Norfolk Coast
Protected Landscape

Dark Skies Guidance

Supporting positive action for dark skies across the Norfolk Coast

Contents

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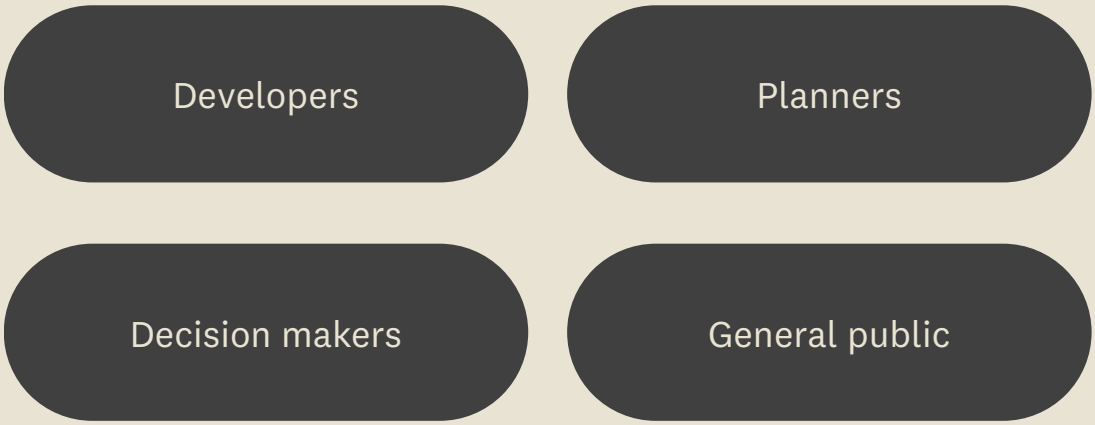
1. Introduction

This guidance supports the Norfolk Coast National Landscape (NCNL) Management Plan 2025-30 and is intended improve understanding of our dark skies and empower people to take positive action to preserve them. This guidance explains why protection is needed and highlights the resources available to support this effort.

The purpose of this guidance is to:

- **Improve understanding and protection** for dark skies around The Wash and Norfolk Coast
- **Empower people to act** for the protection of dark skies
- **Provide best practice examples** for lighting different types of development
- **Support the special qualities** of the NCNL (as outlined in the Management Plan) through the protection of dark skies.

This guidance is aimed at:



Please note: this guidance recognises the need for artificial lighting and does not therefore propose a ban its use. Its purpose is to encourage the use of well-designed, well-placed lighting, operated at suitable times and with appropriate controls.

2. Why dark skies matter

Dark skies are a defining characteristic of the Norfolk Coast. They provide rare opportunities to connect with nature, inspiring a sense of awe, wonder, and tranquillity. However, this valuable natural asset is increasingly threatened by the growth of artificial light at night. Development pressure around The Wash and Norfolk Coast is gradually diminishing dark skies, contributing to the urbanisation of rural areas and negatively affecting wildlife, ecosystem health, local residents and visitors' wellbeing.

To safeguard our dark skies, this guidance promotes three core principles:

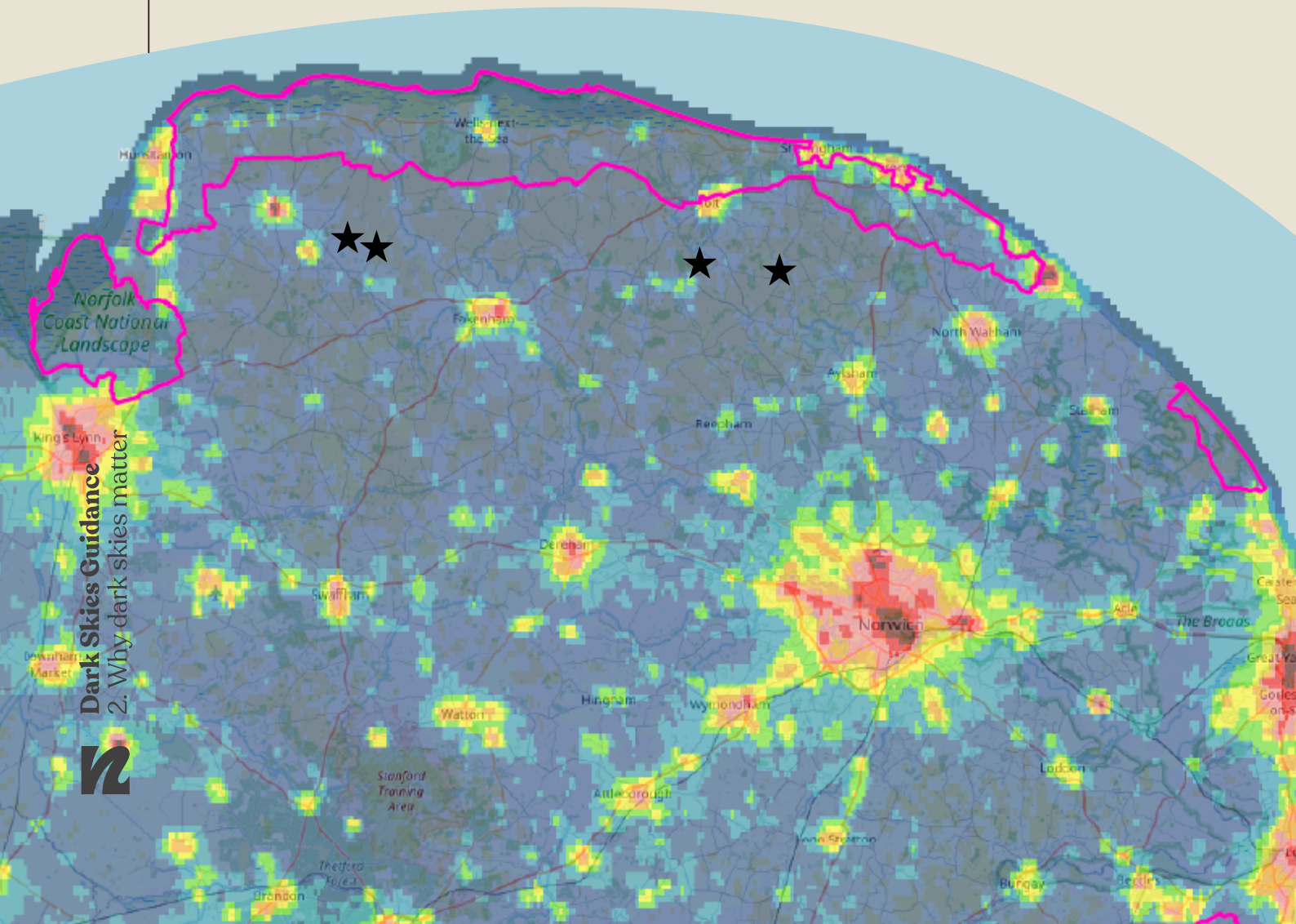
- Avoid unnecessary lighting — only use artificial light where it is essential and clearly justified
- Reduce light pollution — apply good design to both existing and new lighting
- Mitigate impacts — minimise any adverse effects to the greatest reasonable extent

Dark skies in Norfolk

The Countryside Charity (CPRE) and Land Use Consultants (LUC) assess sky quality using satellite data to measure upward light emissions. The map below illustrates variations in sky quality across Norfolk, with the boundaries of the NCNL indicated in pink.

