



Craven Local Plan

OBTRUSIVE LIGHT

Evidence Base

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Introduction

This document is a compilation of all obtrusive light evidence underpinning the Craven Local Plan. The following table describes the document's constituent parts.

Title	Date	Comments
ILP Guidance Notes for the Reduction of Obtrusive Light (Part I)	2011	This publication from the Institute of Lighting Professionals provides guidance on how to avoid sky glow, glare and intrusion from obtrusive artificial light, which causes environmental harm, a nuisance to others and a waste of energy.
Forest of Bowland AONB Obtrusive Lighting Position Statement (Part II)	N/A	This statement provides guidance to all AONB planning authorities and will assist in the determination of planning applications for any development which may include exterior lighting.

Part I: ILP Guidance Notes for the Reduction of Obtrusive Light
2011

GUIDANCE NOTES FOR THE REDUCTION OF OBTRUSIVE LIGHT

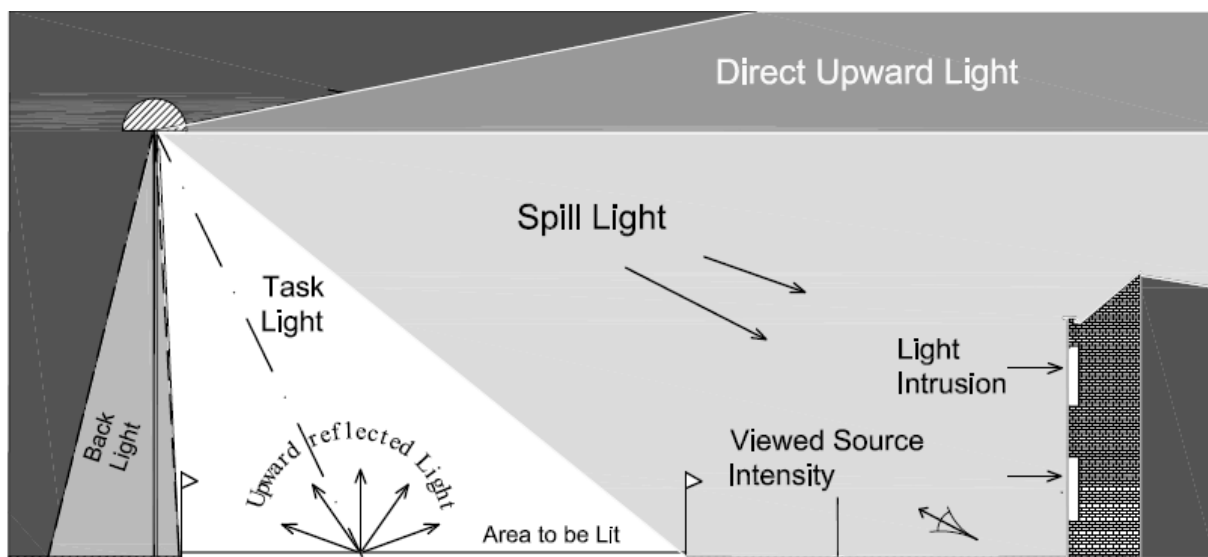
“Think before you light - The right amount of light, where wanted, when wanted.”

Man's invention of artificial light has done much to safeguard and enhance our night-time environment but, if not properly controlled, **obtrusive light** (sometimes referred to as light pollution) can present serious physiological and ecological problems.

Obtrusive Light, whether it keeps you awake through a bedroom window or impedes your view of the night sky, is a form of pollution, which may also be a nuisance in law and which can be substantially reduced without detriment to the lighting task.

Sky glow, the brightening of the night sky, **Glare** the uncomfortable brightness of a light source when viewed against a darker background, and **Light Intrusion (“Trespass”)**, the spilling of light beyond the boundary of the property or area being lit, are all forms of obtrusive light which may cause nuisance to others and waste money and energy. Think before you light. Is it necessary? What effect will it have on others? Will it cause a nuisance? How can you minimise the problem?

