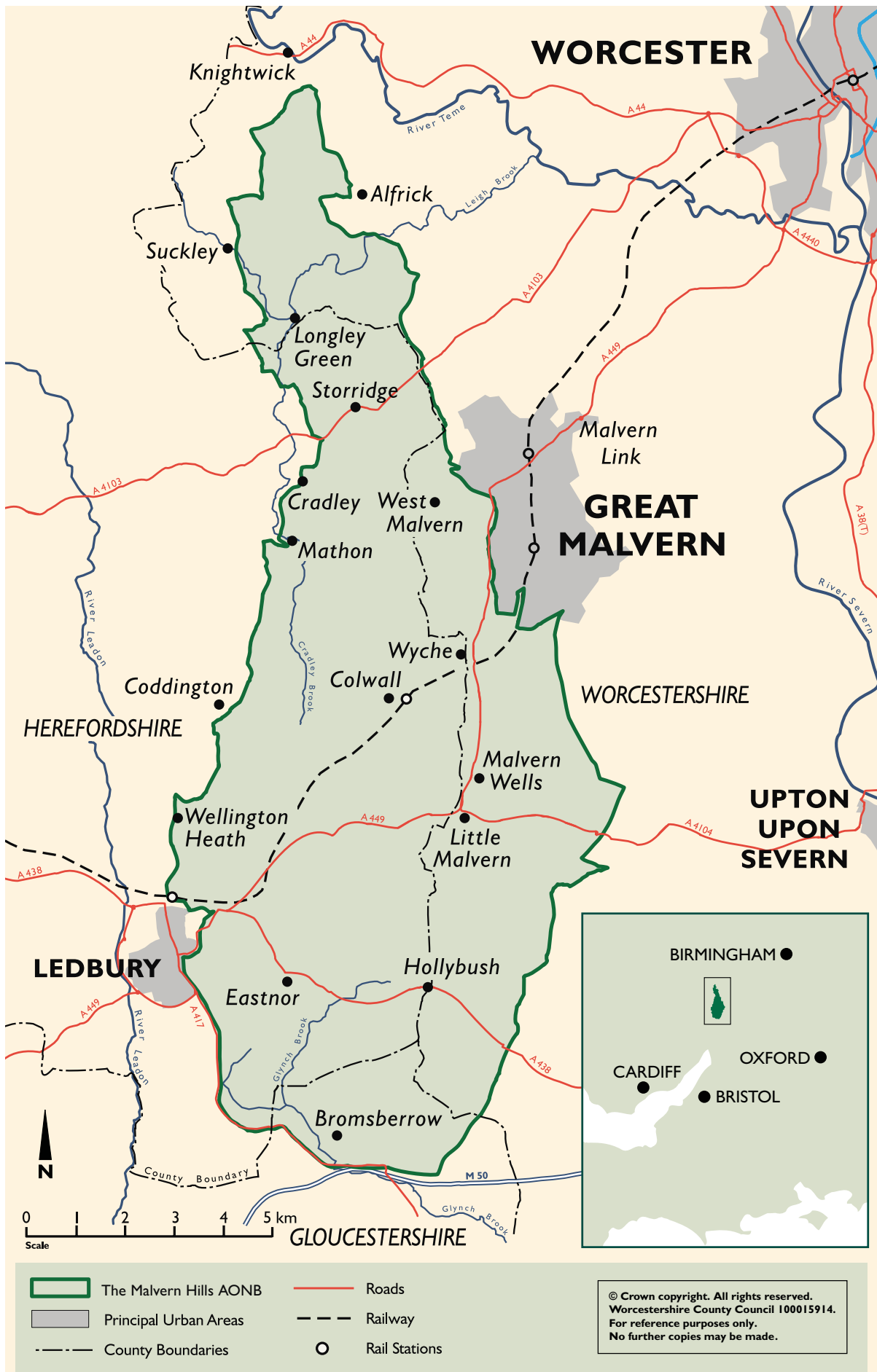


Malvern Hills Area of Outstanding Natural Beauty Guidance on lighting





Outline map of the Malvern Hills AONB

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Restrained, well positioned lighting at a warehouse at Blackmore Park, Malvern

1. Introduction

The Malvern Hills Area of Outstanding Natural Beauty (AONB) is renowned for its landscape and scenic beauty, but it is not just the daytime views which are an attraction. Visitors to the area can also enjoy the beauty of the night sky. With few large towns, and with the Malvern Hills themselves forming a natural light barrier, the AONB offers opportunities to see stars and planets in 'dark skies' which are not visible in brightly lit areas.

However, increased lighting on rural roads, village streets and on houses and other developments reduces our ability to appreciate these dark skies. It also impacts on our experience of the landscape by altering the naturally changing light levels that occur at dusk and before dawn. Furthermore, artificial light can have a subtle, cumulative effect on the character of rural landscapes, since brightly lit skies blur the distinction between urban and rural areas.