Blue-black areas indicate the best-quality skies where the Milky Way remains visible. Notably, 53% of the NCNL falls within the highest sky quality category. There are four locations within the NCNL which are particularly notable for their lack of light pollution: RSPB Titchwell Marsh, Barrow Common, Wiveton Downs and Kelling Heath. These are marked with stars on the map.

Figure 1: Map showing level of radiance from night lights across Norfolk. Taken from 'Great Britain's Light Pollution and Dark Skies'. © Natural England copyright 2016. Contains Ordnance Survey data © Crown copyright and database right 2016 Earth Observation Group, NOAA National Geophysical Data Center. Developed by LUC.



3. What is light pollution?

DarkSky International identifies four forms of light pollution which impact dark skies:

- Skyglow: The brightening of the night sky, often visible above the horizon in and around urban areas.
- Glare: Excessive or uncomfortable brightness produced when a light source contrasts sharply with a darker background.
- Light trespass (intrusion): Artificial light spilling into areas where it is neither intended nor needed.
- Presence: The simple visibility of artificial light in a dark landscape. Even when lighting is designed to minimise skyglow, glare, and trespass, the mere presence of light can still harm sensitive landscapes, disrupt wildlife and diminish the natural experience of darkness.

Figure 2: From left to right, these images show examples of skyglow, glare, light trespass and presence

4. Lighting metrics

The character and quality of light can be assessed using a number of metrics:

- Lumens (lm): Measures the total light emitted by a source in all directions. Packaging often lists lumens, with 500lm or less generally suitable for most domestic purposes.
- Candela (cd): Indicates the intensity of light in a specific direction, showing how bright the source appears and how far it can be seen. High intensity can cause glare and light intrusion.
- Lux (lx) / Illuminance: Measures the amount of light reaching a surface. Professional guidance often refers to the average maintained illuminance (Em) for specific tasks or activities.
- Correlated Colour Temperature (CCT): Measured in Kelvins (K), CCT describes the colour appearance of light. Higher temperatures produce blue-white light, which can be particularly harmful to wildlife.
- Upward Light Ratio (ULR): The percentage of light emitted upwards from a luminaire (lamp plus fixture). ULR should ideally be zero to prevent skyglow. It can be specified by manufacturers or measured using photometry or imaging.

5. Impacts of light pollution

Light pollution affects many aspects of the Norfolk Coast, including tranquillity, wildlife and human health and wellbeing.

Tranquillity
Tranquillity is a defining quality of the NCNL and dark skies play a vital role in preserving it. Areas with star-filled skies, free from excessive artificial light, enhance the sense of remoteness, peace and natural beauty.

Wildlife
Artificial lighting disrupts natural habitats and the behaviour of many nocturnal species around the Norfolk Coast. Key species dependent on dark skies for feeding and survival include bats, night-flying moths (UK Species of Principal Importance), dormice and other invertebrates — all critical to nature recovery.

- Bats: All bat species are nocturnal specialists and highly sensitive to artificial light. Protected under the Wildlife & Countryside Act (1981), lighting near roosts can cause disturbance and constitute an offence. Refer to ILP GN08/23 Guidance Note 8: Bats and Artificial Lighting for case studies and recommendations.
- Birds: Artificial light can reduce sleep in birds, disrupting breeding cycles and altering insect prey behaviour.
- Invertebrates: Light can fragment populations and disrupt feeding, breeding, and movement. It reduces pollination rates by up to 62% and around one third of insects attracted to lights may die from exposure.
- Plants: Artificial light can interfere with natural plant functions, including flowering, dormancy, germination, and photosynthesis, increasing plant stress and reducing pollination efficiency.

Health and wellbeing
Light pollution can disrupt human circadian rhythms. While direct light into windows is an obvious concern, the general brightening of the night sky also affects health. Blue-rich lighting (above 3,000K) suppresses melatonin production, disrupting sleep and the body's natural repair mechanisms. Poor sleep can lead to reduced attention, increased stress and fatigue.

6. Light pollution management

Effective management of light pollution is essential to protect the NCNL and its wildlife.

Planning and permissions
The UK Planning Portal provides guidance on when planning permission is required for lighting. New developments or non-domestic uses may need planning approval.

While minor domestic lighting is not subject to planning controls, careful consideration should still be given to the potential impacts of artificial light and opportunities for better design.

All development proposals should reference relevant planning policies, lighting guidance and legislation. Reducing light pollution typically requires a combination of:

- Planning controls
- Local Planning Authority street lighting policies
- Statutory duties for public bodies to protect the NCNL
- Relevant legislation, including the Clean Neighbourhoods and Environment Act 2005 and the Wildlife and Countryside Act 1981

Mitigating impacts on wildlife

To minimise harm to sensitive species and habitats:

- Prevent light trespass and glare into ecologically important areas
- Avoid up-lighting or illuminating trees, plants and natural features
- Conduct surveys to identify bat and bird species in the area
- Do not directly illuminate bat roosts, foraging areas or bird nests
- Avoid lighting reflective surfaces such as water
- Use low Correlated Colour Temperatures (CCTs), ideally below 3,000K, with 2,200K being least disruptive to invertebrates

By following these principles, artificial lighting can be carefully managed to balance human needs while protecting the natural environment and night skies of the Norfolk Coast.

Lighting policies

Lighting design within the NCNL should comply with the Development Plans of the relevant Local Authorities. The following councils' planning policies should be consulted:

- Borough Council of King's Lynn and West Norfolk
- North Norfolk District Council
- Great Yarmouth Borough Council

Do I need a lighting designer?