Figure 1 – Types of obtrusive light



Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light. Organisations from which full details of these standards can be obtained are given on the last page of this leaflet.

Dim or switch off lights when the task is finished. Generally a lower level of lighting will suffice to enhance the night time scene than that required for safety and security.

“Good Design equals Good Lighting”

Any lighting scheme will consist of three basic elements: a light source, a luminaire and a method of installation.

Light sources (Lamps)

Remember that the light source output in LUMENS is not the same as the wattage and that it is the former that is important in combating the problems of obtrusive light.

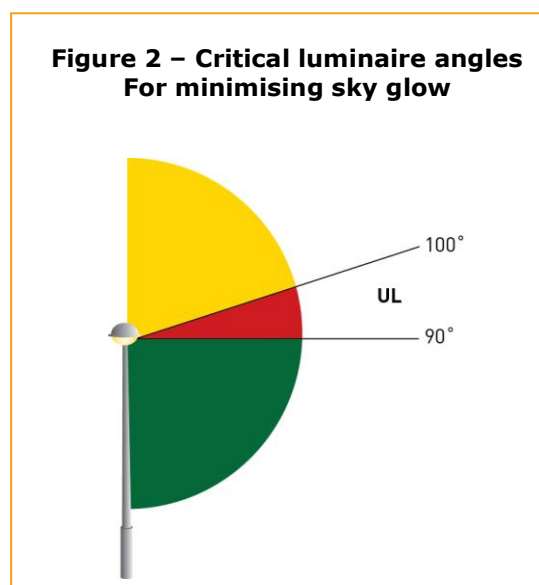
Most nighttime visual tasks are only dependant on light radiated within the visual spectrum. It is therefore NOT necessary for light sources to emit either ultra-violet or infra-red radiation unless specifically designed to do so. It is also understood that light from the shorter wavelengths of the spectrum has important effects on both flora and fauna that should be considered.

Research indicates that light from the blue end of the spectrum has important non-visual effects on the health of the human body, in particular in our sleep/wake patterns. It is therefore important to appreciate that while in obtrusive light terms the use of blue light should be minimised, there are many night-time tasks such as driving and sports where to be fully awake is an important aid to safety.

Luminaires

Care should always be taken when selecting luminaires to ensure that appropriate products are chosen and that their location will reduce spill light and glare to a minimum.

Use specifically designed lighting equipment that minimises the upward spread of light near to and above the horizontal. The most sensitive/critical zones for minimising sky glow are those between 90° and 100° as shown in Figure 2 and referred to as the lower, upward light output zone (UL).



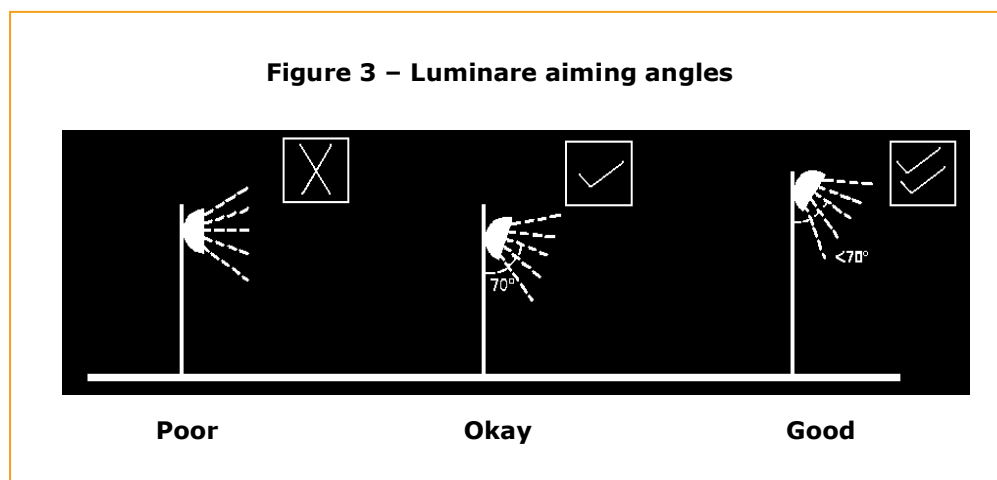
For most sports and area lighting installations the use of luminaires with double-asymmetric beams designed so that the front glazing is kept at or near parallel to the surface being lit should, if correctly aimed, ensures minimum obtrusive light.

