maintenance

Traffic signs provide road users with essential information that they require to use the road network.

There are currently 1,640 traffic signs and 997 bollards in the city, some of which are lit 24 hours a day. Reducing the number of illuminated signs and bollards on the highway can have a positive impact on street clutter and can have cost benefits in terms of reducing energy consumption and CO<sub>2</sub>. In addition, maintenance costs are reduced in locations which, by nature, are often in locations within close proximity to live traffic and therefore require costly traffic management and possible disruption to the network to attend to and repair

We have made provision in the annual highway and transport work programme for a rolling programme of replacement to all illuminated bollards and we have already made a start to this programme by replacing 327 previously lit bollards at a cost of £57,356.16.

All illuminated bollards that are not required to be lit under the Traffic Signs Regulations and General Directions 2002 will be replaced with a passively safe, retro-reflective unlit type. See Fig 1.

Currently all traffic signs in Derby are lit with LED technology. However, this was done when LED's were relatively new to the industry, and although, even today, they demonstrate clear operational savings against conventional fluorescent lamp technology, we envisage at some point a replacement programme will need to take place. At this point we will consider future needs and methods to illuminate our traffic signs and will take advantage of improved technology to reduce energy even further.



The six month cleaning cycle for bollards will generally be adhered to, however, the frequency may be varied to suit local areas of increased pollution such as industrial areas and busy traffic routes and inclement weather. The criteria to be used on the monthly inspection to determine if additional cleaning is required, will be that if the bollard is degraded, damaged, faded or soiled such that colours, symbols or legend are illegible or difficult to decipher by motorists.

Fig 1 Passively Safe Non-illuminated Bollard used in Derby

## 17.0 Performance Standards

Our strategy is to use controls and measures to ensure that quality and performance is correctly monitored by the service provider.

The following performance standards are measured and reported monthly by the Service Provider to Derby City Council. Results of such performance will be published as required.

- PS1 Lighting Installation (During the Core Investment Period)
- PS2 Lighting Performance and Planned Maintenance
- PS3 Operational Responsiveness and Reactive Maintenance
- PS4 Contract Management and Customer Interface
- PS5 Strategic Assistance and Reporting
- PS6 Working Practices

## 18.0 Annual Maintenance Programme

Derby City Council is committed to maintenance in accordance with the principles set out in 'Well-lit Highways – Code of Practice for Highway Lighting Management 2004', the Institution of Lighting Professionals Technical Reports, good industry practice and the scope of the PFI project as detailed in Schedule 4 – Output Specification of the PFI contract.

Regular updates on the maintenance programme are reported on monthly basis by the Service Provider, where we have an opportunity to challenge their processes and practices.

## 19.0 Operational/Cyclic Maintenance

Cyclic maintenance is the main tool in the management of preventative maintenance, reducing the risk of poor performance and failure of any street light.

A robust maintenance programme helps us to prevent the performance of street lighting falling below the designed level and takes into account age and type of equipment and statutory requirements such as electrical testing.

The following targets set out the required levels of performance that the Service Provider must meet in order to avoid any Adjustments under Performance Standard 2 of the contract:

- (a) PS2 Performance Target A – 99% or more Lighting Point(s) shall be In Light during the Lighting Up Periods (Part 3 of the Output Specification)
- (b) PS2 Performance Target B – 90% or more of all new Street Lighting installations shall provide at least 100% of the Designed Light Output during Lighting up Periods.
- (b) PS2 Performance Target C – Apparatus shall be inspected, tested and cleaned in accordance with the minimum frequencies set out in the following table:

	<b>Nature of Characteristic to be inspected and routinely maintained</b>	<b>Minimum Frequency</b>
A	Inspection and testing of mechanical and structural integrity of the Apparatus in accordance with the Relevant Standards	Every Contract Years for Accrued Apparatus  Once in every four (4) Contract Years for PFI installed equipment.
B	Inspection and testing of electrical integrity of the Apparatus in accordance with the Relevant Standards	Once in every six (6) Contract Years in accordance with the British Standards, BS 7671
C	Cleaning of Apparatus (excluding Street Lighting and Off Highway Lighting)	Twice every Contract Year at intervals of six (6) Months throughout the Contract Period in accordance with BS EN 12899 – 1 & 2 Except for Contract Year 26
D	Lamp Change and clean	In accordance with the 'maintenance factor' requirements for New Apparatus and in accordance with established frequencies for Existing Apparatus as referenced in Appendix 8, 9 and 10 in the Output Specification.

Target response times are specified in the contract, with a financial penalty to be imposed if the response times are not met.