For most minor development proposals, a specialist lighting designer is not usually required. However, the advice of a lighting designer may be necessary if the project involves new, complex or multi-area lighting installations.

Specialist input is typically required for commercial developments, road lighting, sports facilities and public amenities, where specific levels of illumination must be calculated and achieved.

7. Lighting checklist

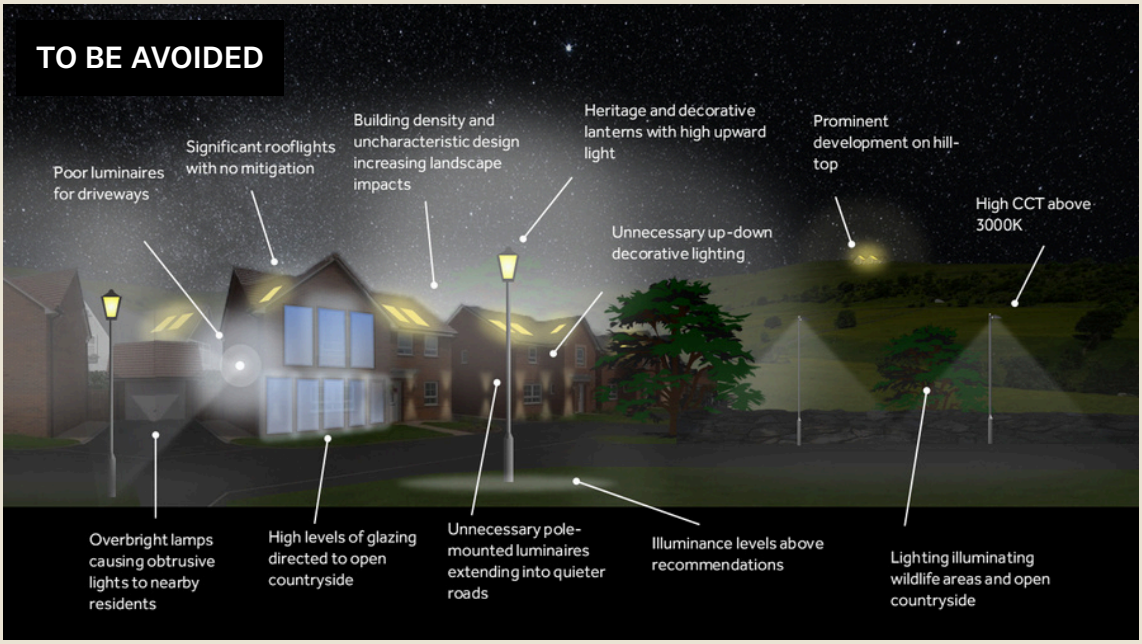
To evaluate the impact of lighting proposals on dark skies and ensure adverse effects are minimised, the following checklist should be used as a practical guide:

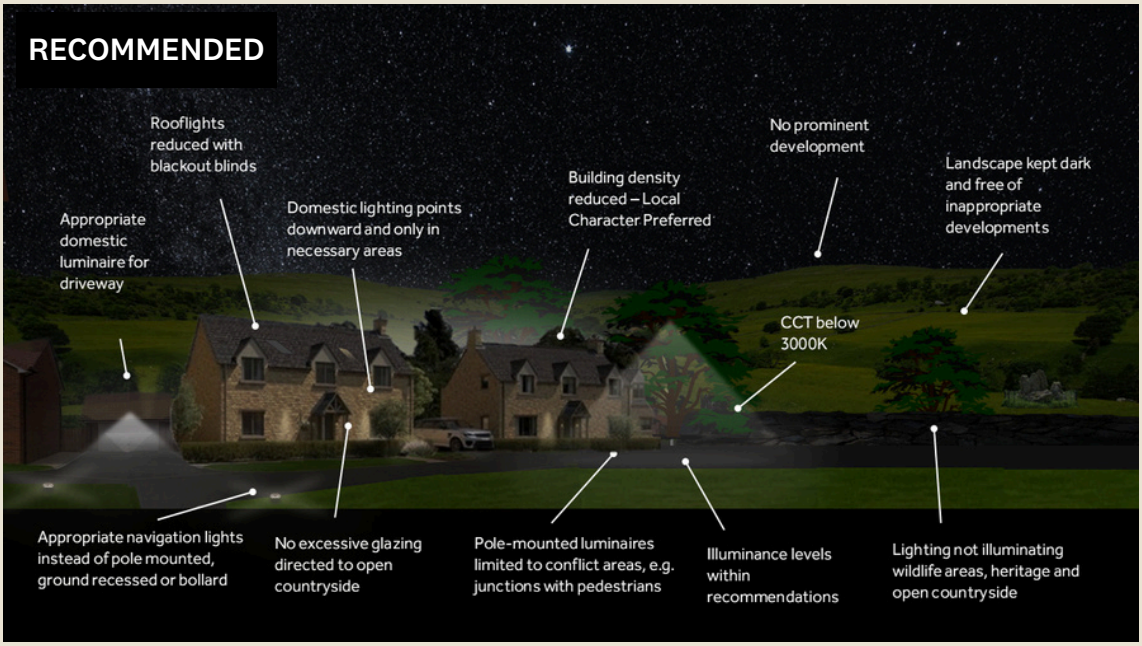
Is lighting needed?	• Has the use of external lighting been fully justified, with a clear purpose and tangible benefit? • Has unnecessary decorative or purely aesthetic lighting been avoided? • Is the proposed lighting suitable for the character of the surrounding landscape?
Lighting design & installation	• Are the lowest light levels used to achieve the required illuminanation for the task, in line with relevant standards (e.g., British Standards)? • Are fixings installed at the lowest practical height to minimise light spread? • Are fixings fully 'cut off', or are baffles/shields provided where needed to control glare and light spill?
Light direction & landscape	• Is light directed only where it is needed, avoiding spill into neighbouring areas, wildlife habitats, or the night sky? The Upward Light Ratio (ULR) should be zero for all sources. • Do the luminaire specifications demonstrate compliance, supported by images or photometric data? • Does the design ensure that light does not intrude into neighbouring spaces? • Has the impact on the local and wider landscape been considered, including: - Landscape features and existing vegetation - Sensitive nearby wildlife sites or ancient woodland - Introduction or spread of lit elements in the landscape • Has an obtrusive lighting compliance statement been submitted, following Institution of Lighting Professionals guidance?
Colour & spectrum of light	• Has the colour temperature for each luminaire been specified? Warm-coloured lighting below 3,000K should be used to minimise impacts on sky glow, wildlife, and human health. • Do the luminaires avoid 500nm wavelengths — i.e., lighting with ultraviolet or high blue spectral content?
Light controls & timing	• Has information regarding the timing/curfew for proposed lighting been submitted, including turning off lights when not needed? • Can the controls be adjusted for changes in summer and in winter, and have they been chosen to minimise adverse impact on dark skies and nocturnal wildlife? • What are the proposed methods of control, e.g. automated timer or passive infrared sensor?