1.1 The purpose of this guidance

The purpose of this guidance is to promote good practice in external lighting. Its aim is to reduce light pollution, enabling us to see the stars more clearly whilst also saving energy and minimising the impact of lighting on wildlife, people and on our natural landscapes. The guidance has been produced because tranquillity – which includes dark skies – is one of the special qualities of the area.

In 2019 two Dark Sky Discovery sites within the AONB were approved by the UK Dark Sky Discovery Network. These sites, at Castlemorton and Mathon, have been recognised for the opportunities they offer to observe the night skies and are further proof of the importance of dark skies above the AONB.

1.2 Who this document is for

This document provides guidance for anyone who is using, replacing or installing new external lighting in or around the Malvern Hills AONB; this includes householders, businesses and developers. It is also targeted at those with responsibility for setting the framework for development and for making decisions about individual planning applications; this includes planning staff and their colleagues in local authorities.

Everyone can help reduce light pollution, reduce energy use and save money by improving the type of outdoor lighting they use. There are many simple and cost effective solutions which can reduce the impact of outdoor lighting on the environment whilst still providing a feeling of safety and comfort, by delivering the right amount of light only when and where it is needed.

1.3 The status of this guidance

The Malvern Hills AONB derives much of its beauty from its tranquillity and rural character. In order to help protect these special qualities the AONB Management Plan (2019-2024) contains the following policy:

BDP5: Lighting schemes should be kept to a minimum and only installed where absolutely necessary. Light pollution should be avoided through adherence to good design and practice, for example, dimming or turning light off wherever possible.

This guidance document has been produced to help implement this policy and to help deliver the Malvern Hills AONB Management Plan which 'formulates local authority policy for the management of the AONB and for the carrying out of their functions in relation to it' (Section 89 of the Countryside and Rights of Way Act, 2000). The AONB Management Plan is a material consideration in relation to development control and forward planning. Using and adhering to the landscape guidelines within this document will also help public bodies to meet their statutory duties to have regard to the purposes of conserving and enhancing the natural beauty of the AONB in exercising or performing any functions in relation to, or so as to affect AONB land (Section 85 of the Countryside and Rights of Way Act, 2000).

2. What is light pollution?

Light pollution is the result of unwanted and wasted light illuminating the sky. It consists of three aspects:

- **Sky glow:** caused by luminaries emitting light upwards, caused by a scattering of artificial light by airborne dust and water droplets. creating a pink and orange glow which can be seen for miles around urban areas.
- **Glare:** the intense brightness of a light source when viewed against a darker background.
- **Light intrusion/trespass:** light which falls where it is not needed, as it spills beyond the boundary of a property on which it is located.

The human eye can pick out light from a distance of about two miles in a flat landscape, so light can have far reaching visual effects beyond that intended.