## **20.0 Planned Maintenance: Renewals**

As part of the PFI contract, the planned renewal of all columns at or near the end of the design life has been identified for replacement. Additionally, the inspection regime instigated by the contractor as part of the contract is designed to identify areas where columns may need to be brought forward in the programme for renewal.

## **21.0 Reactive Maintenance**

We are committed to attending to faults within 5 working days of the fault being reported. It is always the priority to repair the faults on the first visit, however if specialist parts are needed or the electricity supply is faulty this may not be possible.

On an average month, our Service Provider receives 264 faults through various formats which include, night patrol, through the dedicated website, Derby City Council's Customer Services and members of the public.

To ensure Best Value we will regularly review the street lighting service to determine whether it meets current and future needs and benchmark performance against other Service Providers.

## **22.0 Lighting Performance**

This will be achieved by regular patrolling of every item of equipment by the Service Provider during the hours of darkness, throughout the year. The patrolling frequency will be once per fortnight throughout the year. Due to the shorter nights during the summer months, the Service Provider may wish to amend this frequency with prior approval from the Authority.

## **23.0 Electrical Testing**

Every six years, electrical testing will be carried by our Service Provider in accordance with current and all subsequent revisions of the British Standard BS 7671:2008 Requirements for Electrical Installations, IEE Wiring Regulations Seventeenth Edition, by trained and qualified staff on all illuminated highway apparatus and Private Cable Installations.

Where equipment falls below the required standards, remedial works will be arranged accordingly.

## **24.0 Structural Condition Inspections**

The structural assets in street lighting are the most costly to replace and carry the most risk to highway users if not managed correctly.

All lighting columns and sign posts deteriorate over time and require periodic inspections throughout their usable life prior to replacement. The frequency and type of inspections required will vary according to its age, location, use and the materials of manufacture and will be undertaken in accordance with the recommendations in the Institution of Lighting Professionals (ILP) Technical Report No 22 and any subsequent revisions of the UKRLG Code of Practice and the PFI Contract requirements.

If any column is discovered to be in a structurally unsound condition, it will be treated as an emergency and made safe.

## **25.0 Asset Management System**

Our service provider is responsible for the development and operation of an electronic based inventory system of all street lighting assets. This system allows effective maintenance management of the assets and enables appropriate risk assessment strategies to be formulated and to facilitate the regulation and monitoring of energy consumption for unmetered equipment; this is in accordance with the ILP Technical Report No: 22, "Managing a Vital Asset" and the UK Roads Liaison Group publication, Well Lit Highways.

Without this essential information, we will not be able to monitor current condition, demonstrate current performance or predict future performance. Furthermore, we would not be able to determine the value of the assets for reporting back to central government for Whole of Government Accounting purposes.

Access is provided by the Service Provider to the MIS (Management Information System) for all street lighting assets, allowing Derby City Council to formalise robust systems and procedures for contract monitoring against specific performance targets. This ensures on-going contract payments are controlled and managed in line with audit requirements.



## 26.0 Conservation Areas



In Derby, we have 16 conservation areas and one World Heritage Site. These areas, quite rightly, carry significant public interest and with that come all of the aesthetic features including the appearance of street lighting and their design<sup>9</sup>.

Street lighting installed as part of refurbishment or renewal shall be of similar appearance and equivalent quality, and shall be selected in full consultation with our own Planning and Conservation Officers and local residents groups.

All columns will be painted black, and wherever practical, we will avoid positioning of new columns outside a listed building.

We will also work with English Heritage and the Secretary of State when areas with “scheduled ancient monuments” (SAM) are selected for renewal or refurbishment and will seek the necessary permissions to work on, around or near the SAM<sup>10</sup>.

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<sup>9</sup> You can find further information on our conservation area and World Heritage Site on our webpages, <http://www.derby.gov.uk/environment-and-planning/conservation/conservation-area/> and <http://www.derwentvalleymills.org/>

<sup>10</sup> Scheduled Monuments are nationally-important archaeological sites given legal protection under the Ancient Monuments and Archaeological Areas Act 1979

## 27.0 Flora and Fauna

Exposure to light affects the biochemistry and behaviour of organisms. In plants, the presence of light sensitive chemicals provides the basis for regeneration and growth known as photosynthesis. Introduction of artificial light can have profound consequences on a plants growth and development.

Some mammals, reptiles and insects have a different sensitivity to light than humans, for example they are able to detect ultraviolet light, which is on an electromagnetic wavelength which is outside of the range that the human eye can perceive.

In particular bats have adapted their lifestyle so that they are active in the dark to avoid predators. Artificial light can cause a disturbance to a bats roost, feeding behaviour and the use of their commuting routes.