Appendices 1 and 2 to these notes gives more details of how to choose and if necessary modify luminaires.

Installation

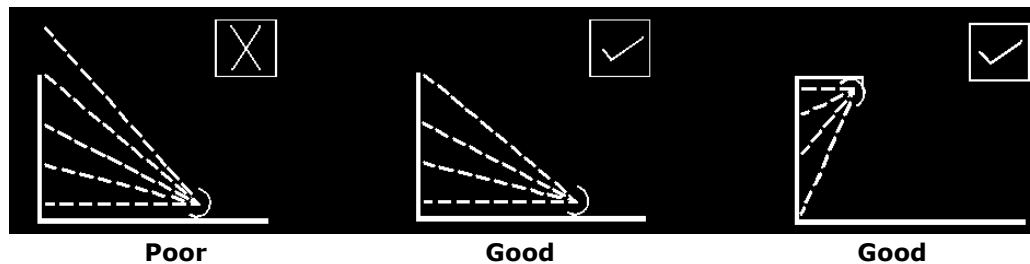
In most cases it will be beneficial to use as high a mounting height as possible, giving due regard to the daytime appearance of the installation. The requirements to control glare for the safety of road users are given in Table 3.

Keep glare to a minimum by ensuring that the main beam angle of all lights directed towards any potential observer is not more than 70°. Higher mounting heights allow lower main beam angles, which can assist in reducing glare. In areas with low ambient lighting levels, glare can be very obtrusive and extra care should be taken when positioning and aiming lighting equipment. With regard to domestic security lighting the ILP produces an information leaflet GN02:2009 that is freely available from its website.



When lighting vertical structures such as advertising signs, direct light downwards wherever possible. If there is no alternative to up-lighting, as with much decorative lighting of buildings, then the use of shields, baffles and louvres will help reduce spill light around and over the structure to a minimum.

For road and amenity lighting installations, (see also design standards listed on Page 5) light near to and above the horizontal should normally be minimised to reduce glare and sky glow (Note ULR's in Table 2). In rural areas the use of full horizontal cut off luminaires installed at 0° uplift will, in addition to reducing sky glow, also help to minimise visual intrusion within the open landscape. However in some urban locations, luminaires fitted with a more decorative bowl and good optical control of light should be acceptable and may be more appropriate.

Figure 4 – Façade Illumination

Since 2006 “Artificial Light” has been added to the list of possible Statutory Nuisances in England, Wales and Scotland. The monitoring of such nuisances will be the responsibility of Environmental Health Officers (EHOs) for which separate guidance is being produced.

With regard to the planning aspect, many Local Planning Authorities (LPAs) have already produced, or are producing, policies that within the planning system will become part of their local development framework. For new developments there is an opportunity for LPAs to impose planning conditions related to external lighting, including curfew hours.

The Scottish Executive has published a design methodology document (March 2007) entitled “Controlling Light Pollution and Reducing Energy Consumption” to further assist in mitigating obtrusive light elements at the design stage.

ENVIRONMENTAL ZONES

It is recommended that Local Planning Authorities specify the following environmental zones for exterior lighting control within their Development Plans.

Table 1 – Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone.

NB: Zone E0 must always be surrounded by an E1 Zone.

DESIGN GUIDANCE

The following limitations may be supplemented or replaced by a LPA's own planning guidance for exterior lighting installations. As lighting design is not as simple as it may seem, you are advised to consult and/or work with a professional lighting designer before installing any exterior lighting.