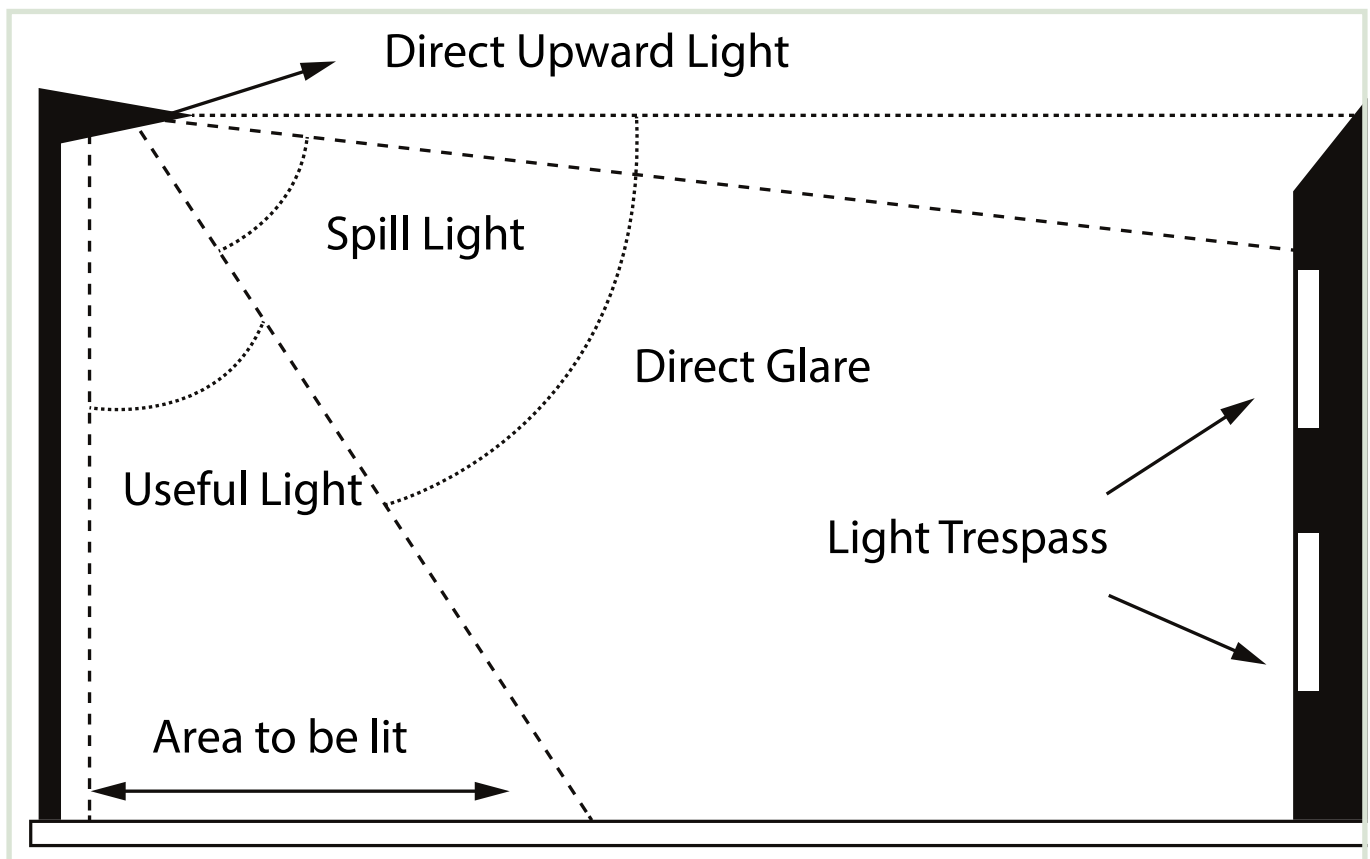


Figure 1 - Light pollution and wasted light

Source: Isles of Scilly Lighting Guide

2.1 Artificial light and wildlife

Artificial light most affects nocturnal animals such as bats and many insects but it can also impact on diurnal species. The main effects of lighting on wildlife are attraction to lights, illumination of animals (which makes them vulnerable to predators) and the interruption of life cycles, especially breeding and migration.

3. The Guidelines

Guideline 1: Use lights only when and where needed





Many people are contributing to the problem of light pollution without realising it because of a common misconception that you need to light an area as brightly as possible to increase the feeling of safety and visibility. In fact, overly bright lighting can produce glare, create deep shadows and increase the contrast between light and dark, which makes it difficult to see beyond the lit area and may make properties less secure.

The first question to ask yourself is whether you need lighting at all, and, if so, how much? Choose the minimum number of fixtures that will meet your need and consider how and when the lighting units will be switched on. A time switch or motion sensor may save you money and reduce the time your lights are on. If your lighting is for security make sure that it is only on when monitored, otherwise you are simply providing an aid to would be burglars. Ensure that lights are turned off when not needed. In rural areas all night lighting is very rarely required.

Guideline 2: Use only as much light as you need

Choose your light fittings and bulbs carefully and look for the Lumen output of the bulb – this is the amount of ‘visible’ light emitted from the bulb – rather than the wattage. The bulb industry has been making radical changes over the past few years and modern bulbs have increased energy efficiency but will still emit the same brightness of light as standard bulbs.

The table below shows the approximate lumen output from varying wattages in standard, halogen, CFL and LED bulbs.

BRIGHTNESS (lumen)	220+	400+	700+	900+	1300+
Standard Bulb 	25 W	40 W	60 W	75 W	100 W
Halogen Bulb 	18 W	28 W	42 W	53 W	70 W
CFL Bulb 	6 W	9 W	12 W	15 W	20 W
LED Bulb 	4 W	6 W	10 W	13 W	18 W

Light Bulbs ← **< 600 is better**

Figure 2 - Approximate lumen output emitted from light sources of varying wattages