8. Lighting considerations for developers

Key considerations for residential housing developments

- Size, orientation and layout of new developments should be carefully planned to minimise high-intensity lighting and reduce its visual prominence.
- Lighting and glazed surfaces should be oriented to limit light spill into the wider open landscape.
- There is no statutory requirement for UK Local Authorities to provide street lighting. Where required, new developments should follow Highways Authority guidance.
- Streetlights should ideally have a colour temperature of 2,700K (max 3,000K). Many LED amenity lighting options can achieve this while meeting Colour Rendering Index (CRI) requirements, without increasing the number of columns or significantly raising energy use.



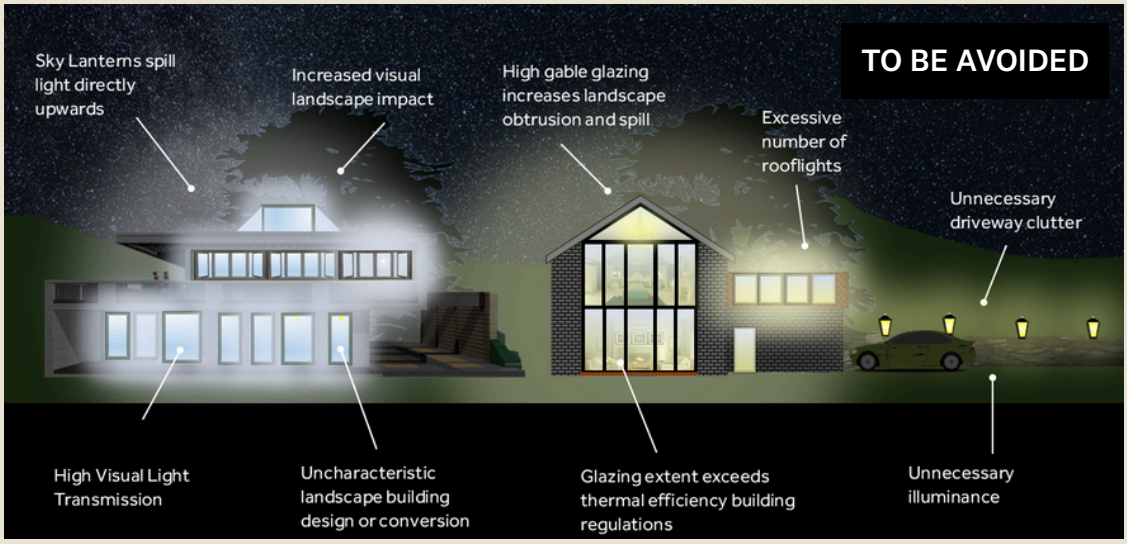


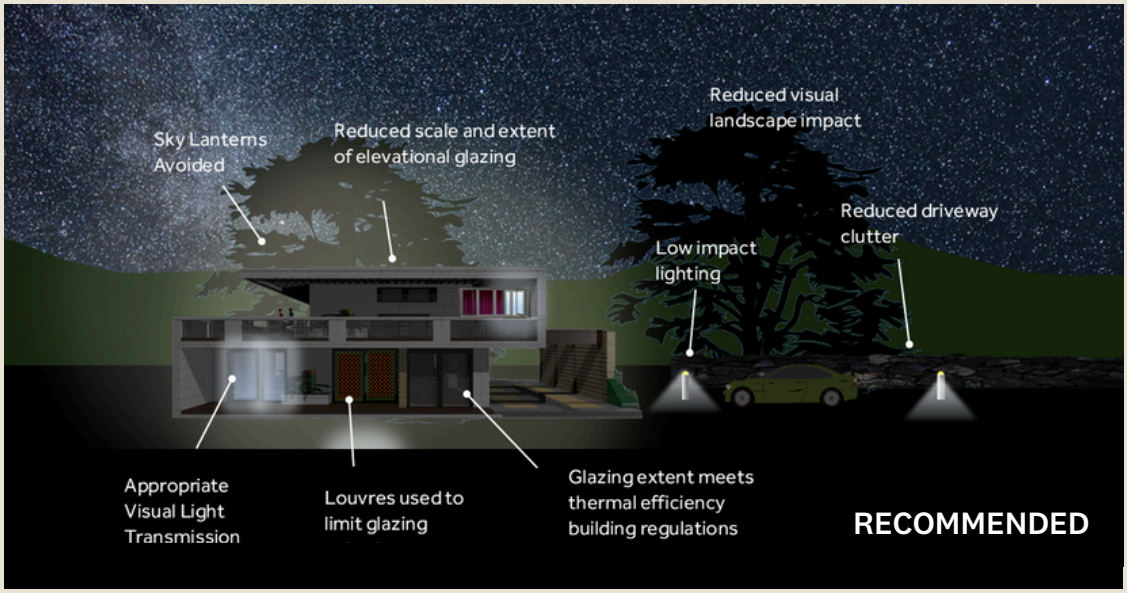
Internal light spill

Internal lighting through domestic glazing can affect the landscape more than external lighting. Excessive, poorly positioned, or upward-facing glazing (e.g. roof lights) can create obtrusive light that reduces dark skies and disrupts landscape continuity.

Design principles (in order of priority):

- Avoid excessive glazing on elevations. Large areas, especially over 50% of an elevation, are highly visible when lit internally.
- Minimise or avoid roof lights. Automated blinds can further reduce spill from roof lights but should follow other design measures.
- Use glazing with appropriate Visible Light Transmission (VLT). A VLT of ~0.65 ± 0.05 is recommended to reduce light spill.
- Ensure glazing does not exceed 25% of floor area to meet energy efficiency standards (see Part L1, Building Regulations).

