

Good practice guide for outdoor lighting in the Malvern Hills Area of Outstanding Natural Beauty

1.0 Introduction

The Malvern Hills AONB (MHAONB) is renowned for its natural 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 people 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. However, whilst the AONB has legal protection on the ground the sky above it is not protected in the same way.

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 where it is needed and when it is needed.

2.0 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.

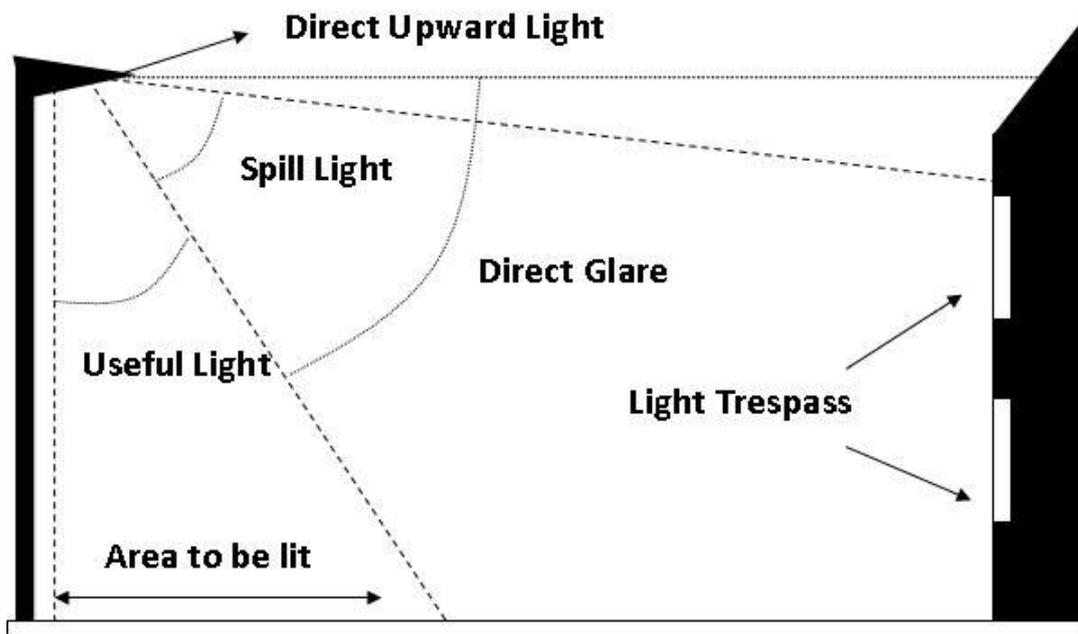


Fig 1 – Light pollution and wasted light (Taken from Isles of Scilly Lighting Guide)

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.

3.0 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 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.

Approximate lumen output emitted from light sources of varying wattages

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

Fig 3. Approximate lumen output emitted from light sources of varying wattages

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 between the 2,700k to 3,000k range – a 'warm white'. That will avoid the 'blue' white light (in the range 6,000k – 7,000k) which is believed to be especially bad for wildlife, with moths being particularly affected. Light in this spectrum is 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.