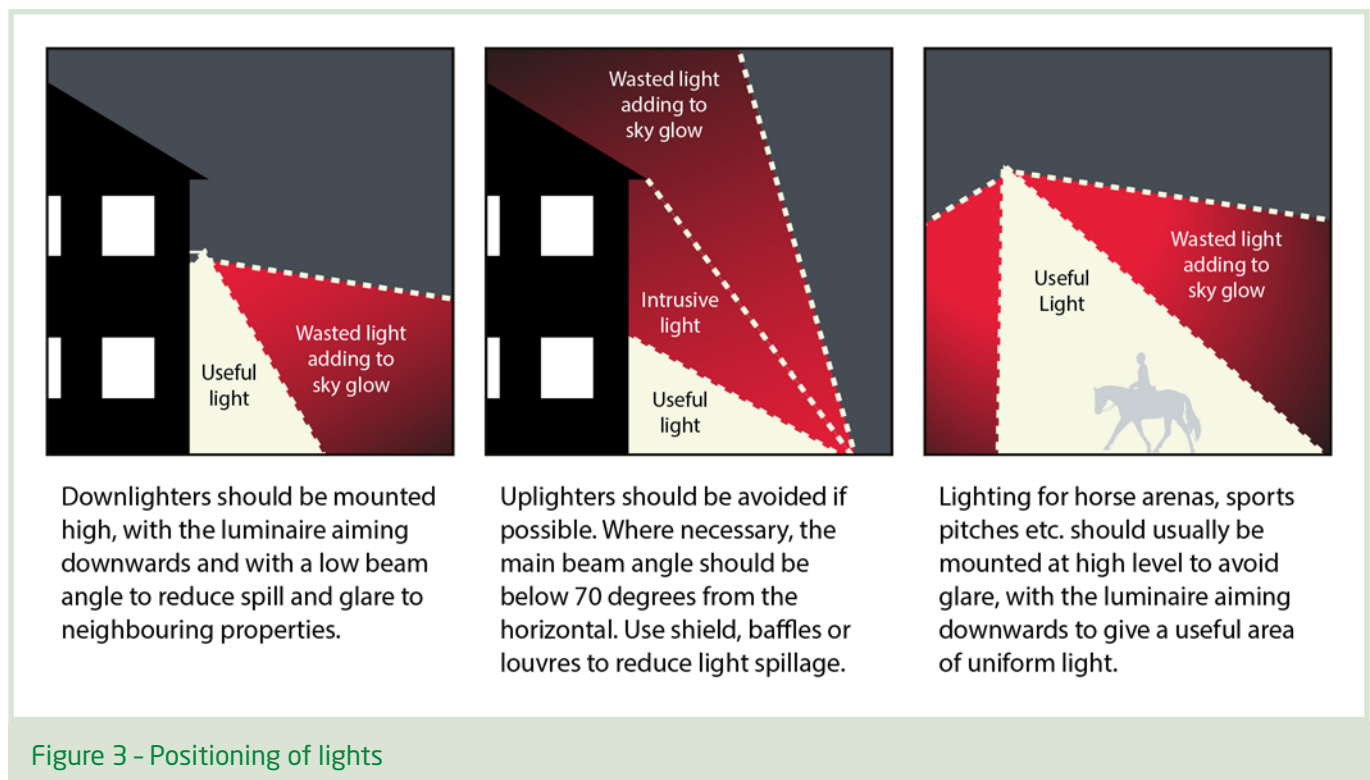
Source: Good Practice Guide for Outside Lighting in Northumberland International Dark Sky Park

Guideline 3: Consider the colour temperature of your lights

Manufacturers tend to describe light in phrases such as 'brilliant white' or 'cool white'. There are different tones of white light and they are usually measured by the 'Kelvin scale'. If possible look for bulbs which emit light in the 2,700k to 3,000k range – a 'warm white'. This will avoid the 'blue' white light (in the range 6,000k – 7,000k) which is believed to be worse for wildlife, with moths being particularly affected. Light in this spectrum is also more likely to reflect from grass and foliage and scatters high into the atmosphere causing skyglow. Many people believe blue-white light also impacts on our natural sleep cycles.

Guideline 4: Shine your lights down (wherever possible), not up

Where and how you position your lights is key to making sure that you don't cause light pollution. In most cases aim to use a high mounting height¹, so that your luminaire aims downwards and the beam angles are low, reducing glare. Light should be directed only where it is needed and should not spill into gardens or surrounding semi-natural habitats.



When lighting vertical structures, direct the light downwards wherever possible. If there is no alternative to 'up' lighting then use shields, baffles or louvres to help reduce the spill of light around and over the structure.

Horizontal cut off luminaires should be used to reduce both glare and sky glow and to minimise light intrusion within the landscape.

Be aware that light from inside buildings can also be visible outside through doors and windows and add to the light pollution of an area. This is especially true where buildings have large areas of glass. Curtains or shutters may help.

¹ It may also be necessary to consider the effects of a new pole or mounting structure in day time views

4. Planning Regulations

The National Planning Policy Framework (paragraph 180) states that planning policies and decisions should ensure that new development is appropriate for its location, taking into account factors such as the natural environment and potential sensitivity of the site or wider area. It further states that such policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Many Local Plans and Neighbourhood Development Plans contain, or will contain, policies on lighting. Local Planning Authorities (LPAs) are often guided by the Institution of Lighting Engineers' document 'Guidance notes for the reduction of light pollution' which establishes four types of Environmental Zones, within each of which there is a different approach to the provision of external lighting. The four environmental zones are defined as: E1 'National parks', 'Areas of Outstanding Natural Beauty' or other 'dark landscapes', E2 Areas of 'low district brightness' (e.g. in a rural location often adjacent but outside a zone E1), E3 Areas of 'medium district brightness' (e.g. in urban locations), E4 Areas of 'high district brightness' (e.g. in an urban centre with high night-time activity).