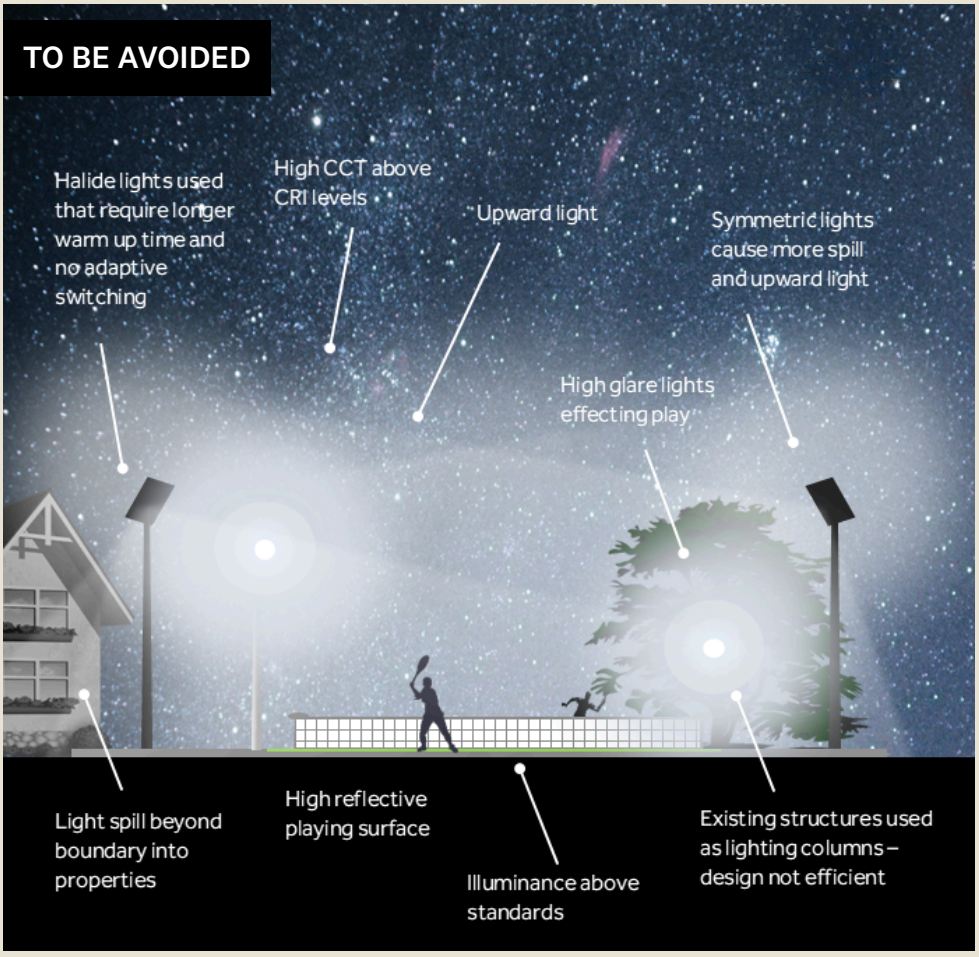


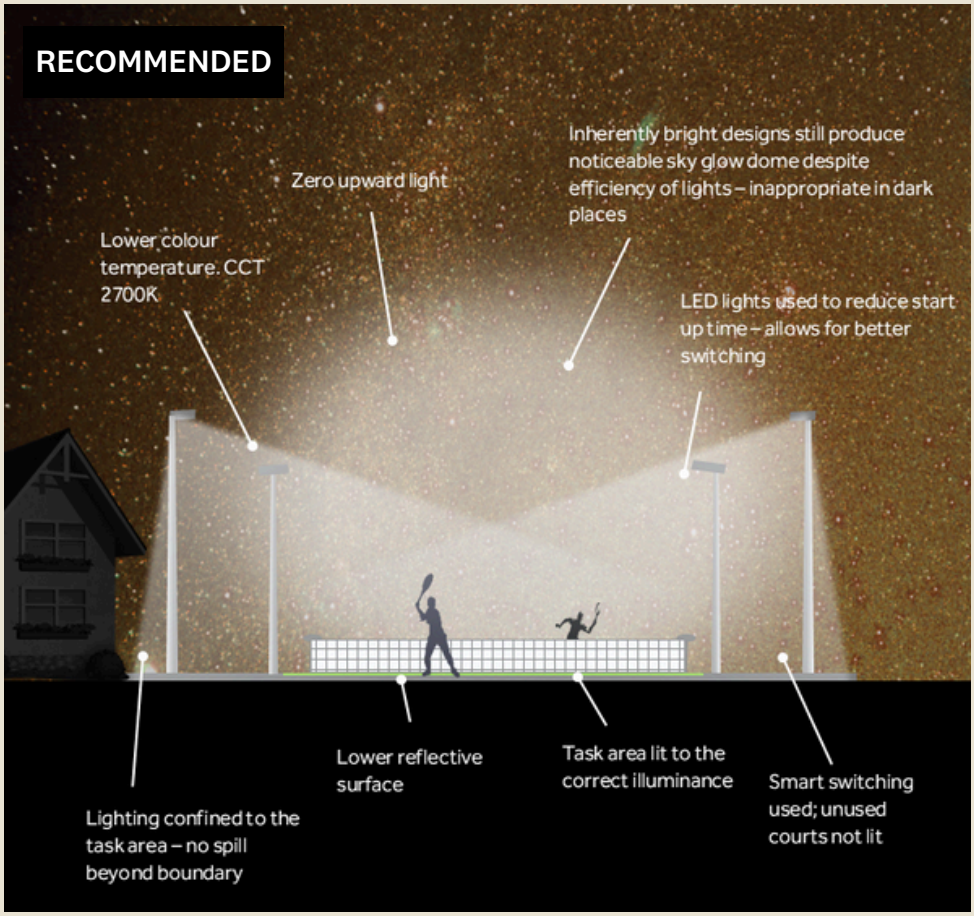


Key considerations for sports developments

Most sports developments require a lighting designer to ensure appropriate lighting and correct illuminance. Refer to the Sport England Artificial Lighting Guide (2012) for guidance.

- Minimise nuisance to nearby residences using ILP GN01 (2021) The Reduction of Obtrusive Light.
- Use asymmetric optics luminaires, installed flat and at the lowest practical height, to focus light on the playing surface and reduce upward spill.
- Choose the lowest suitable colour temperature, typically 3,000K for community-level sports.
- Keep illuminance within 10% of recommended lux values.
- Implement curfews or automatic switching to turn off lights when not needed.
- Avoid introducing intrusive lighting into dark landscapes.
- Match lighting levels to the competitive level of play.