Table 2 – Obtrusive Light Limitations for Exterior Lighting Installations – General Observers

Environment al Zone	Sky Glow ULR [Max %] ⁽¹⁾	Light Intrusion (into Windows) E_v [lux] ⁽²⁾		Luminaire Intensity I [candelas] ⁽³⁾		Building Luminance Pre-curfew ⁽⁴⁾
		Pre- curfew	Post- curfew	Pre- curfew	Post- curfew	Average, L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

ULR = **Upward Light Ratio of the Installation** is the maximum permitted percentage of luminaire flux that goes directly into the sky.

E_v = **Vertical Illuminance in Lux** - measured flat on the glazing at the centre of the window.

I = **Light Intensity in Candelas (cd)**

L = **Luminance in Candelas per Square Metre (cd/m²)**

Curfew = **the time after which stricter requirements (for the control of obtrusive light) will apply**; often a condition of use of lighting applied by the local planning authority. If not otherwise stated - 23.00hrs is suggested.

***** = **Permitted only from** Public road lighting installations

(1) Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light, e.g. ground recessed luminaires, ground mounted floodlights, festive lighting, to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

- (2) Light Intrusion (into Windows)** – These values are suggested maxima and need to take account of existing light intrusion at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light intrusion into the window down to the post curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.
- (3) Luminaire Intensity** – This applies to each luminaire in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.
- (4) Building Luminance** – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

Table 3 – Obtrusive Light Limitations for Exterior Lighting Installations – Road Users		
Road Classification ⁽¹⁾	Threshold Increment (TI)	Veiling Luminance (Lv)
No road lighting	15% based on adaptation luminance of 0.1cd/m ²	0.04
ME6/ ME5	15% based on adaptation luminance of 1cd/m ²	0.25
ME4/ ME3	15% based on adaptation luminance of 2cd/m	0.40
ME2 / ME1	15% based on adaptation luminance of 5cd/m ²	0.84

TI = **Threshold Increment** is a measure of the loss of visibility caused by the disability glare from the obtrusive light installation

Lv = **Veiling Luminance** is a measure of the adaptation luminance caused by the disability glare from the obtrusive light installation

(1) = **Road Classifications** as given in BS EN 13201 - 2: 2003 Road lighting Performance requirements. Limits apply where users of transport systems are subject to a reduction in the ability to see essential information. Values given are for relevant positions and for viewing directions in path of travel. For a more detailed description and methods for determining, calculating and measuring the above parameters see CIE Publication 150:2003.


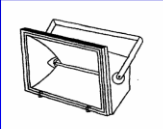
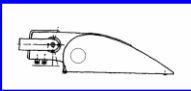
RELEVANT PUBLICATIONS AND STANDARDS:

British Standards: www.bsi.org.uk	BS 5489-1: 2003 Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas BS EN 13201-2:2003 Road lighting – Part 2: Performance requirements BS EN 13201-3:2003 Road lighting – Part 3: Calculation of performance BS EN 13201-4:2003 Road lighting – Part 4: Methods of measuring lighting performance. BS EN 12193: 1999 Light and lighting – Sports lighting BS EN 12464-2: 2007 Lighting of work places – Outdoor work places
Countryside Commission/ DOE	Lighting in the Countryside: Towards good practice (1997) (<i>Out of Print but available on www.communities.gov.uk/index.asp?id=1144823</i>)
UK Government / Defra www.defra.gov.uk	Statutory Nuisance from Insects and Artificial Light – Guidance on Sections 101 to 103 of the Clean Neighbourhoods and Environment Act 2005 Road Lighting and the Environment (1993) (Out of Print)
CIBSE/SLL Publications: www.cibse.org	CoL Code for Lighting (2002) LG1 The Industrial Environment (1989) LG4 Sports (1990+Addendum 2000) LG6 The Exterior Environment (1992) FF7 Environmental Considerations for Exterior Lighting (2003)
CIE Publications: www.cie.co.at	01 Guidelines for minimizing Urban Sky Glow near Astronomical Observatories (1980) 83 Guide for the lighting of sports events for colour television and film systems (1989) 92 Guide for floodlighting (1992) 115 Recommendations for the lighting of roads for motor and pedestrian traffic – Second Edition (2010) 126 Guidelines for minimizing Sky glow (1997) 129 Guide for lighting exterior work areas (1998) 136 Guide to the lighting of urban areas (2000) 150 Guide on the limitations of the effect of obtrusive light from outdoor lighting installations (2003) 154 The Maintenance of outdoor lighting systems (2003)
ILP Publications: www.theilp.org.uk	TR 5 Brightness of Illuminated Advertisements (2001) TR24 A Practical Guide to the Development of a Public Lighting Policy for Local Authorities (1999) GN02 Domestic Security Lighting, Friend or Foe
ILP/CIBSE Joint Publications	Lighting the Environment - A guide to good urban lighting (1995)
ILP/CSS Publications	Joint Code of Practice for the installation, maintenance and removal of seasonal decorations. (2005)
ILP/CfDS Joint Publication dark-skies.org	Towards Understanding Sky glow. 2007
IESNA www.iesna.org	TM-15-07 (R) Luminaire Classification System for Outdoor luminaires