The Malvern Hills Area of Outstanding Natural Beauty, as an E1 zone, is an environment which is categorised as 'intrinsically dark' and every effort should be made to avoid light pollution within it.

Before you install a lighting scheme you should always check to make sure that you are complying with relevant policies and guidance. Since 2006 'artificial light' has been added to the list of possible statutory nuisances and local authorities have a duty to investigate any complaints about light nuisance.

Non-domestic buildings will need planning permission if the installation of a lighting scheme represents a material change of a structure or an engineering operation. When determining planning applications the local authority may seek to minimise light pollution through planning conditions – such as the light levels and hours of illumination.

Planning permission is not usually required for householders installing external lighting on their homes unless they are fixed to a listed building. However, domestic security lighting, in particular, is a major cause of light pollution in rural areas so it is important to try to reduce the impact of the lighting outside of our homes.

Ménages, sports pitches and other non-domestic sites

The development of outdoor ménages usually requires planning permission. Whilst such developments may be permitted if they do not result in any detrimental impact on the landscape and ecology of the area, requests for lighting ménages within the AONB may be resisted in line with AONB policy. External lighting, in particular high level floodlights on columns, can be a prominent and incongruous feature in the countryside, especially where it reflects off light-coloured surfaces, and large illuminated areas should be avoided within sensitive landscapes. If there are circumstances where lighting is essential it is expected that the ménage should be inconspicuously sited within farmsteads or existing groups of buildings to minimise the impact of lighting as well as the impact on day time views. Expert advice should be sought to ensure that light pollution is minimised. Any other large area within the AONB which requires lighting, such as sports pitches, school grounds, community buildings and car parks, will be a potential source of light pollution unless carefully designed. It is vitally important for the environment that our dark skies are respected and that unwanted light spill is avoided. Again, it is expected that such developments will be closely associated with existing group of buildings.

The guidelines outlined here are not specific to ménage or sports pitch lighting and consideration will need to be given to the siting and height of columns, the type of bulb used, the design and number of floodlights and the surfaces onto which they will shine, in order to minimise their impact. Lighting larger areas to ensure safety whilst minimising light pollution requires specialist knowledge. Planning applications should set out clearly whether or not artificial lighting is proposed and if so how light pollution will be minimised.

5. Good practice examples

5.1 Malvern's Victorian Gas Lamps

Malvern's gas lamps are an important part of the town's Victorian heritage. There were once 1250 of them and 104 of the original lamps still survive. Since 2010 the Transition Gasketeers (part of Transition Malvern) have been actively refurbishing and improving them, funded by Malvern Town Council and with considerable volunteer effort.