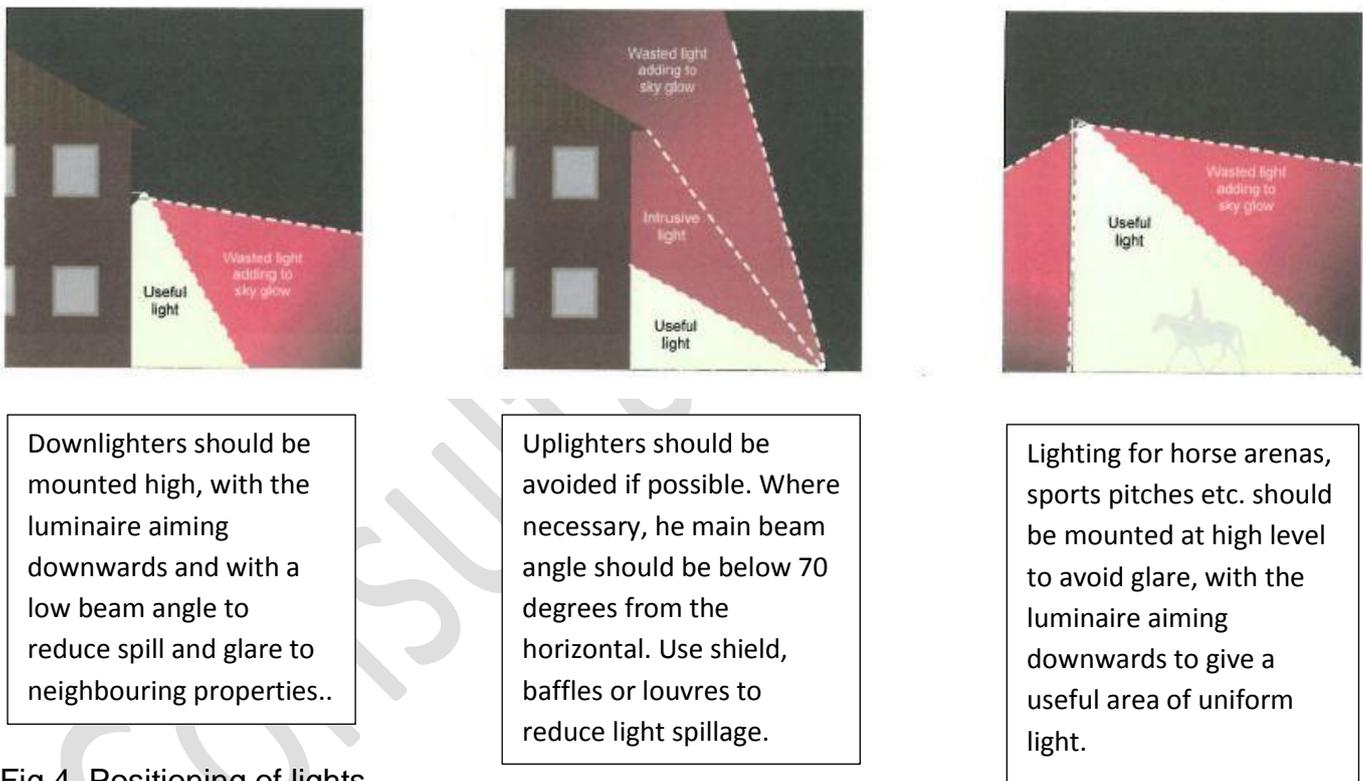


Fig 4. Positioning of lights

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 through doors and windows and add to the light pollution of an area. 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.

4.0 Planning Regulations

Many Local Planning Authorities (LPA's) have produced, or are producing, policies for lighting which will become part of the local development framework. Before you install a lighting scheme you should always check with your LPA to make sure that you are complying with their policies or 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 lighting the outside of our homes.

5.0 AONB Policy

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 draft 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).

6.0 Good practice examples

6.1 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, reduced maintenance costs by 80% and reduced gas consumption by 70%. The lights are now up to ten 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.

Fig 5 Victorian gas lamp

6.3 Street Lighting, West Malvern



Figure 6 – old style sodium street light scatters light in all directions whilst new style LED (in distance) directs all light down below the horizontal. Note pool of light on ground.

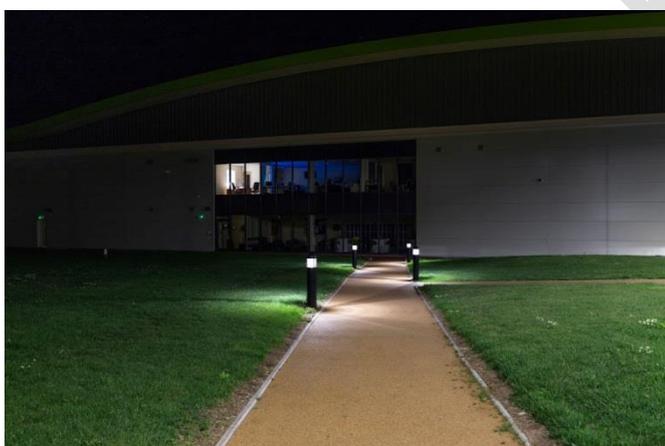
6.3 Warehouse at Blackmore Park

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 and busy site is not over lit.



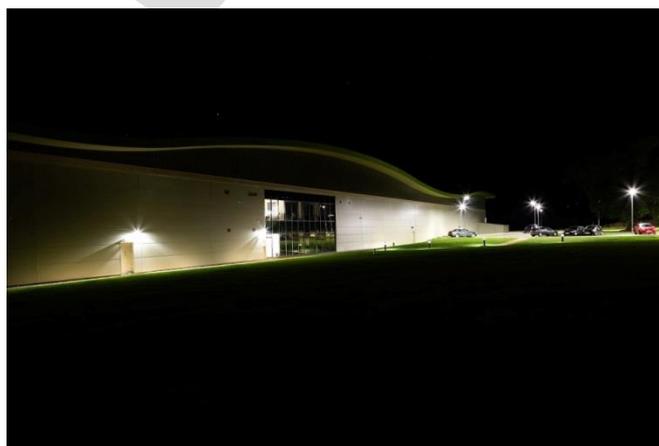
Downlighters tucked underneath an overhanging canopy close to the building light walkways whilst minimising spill into adjacent areas. This also helps to reduce the effect of night lighting when seen from above from high ground close by.

Fig 7 Downlighters under canopy



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

Fig 8 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.

Fig 9 Restrained site lighting