NB: These notes are intended as guidance only and the application of the values given in Tables 2 & 3 should be given due consideration along with all other factors in the lighting design. Lighting is a complex subject with both objective and subjective criteria to be considered. The notes are therefore no substitute for professionally assessed and designed lighting, where the various and maybe conflicting visual requirements need to be balanced.

APPENDIX 1 - PROPOSED OUTDOOR LUMINAIRE CLASSIFICATION SYSTEM

Variable Aim Luminaires – General Classifications:

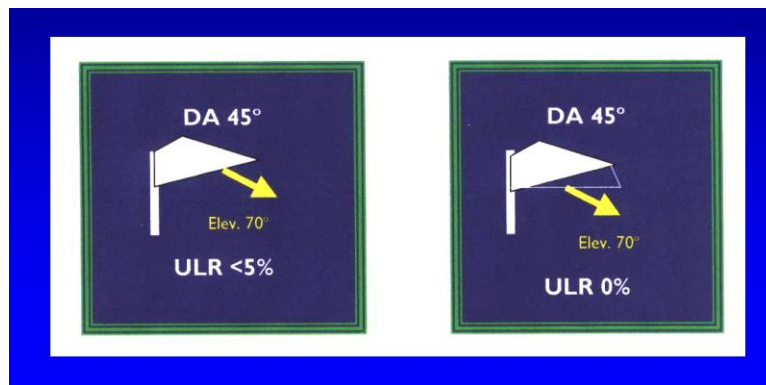
➤ Type A	Symmetrical	
➤ Type B	Asymmetrical	
➤ Type C	Double-Asymmetrical	

Proposed labelling System:

Fixed Position luminaires



Variable Aim Luminaires
(Shown here for a 45° Double-Asymmetric luminaire aimed at 70° – with and without a cowl).

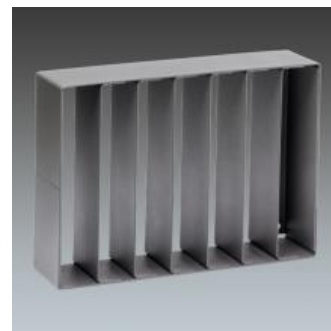


APPENDIX 2 - ILLUSTRATIONS OF LUMINAIRE ACCESSORIES FOR LIMITING OBTRUSIVE LIGHT (images provided by Philips and Thorn)

Cowl (or Hood)



External Louvre



SHIELD



SHEILD "Barn Doors"



Double Asymmetric Luminaire



Simple Hood



Circular Louvre



Cowl & Louvre



Internal Louvre (horizontal)



Internal Louvre (vertical)



Part II: Forest of Bowland AONB Obtrusive Lighting Position Statement

Obtrusive Lighting Position Statement

1. Introduction

1.1 Over the last century large parts of Britain have rapidly lost access to naturally dark skies. Light in the wrong place, or obtrusive lighting, is one of the major unaddressed sources of pollution in this country and it affects people, wildlife and our landscapes. In 2009 the Royal Commission on Environmental Pollution published its report on Artificial Light in the Environment¹ and recommended that **those responsible for the management of existing National Parks and Areas of Outstanding Natural Beauty and the equivalent National Scenic Areas in Scotland seek to eliminate unnecessary outdoor light and to better design and manage that which cannot be eliminated.**