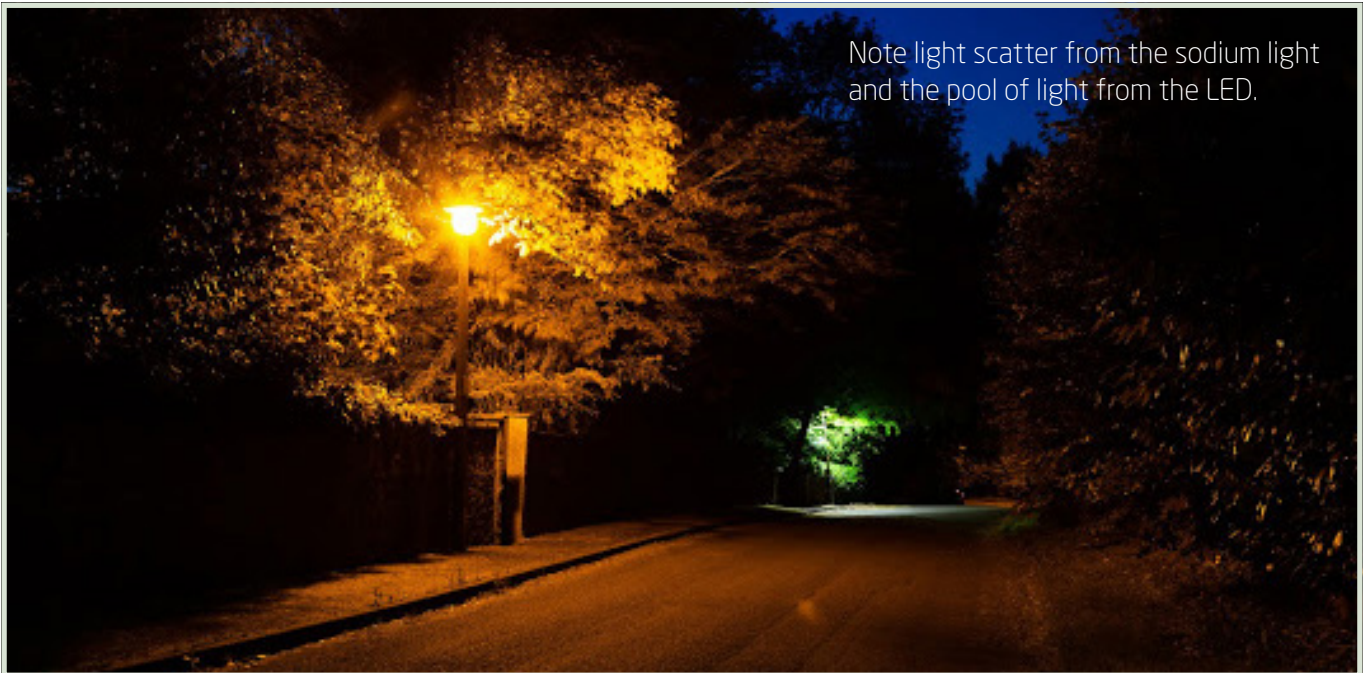
An improved design has resulted in a brighter light range, an 80% reduction in maintenance costs and a 70% reduction in gas consumption. The lights are now up to 10 times brighter but the modifications have increased light intensity whilst producing near zero light pollution and retaining the characteristic soft glow of the lamps. The renovated lamps have been so successful that new electrically powered 'gas' lamps are now also being installed.

The gas lamps produce a soft light which only illuminates the immediate area, yet which provides enough light for pedestrians to feel safe. A light sensor ensures that the lamps are not lit in daylight hours.



Figure 4 - Victorian gas lamp

5.2 Street Lighting, West Malvern



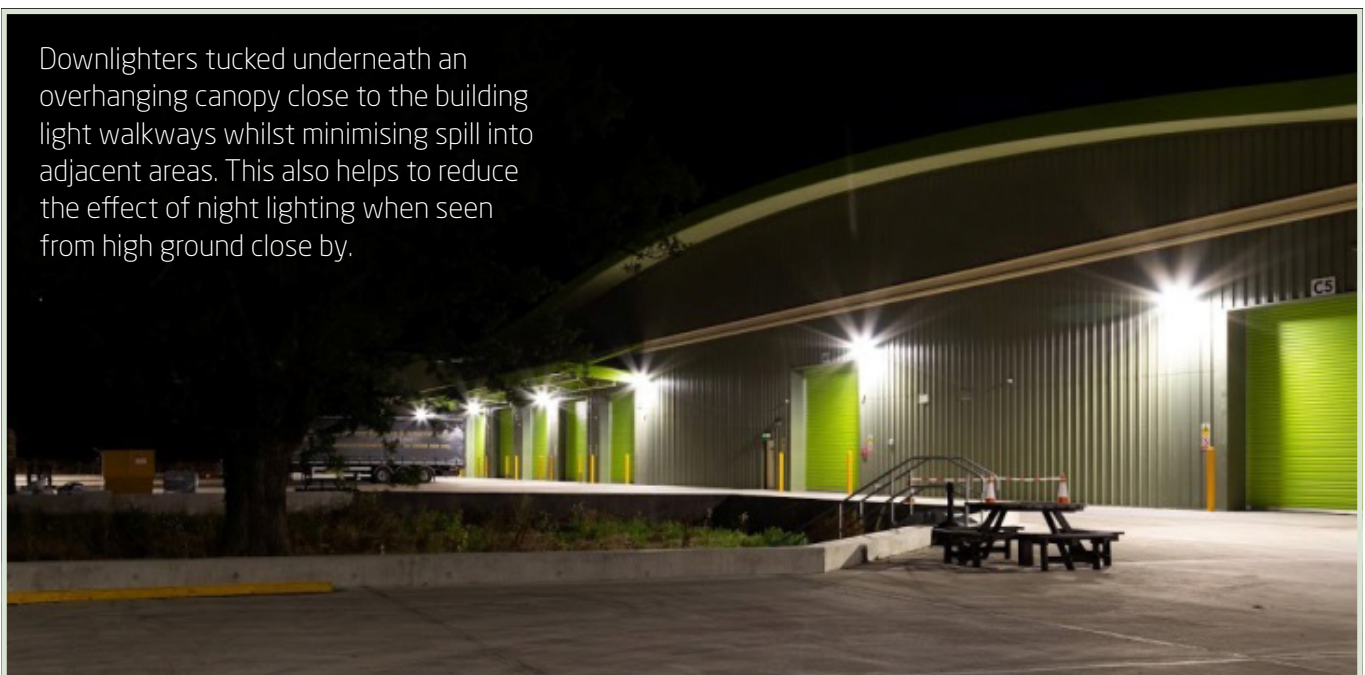
Note light scatter from the sodium light and the pool of light from the LED.