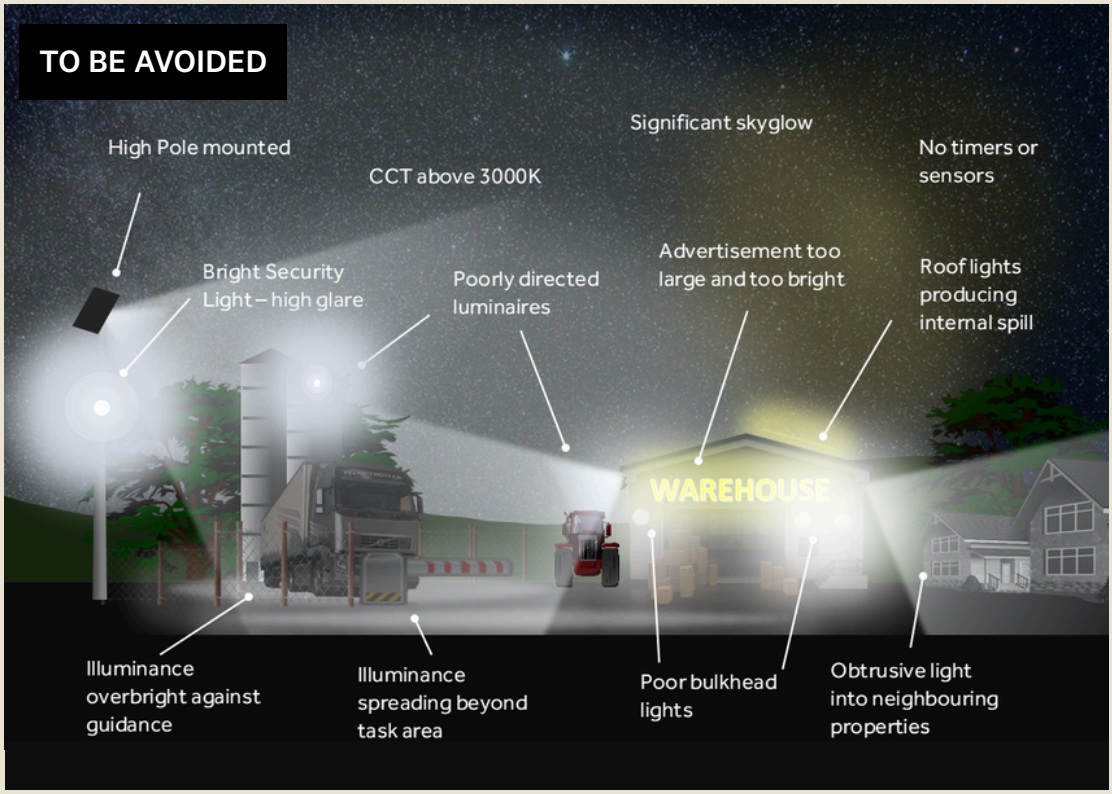


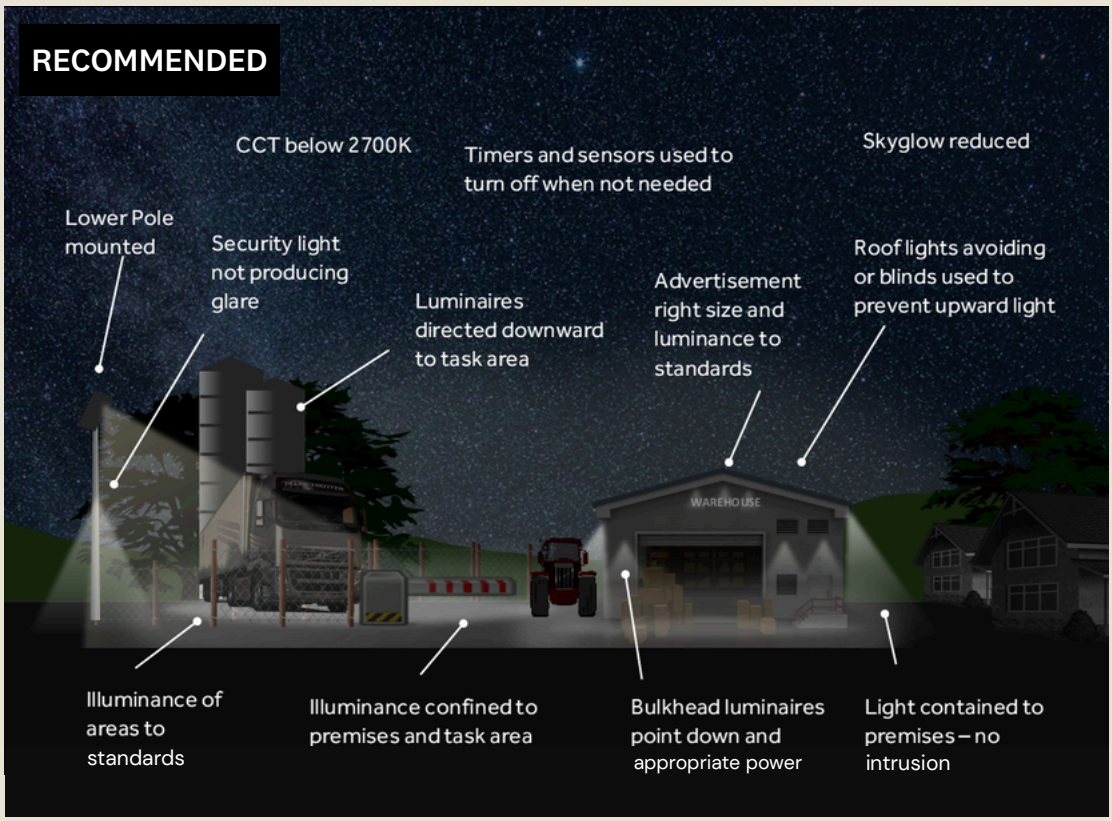


Key considerations for commercial developments

For premises with public or amenity areas — such as walkways, car parks, or potential trip hazards — a lighting designer should be consulted. The decision to engage a designer rests with the owner.

- Lighting levels: use a lighting designer to ensure illumination is appropriate. Guidance for car parks, walkways, roads, and access areas can be found in BS EN 12464-2:2024. For smaller areas with fewer lights, following this guidance is usually sufficient, provided safety concerns are met. Owners remain responsible for keeping visitors safe.
- Aesthetic lighting: avoid decorative or up-lighting unless essential for business purposes. Bright festoon lights should be avoided and all lights switched off at close of business.
- Illuminated advertisements: must comply with The Town and Country Planning (Control of Advertisements) (England) Regulations 2007. Luminance should not exceed 100 cd/m² and should ideally use a single colour on a dark background.
- Security lighting: while lighting has no direct proven effect on crime, the Police Crime Prevention Initiatives Guide provides general advice for rural business lighting.