Changes in several species of birds' behaviours can also be observed. The common evening birdsong can often be heard long after nightfall as birds sing by the light of a nearby street light. Long-term, this could affect the birds' survival and breeding season<sup>11</sup>.

Protection of the natural environment and wildlife habitats is essential in street lighting design and commences with a full site survey on all new installations.

The main principles and design considerations are:

### Do not

- **Provide excessive lighting.** Use only the minimum amount of light needed for the task.
- **Directly illuminate bat roosts** or important areas for nesting birds.

### Avoid

- **Installing lighting in ecological sensitive areas** such as: near ponds, lakes, rivers, area of high conservation value, sites support particularly light-sensitive species of conservation significance (e.g. glow worms, rare moths, slow-flying bats) and habitats used by protected species.
- **Using reflective surfaces under light.**<sup>12</sup>

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<sup>11</sup> Pollard A. (2009) Visual constraints on bird behaviour. University of Cardiff

<sup>12</sup> Bat Conservation Trust (2014) Interim Guidance: Recommendations to help minimise the impact artificial lighting

## 28.0 Service Expectations

Street lighting is regarded by the public as a particularly important service because of the potential impact it can have on mobility and safety.

We are committed to delivering maximum value and to be open, honest and approachable when dealing with the public.

Residents will be kept informed by our Service Provider on the progress of the PFI project through letter drops, local press releases and via a dedicated website<sup>13</sup>.

Customer satisfaction surveys will be carried out every 3 years as part of the PFI Contract by the service provider and reported regularly in Management Reports to the Authority.

Customer complaints are investigated and recorded by the service provider as part of the PFI contract and follows Derby City Councils own guidelines for Customer Services and complaints as prescribed in the Contract<sup>14</sup>.

Additionally the results of a national highway and transport survey conducted in 2014 of 70 participating Authorities<sup>15</sup> showed that overall satisfaction for street lighting placed Derby City first amongst the East Midlands Authorities and in in 3<sup>rd</sup> place overall. One of the key questions in this survey to the public was '**how important do you consider.....**' Almost 90% of those surveyed in Derby said that street lighting is important with 75% of those indicating they are satisfied with the service.

## 29.0 Quality Management

We will ensure that our appointed service provider is accredited to BS EN ISO 9001: 2000.

The design and installation of all work will take place in a formal structure, governed by specific quality procedures and a quality system to ensure a consistent product is delivered, which encompasses best practice and quality.

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<sup>13</sup> For further information please visit [www.lightingderby.com](http://www.lightingderby.com)

<sup>14</sup> Method Statement 8 (Contract management and Customer Interface)

<sup>15</sup> National Highways and Transport Public Satisfaction Survey 2014

### **30.0 Training & Competency of Staff**

All those involved in managing and providing the service will be recruited on the basis of experience, skills and qualifications<sup>16</sup>.

Derby City Council and its service provider are affiliated to a number of professional institutions, including the ILP, IHE, ICE, HEA, and many others bringing expertise, education and information to the authority on a continuing basis. There is an on-going commitment from all parties to further CPD (Continuing Professional Development) in all aspects of contract delivery learning from others, be it membership and attendance to groups such as MSIG (Midlands Service Improvement Group) and the ILP Midlands Region Technical Meetings.

### **31.0 Innovation**

Close partnership working ensures Derby City is well placed to be aware of advancements of new technologies and techniques in the lighting industry that would bring both financial and environmental benefits during the life of the contract.

Consistently high level of recent investment in research and development in the street lighting industry has led to the emergence of new technology and the relatively recent introduction of LED's is seen in the industry as a significant way of improving lighting and reducing energy consumption.

The recent introduction of a £1.4 million 'Invest to Save' Street Lighting Energy Reduction Project to install a Central Management System (CMS) which, can control and adjust the light output on all high energy usage equipment, is just one approach we have made to deliver sustainable financial savings associated with street lighting<sup>17</sup>

It is also our intention to actively pursue funding for the replacement of over 14,000 luminaires in Derby with LED (Light Emitting Diode). LED luminaires have a substantially lower energy usage and are easily programmable to further reduce energy consumption and CO<sub>2</sub>. Where LED luminaires are installed it is not anticipated that they will require replacement for approximately 20 years.

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<sup>16</sup> Specific recommendations for competency related to various disciplines and activities with street lighting are given in Appendix C – Competence of UKRLG Well-lit Highways, Code of Practice for Highway Lighting Management 2004 which is currently under review.

<sup>17</sup> Report to Cabinet dated 11<sup>th</sup> September 2013

<https://democracy.derby.gov.uk/MeetingsCalendar/tabid/73/ctl/ViewMeetingPublic/mid/410/Meeting/7453/Committee/1768/Default.aspx>