1.2 In the Forest of Bowland AONB our relative isolation means that there are areas of land still largely unaffected by light pollution, however where lighting is obtrusive (eg on isolated dwellings or within some developments) this can seriously affect the quality of the landscape which was designated partly because of its tranquility and its value to heritage and biodiversity. In the words of the Royal Commission: *'we believe that access to the natural beauty of the night sky is every bit as important as the preservation of other aspects of natural beauty which society routinely seeks to protect for the enjoyment of its citizens and for posterity.'*

2. Purpose of this Position Statement

2.1 This paper has been produced in order to clearly set out the position of the AONB Partnership with regards to obtrusive lighting in the Forest of Bowland. It aims to provide guidance to assist the six local planning departments which operate in the area, and which have a duty to further the purposes of the AONB. It is hoped that this guidance will assist in the determination of planning applications for any development which may include exterior lighting.

2.2 This Position Statement should be read in conjunction with the AONB's Guidance on Lighting for residents and businesses and with the examples of Good Practice we have compiled. These additional documents aim to encourage and support a gradual removal of existing obtrusive lighting as this cannot be tackled via the planning process.

2.3 This document, plus the Guidance and Good Practice, complements the AONB's work on Dark Sky tourism by providing encouragement and support to partners wanting to lend their support to the initiative.

3. Obtrusive Lighting and Dark Skies

3.1 Most people expect to see some lighting at night as it helps to guide your way and to provide a sense of security. However, light in the wrong place (where it is not intended or wanted), or at the wrong time, is a form of pollution as it spoils the environment. Artificial light creating an impact on health and wellbeing, can be classed as a statutory nuisance².

3.2 The RCEP report mentioned above, identified that obtrusive lighting can affect the migration and feeding behaviour of some birds and the feeding habits of insects and their predators. It can also have an impact on human health and wellbeing through causing sleep disturbance and stress. Importantly, obtrusive lighting can reduce the intensity of dark skies: reducing the opportunity to view constellations, the Milky Way and astronomical events.

3.3 Light pollution can take on various forms and can originate from different sources:

Form	Source	Effect
Glare	Spotlights, security lamps or headlamps often incorrectly sited or not shielded	Excessive contrast between light and dark in the field of vision
Trespass	Poorly directed exterior lights	Intrusive light affecting neighbouring properties
Scenic intrusion	Clutter or profligacy of lights in a natural environment	Over illumination and distraction, a reduction in the scenic quality and loss of dark skies
Sky glow	Street, traffic and building lights, creating a combination of reflection and refraction of light in the atmosphere	Causes a lack of contrast between a dark and light sky many miles from the source

¹ *Artificial Light in the Environment*, The Royal Commission on Environmental Pollution, 2011