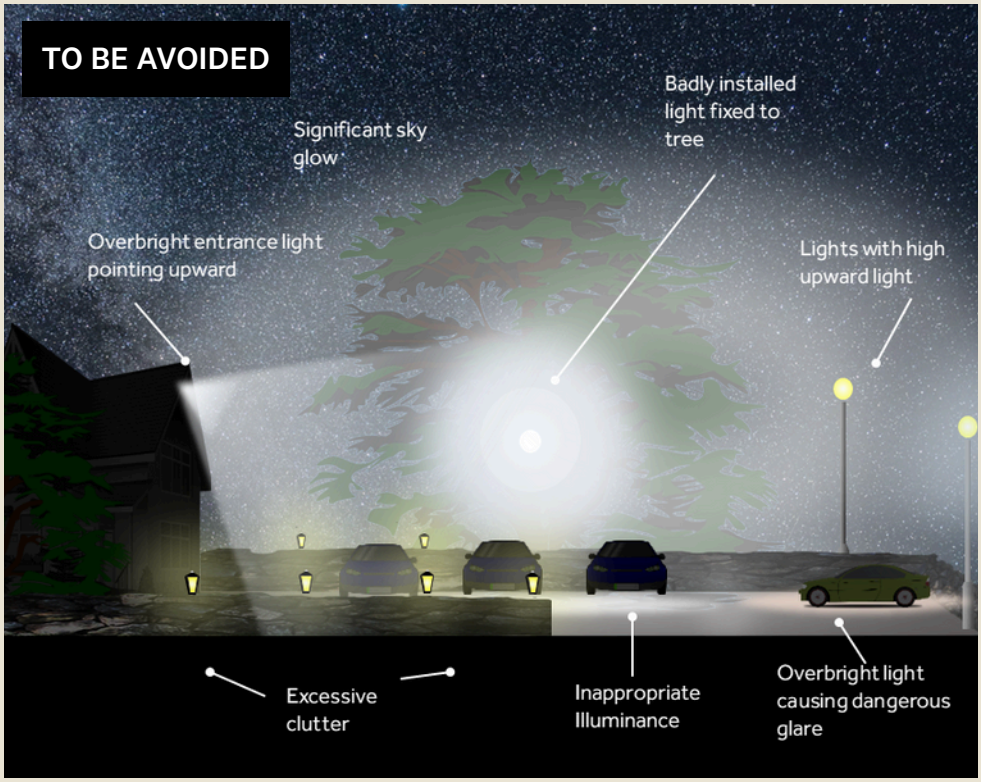

TO BE AVOIDED
High Pole mounted
CCT above 3000K
Significant skyglow
No timers or sensors
Bright Security Light – high glare
Poorly directed luminaires
Advertisement too large and too bright
Roof lights producing internal spill
WAREHOUSE
Illuminance overbright against guidance
Illuminance spreading beyond task area
Poor bulkhead lights
Obtrusive light into neighbouring properties

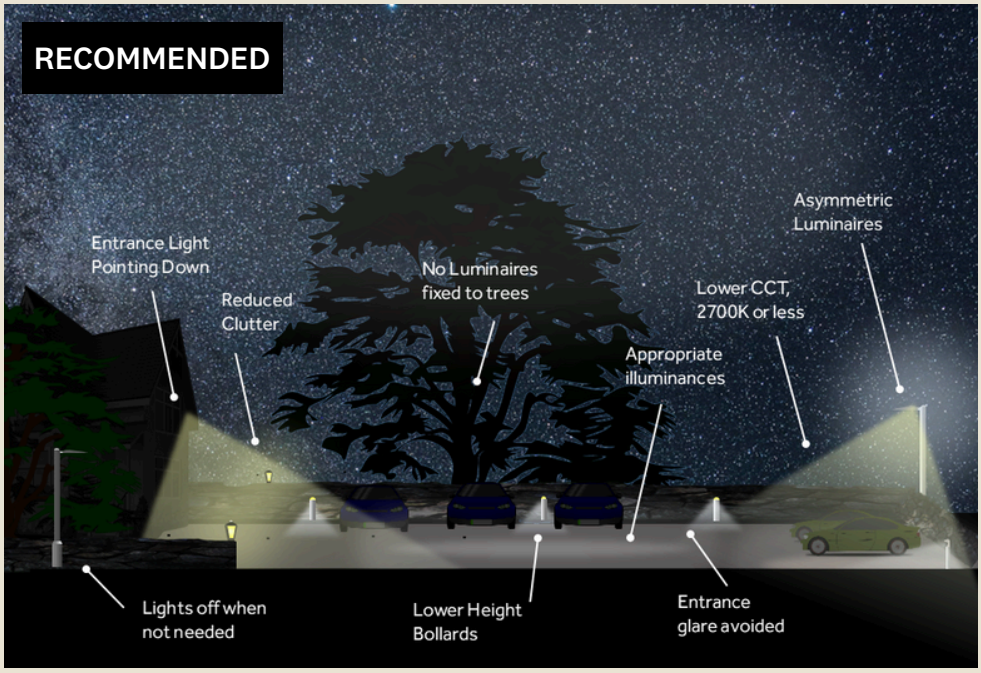

RECOMMENDED
CCT below 2700K
Timers and sensors used to turn off when not needed
Skyglow reduced
Lower Pole mounted
Security light not producing glare
Luminaires directed downward to task area
Advertisement right size and luminance to standards
Roof lights avoiding or blinds used to prevent upward light
WAREHOUSE
Illuminance of areas to standards
Illuminance confined to premises and task area
Bulkhead luminaires point down and appropriate power
Light contained to premises – no intrusion

Key considerations for car parks

Car parks should only be illuminated where there is a clear need, ideally following a risk assessment. While there is no legal requirement to use a lighting designer to meet British Standard illuminance levels, owners must ensure sufficient lighting to maintain user safety.

