AIRPORT OPERATORS ASSOCIATION
IN ASSOCIATION WITH
CIVIL AVIATION AUTHORITY

# Safeguarding of Aerodromes

# Advice Note 2

# Lighting near Aerodromes

## 1. Introduction

Aerodrome safeguarding aims to ensure the safety of all aircraft in the vicinity of an aerodrome by controlling potentially hazardous developments and activities around it. This Advice Note 2 considers in particular the control of the location, heights, brightness, type and pattern of lights around the aerodrome, with an overall caveat that "no light" should be directed or pointed towards any aircraft.

At night and in periods of poor visibility during the day, pilots rely on the particular pattern of aeronautical ground lights, principally the approach & runway lights, to assist in aligning themselves with the runway and to land at the correct point. Various types of lighting have potential to cause issues for example:

- Temporary lighting (e.g. construction lighting, light shows, temporary installations)
- Advertisements (e.g. display screens, lit hoardings)
- Lighting of buildings and other structures (e.g. art installations)
- Street lighting
- Flood lighting (e.g. sporting venues, car parks, distribution centres)

Lighting should not be displayed which could distract pilots or confuse them by being mistaken for aeronautical ground lights.

***Figure 1.*** *Aeronautical ground lights (approach & runway lights) as seen by the pilot on approach to land at a major aerodrome*

Further details with regard to the design of lighting in the vicinity of aerodromes can be found in British Standard BS 5489 'Code of Practice for the Design of Road Lighting'. This guidance may also be applied to lighting other than road lighting.

## 2. Aerodrome Safeguarding Considerations

As a general rule the closer the site is to the aerodrome the more restrictions that are applied on proposed lighting. There is a 'Lighting Box' around some aerodromes where lighting is most restricted, see example below.

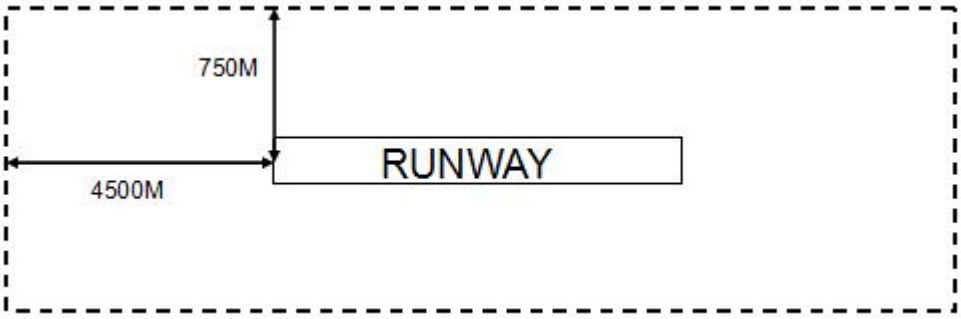


***Figure 2.*** *A typical lighting protection area for an instrument approach runway*

The size of the 'Lighting Box' may vary between aerodromes. Please contact the aerodrome concerned for further details.

In particular, when proposing both temporary, including construction and permanent lighting in the vicinity of an Aerodrome, the following need to be taken into consideration:

- Any aeronautical ground lighting is not obscured from the pilot's view. (See Para 2.1).
- Any proposed lighting cannot be confused with aeronautical lighting, for example replicating the same patters or colours (See Para 2.2).
- Any proposed development must not contain a high level of background lighting which could diminish the effectiveness of aeronautical lighting (See Para 2.2).
- Any proposed lighting must not have the potential for glare or dazzle to pilots (See Para 2.3 & 3).
- Any proposed lighting must not infringe the Obstacle Limitation Surfaces (OLS) for the aerodrome (See Para 4.0 and Advice Note 1, Para 5.1).

### 2.1 Not Obscuring Aeronautical Ground Lighting

Proposed structures and landscaping must not obscure any aeronautical ground lighting including runway approach lights. A clear view of all lighting patterns must be maintained at all times. In the case of approach lights an area 120m wide extending up to 1,350m from the runway threshold should be free of objects which might obscure or distort the lighting pattern. The pilot sees the aerodrome lighting in perspective, never in plan and has to interpret the guidance provided, while travelling at high speed.

If you are proposing lighting close to the aerodrome under the approach and take off paths, you are advised to contact the aerodrome operator to ensure that aeronautical ground lighting and approach lighting will not be obscured.

### 2.2 Confusing Lighting

To avoid confusion with aeronautical ground lights, it is recommend that any proposed lights, especially street and car park lighting are full cut off and mounted horizontally so that light is not emitted above the horizontal.

Any developments, especially those close to the approach & take off surfaces must not display high levels of lighting. It is essential for pilots that aeronautical ground lighting, including the approach lighting, stands out to enable them to assess the lighting pattern, particularly in low visibility.