Figure 5 - Contrast between old style sodium street light in foreground and new LED light in background

Old style sodium street lights scatter light in all directions, including upwards to the sky where they cause direct light pollution. These street lights are being replaced throughout the AONB by new, efficient LED lights with full horizontal cut off to minimise glare and sky glow. Worcestershire County Council LED street lights have a colour temperature which is low in the blue light that can have a negative impact on wildlife.

5.3 Warehouse at Blackmore Park

Constructed in 2017/18, care has been taken to reduce the impact of outdoor lighting at this warehouse on the outskirts of Malvern. It sits in a rural setting and is part of the expansive eastern views which people enjoy from the ridge of the Malvern Hills. Lighting is restrained and has been sensitively positioned so that this large site, which is operational at night time, is not over-lit.



Downlighters tucked underneath an overhanging canopy close to the building light walkways whilst minimising spill into adjacent areas. This also helps to reduce the effect of night lighting when seen from high ground close by.

Figure 6 - Downlighters under canopy

Path edge bollards produce just enough light to mark routes and are sparingly used throughout the site.

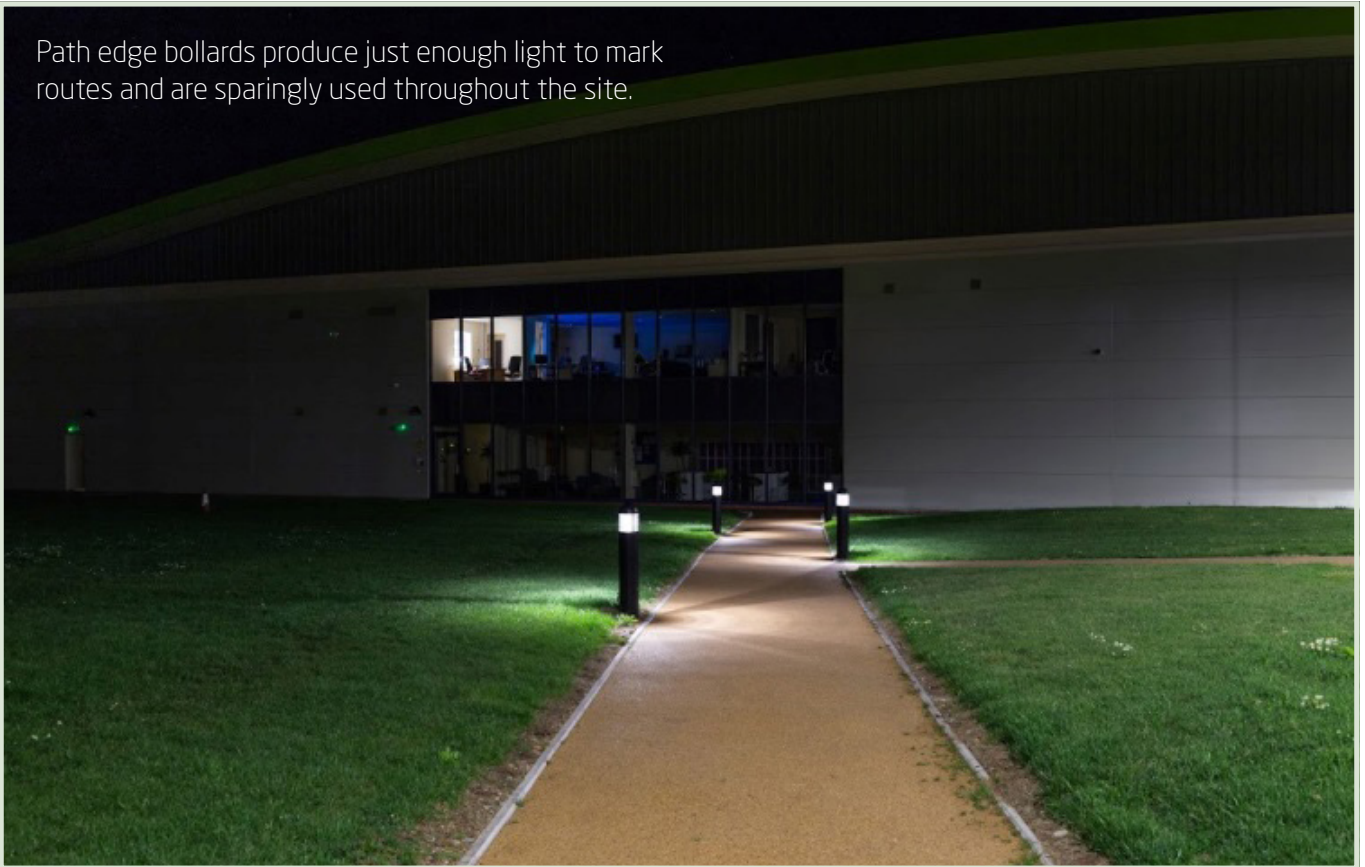
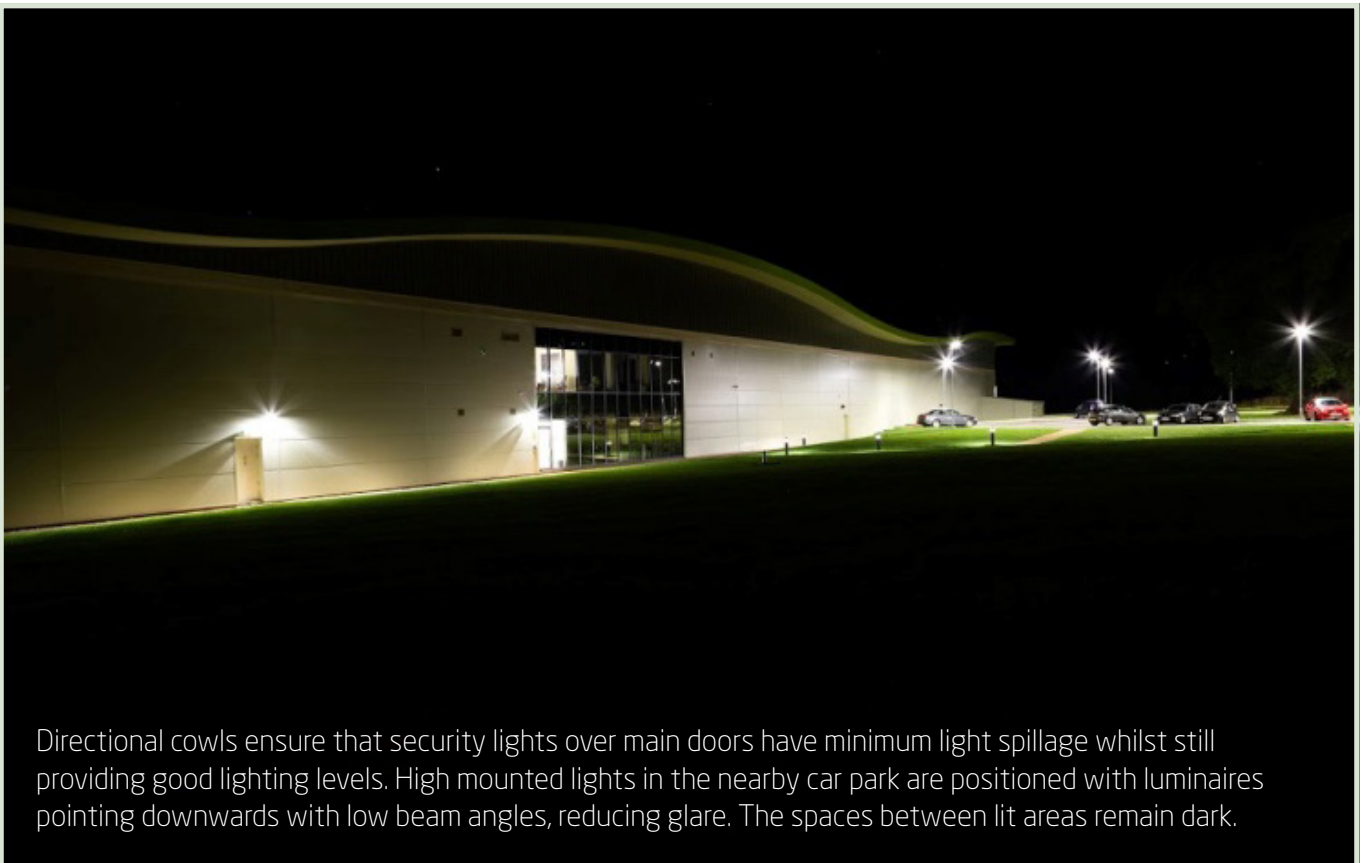


Figure 7 - Path bollards



Directional cowls ensure that security lights over main doors have minimum light spillage whilst still providing good lighting levels. High mounted lights in the nearby car park are positioned with luminaires pointing downwards with low beam angles, reducing glare. The spaces between lit areas remain dark.

Figure 8 - Restrained site lighting

The following bodies provide core grant support to the Malvern Hills AONB Partnership:



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