- Glare control: lights should be installed to minimise glare for drivers. Downward-facing fixtures with asymmetric optics are recommended.
- Appropriate illuminance: lighting levels should match the level of use to avoid overlighting.
- Alternative fixtures: low-level bollards or ground-recessed lights can provide navigation and general lighting but may be less effective over large areas and can impact nearby bats (see ILP GN08). Bollards are also susceptible to damage.
- British Standards lighting levels:
  - high usage/heavy traffic: 20 lux (e.g., large shopping centres, supermarkets, major sports complexes)
  - medium usage/medium traffic: 10 lux (e.g., department stores, office buildings, sports centres)
  - low usage/light traffic: 5 lux (e.g., small shop parking, residential parking, cycle parks)
- Controls: passive Infra-Red (PIR) sensors can ensure lights are off when not needed.
- Wildlife considerations: avoid mounting lights on nearby trees to prevent impacts on wildlife.

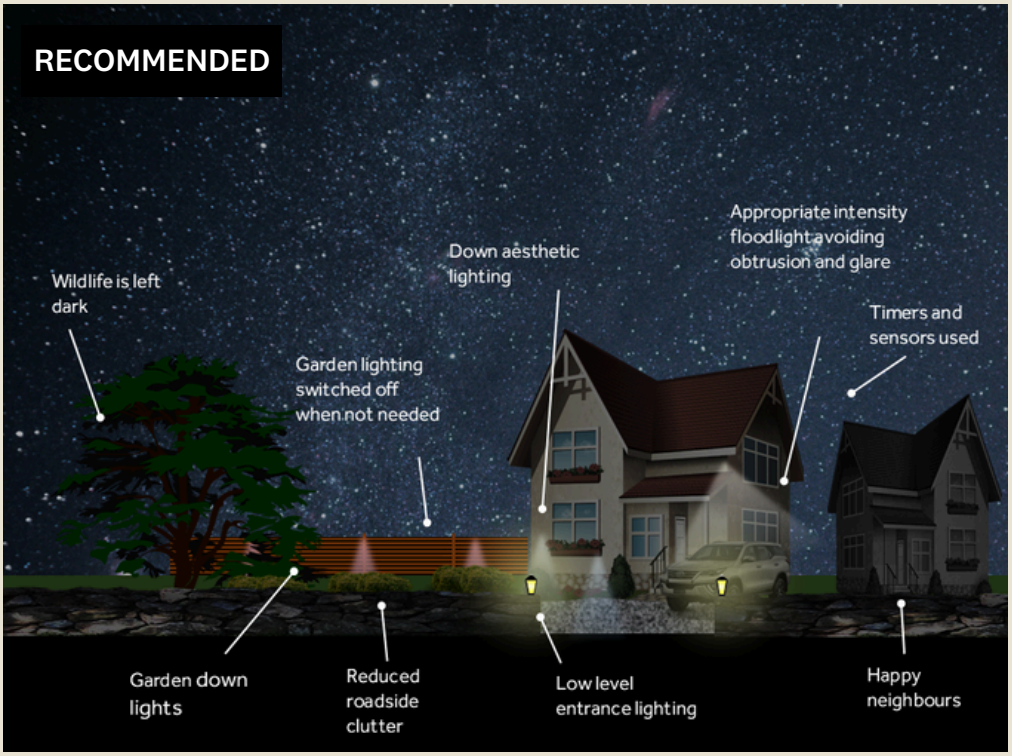

TO BE AVOIDED
Significant sky glow
Badly installed light fixed to tree
Overbright entrance light pointing upward
Lights with high upward light
Excessive clutter
Inappropriate Illuminance
Overbright light causing dangerous glare


RECOMMENDED
Entrance Light Pointing Down
Reduced Clutter
No Luminaires fixed to trees
Asymmetric Luminaires
Lower CCT, 2700K or less
Appropriate illuminances
Lights off when not needed
Lower Height Bollards
Entrance glare avoided

Key considerations for domestic lighting

Domestic lighting is generally not subject to planning control, provided it is minor and does not require additional engineering infrastructure.

- Neighbours: Poorly installed lighting can cause nuisance. Use lights under 1,000 lumens (ideally 500), point them downward and away from neighbouring properties, and consider proximity sensors to switch them off when not needed.
- Overlighting: Many domestic lights are brighter than necessary. Most homes require 500–1,000 lumens; rarely more than 1,500. For context, residential streetlights operate at ~3,000 lumens at 5 m height.
- Aesthetic lighting: Adopt a 'less-is-more' approach. Exterior or mood lighting is most effective when visible and uncluttered.
- Wildlife: Avoid uplighting trees, especially with lights over 500 lumens. If necessary, use red-coloured lights and turn them off when not needed, or install proximity sensors.



9. Key words

Colour Correlated Temperature (CCT)	A gauge of how yellow or blue the colour of light from a light bulb appears, measured in the unit 'Kelvin'.
Colour Rendering Index (CRI)	A quantitative measure of the ability of a light source to reveal the true colour of objects in comparison with a natural light source.
Illuminance	A quantity of how much light falls upon a surface. It is measured in lux (lx), or equivalently in lumens per square metre.
Light-emitting diode (LED)	A semiconductor diode that emits light when a voltage is applied to it and that is used especially in electronic devices (as for an indicator light).
Light baffle (or louvre)	A component in a light fixture designed to minimise glare by directing light through a textured surface.
Lumen (or luminous flux)	A unit of measurement that indicates how bright a light source is.
Luminaire	An electrical device that contains a light source and is used to provide artificial lighting in a specific area or space.
Luminance	A measure of how bright light appears to the human eye.
Milky Way	The galaxy that includes the earth, seen at night as a pale strip across the sky.
Passive infrared sensor (PIR)	An electronic sensor that can switch on light when movement is detected.
Photometry	The science of measuring visible light in terms of its perceived brightness to the human eye.
Photosynthesis	The process by which plants change the energy in sunlight to kinds of energy that can be stored for later use.
Upward Light Ratio (ULR)	A measurement of the percentage of light emitted upwards from a luminaire. It is recommended that the ULR be zero in developments.

10. Further reading

- **Bats and artificial lighting in the UK**
  Bat Conservation Trust and Institution of Lighting Professionals

- **Lighting of work places - Outdoor work places: BS EN 12464-2:2024**
  British Standards Institution

- **Lighting at Work HGS38**
  Health and Safety Executive

- **GN01/21 The Reduction of Obtrusive Light**
  Institution of Lighting Professionals

- **Design Guidance Note: Artificial Sports Lighting**
  Sport England

- **Towards a Dark Sky Standard**
  UK Dark Skies Partnership

- **Clean Neighbourhoods and Environment Act 2005 – Statutory Nuisance: lighting**
  UK Government

- **Illuminated Adverts Regulations**
  UK Government

Find out more

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