² Clean Neighbourhoods and Environment Act, 2005

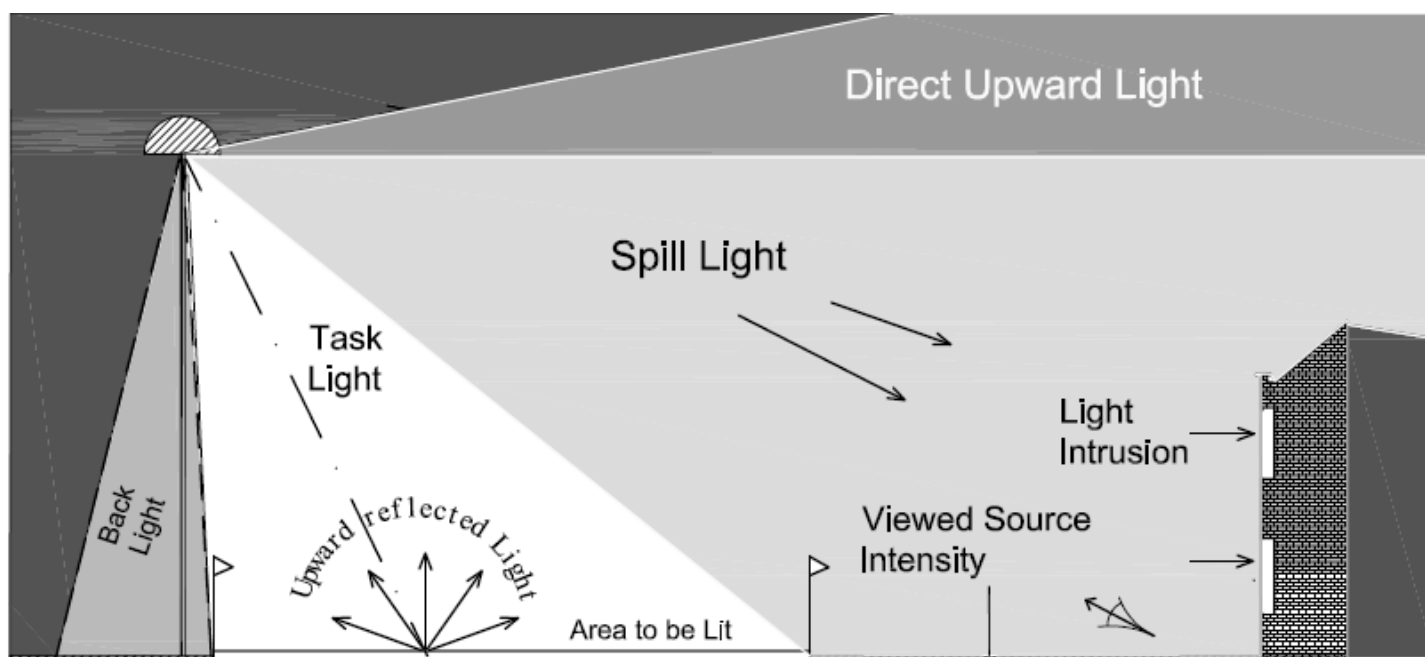


Fig 1: Types of obtrusive light (from ILP Guidance Notes)

4. Reasons for Control

4.1 Guidance produced by the Institution of Lighting Professionals³ identifies five Environmental Zones for local authorities to specify exterior lighting controls in their Development Plans. In this Guidance, zone EI: National Parks and AONBs are categorised as having 'natural surroundings' which should be kept 'intrinsically dark'.

4.2 A reduction in obtrusive external lighting will improve the night time scenic quality of the AONB by maintaining this intrinsic darkness. It will also lessen the impact on wildlife such as birds, invertebrates and plants which can be affected by artificial lighting when it masks seasonal and diurnal patterns. Controlling obtrusive lighting at night will also bring benefits to residents through a reduction in glare and trespass.

4.3 Any reduction of light pollution will also help to maintain and improve the area's dark skies which are becoming a tourism asset: this contributes to the local economy via increased visitor spend in accommodation and eateries, and the increased use of local services.

4.4 Reducing excessive exterior lighting will cut energy costs and saves carbon. In some areas total 'switch offs' of public street lighting, especially on highways and motorways has met with public approval and no increase in crime or accidents. In Lancashire there is no appetite for switching off, however dimming will soon be introduced from dusk til dawn on old street lighting stock whilst low cost LED lamps are introduced to around half of the street lights in the county over the next 3 years (2015-18).

5. Position Statement

5.1 It is considered that exterior lighting proposed as part of any new development, within or affecting the boundaries of the AONB, should be **the minimum required and only appropriate to its purpose, so as to protect the area's natural surroundings and intrinsic darkness.**

5.2 Proposals for exterior lights should follow the AONB Guidance and Good Practice and should be able to demonstrate **that there is not a significantly adverse effect, individually or cumulatively, on: the character of the area; the visibility of the night sky; biodiversity (including bats and light sensitive species); and residents, pedestrians or drivers.**

³ Guidance Notes for the Reduction of Obtrusive Light GN01: 2011, Institution of Lighting Professionals

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