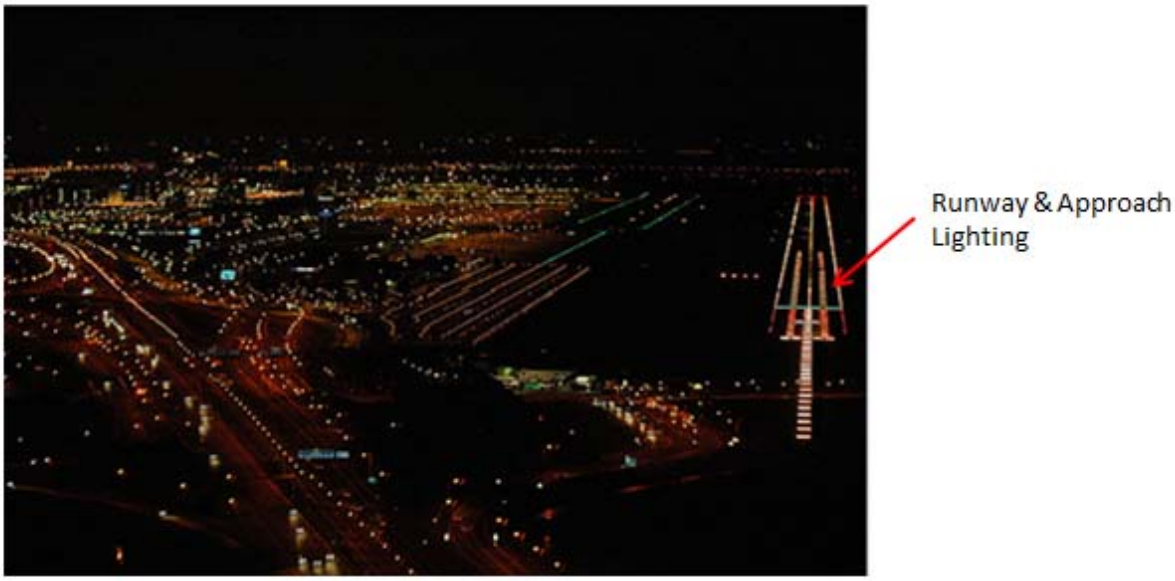


***Figure 3.*** *An Example of Confusing Lighting*

For lighting schemes near an aerodrome it is recommended that the use of red, white and green lights should be avoided where possible.


***Figure 4.*** *Five strip lights which are causing confusion within the runway approach lights*

### 2.3 Potential Glare or Dazzle

No strobe lighting, laser or flashing light should be included in a lighting scheme on the aerodrome or within the following areas as defined in Civil Aviation Authority (CAA) Publication CAP736, "Operation of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Airspace" – available from the CAA website at www.caa.co.uk

- Within three nautical miles of an aerodromes notified Aerodrome Reference Point (ARP) or similar
- Or within ten nautical miles of the notified ARP along the track of the extended runway centreline and 500 metres either side of said centreline

The aerodrome will assess each application against its location and potential to cause interference with aeronautical ground lighting.

### 2.4 Height Limitations for Lighting Structures

Lighting columns and masts must not infringe the Obstacle Limitation Surfaces (OLS) around aerodromes. Therefore it is important that accurate height details of any proposed lighting installation is included with any planning application or pre application enquiry. See Advice Note 1 'Aerodrome Safeguarding an Overview' for further details.

## 3.0 Outdoor Light shows involving Lasers, Searchlights & Fireworks

No light or airborne object should be directed or pointed towards any aircraft. The use of lasers, searchlights, fireworks, helium filled toy balloons and sky lanterns has the potential to impact upon aviation safety.

Lasers and searchlights make use of a generated light source to produce intense and directional beams of light. These can dazzle pilots and have been proven to cause damage to the human eye or induce medical conditions which impact pilot capability. Fireworks could distract and confuse pilots and cause damage to aircraft in flight.

Helium filled toy balloons and sky lanterns have the potential of causing damage to aircraft engines through ingestion. Additionally, debris from sky lanterns dropping to the ground could create Foreign Object Debris (FOD), which could cause damage to aircraft if any remnants land on an airfield. The risk to aviation is increased when such activities take place in the vicinity of aerodromes, particularly during those crucial take-off and landing phases of flight.

Any temporary outdoor displays involving any of the above in the vicinity of an aerodrome should be notified to the CAA and the aerodrome concerned. Guidance is in CAP 736

## 4.0 Obstacle Lighting

Warning lights on obstacles are intended to visually indicate the presence of hazards to aircraft operating at low level. This applies particularly during take-off and landing at night and in poor daylight visibility. The aerodrome safeguarding process will determine whether a proposed development needs obstacle lights to be fitted. This is also applicable to temporary obstacles such as cranes as well as to permanent structures.

For further information regarding obstacle lighting for cranes please refer to Advice Note 4 'Cranes & Other Construction Issues'.

Where it is deemed necessary that obstacle lights(s) would be required it should preferably be agreed before planning permission is granted. Alternatively it may be agreed by a condition that can be attached to the planning permission. The condition should state the characteristics of the light(s) required. For further information please refer to the CAA website at www.caa.co.uk

## 5.0 Anemometer Masts and Other Narrow Profile Structures

Anemometer masts should be assessed on a case by case basis in relation to obstacle lighting, individual cases should not set a precedent for future requests.

Anemometer masts and/or their guywires should be equipped with aids to increase their daytime visibility where a risk based proposal demonstrates a specific need. Such measures may include appropriately placed obstacle lights or other markers such as orange marker buoys.

For further information please refer to Advice Note 5 'Renewable Energy & Impacts on Aviation'.

## 6.0 Air Navigation Order (ANO)

Should any light, once installed, be reported as dangerous or confusing, then there are provisions under the ANO which direct that *'lights shall not be exhibited which are liable to endanger aircraft taking off from or landing at an aerodrome, which are liable to be mistaken for an aeronautical light'*. In addition, there is a provision which states that nobody should damage or interfere with any aeronautical ground light.

Owners of lights must always comply with any notice that may be issued under the ANO to dim or extinguish lights, pending resolution of any problems that arise when the lights are in use.

For further details contact the aerodrome operator.

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**The Advice Notes in this series are:**

- **Advice Note 1 'Aerodrome Safeguarding an Overview'**
- **Advice Note 2 'Lighting Near Aerodromes'**
- **Advice Note 3 'Wildlife Hazards around Aerodromes'**
- **Advice Note 4 'Cranes & Other Construction Issues'**
- **Advice Note 5 'Renewable Energy & the Impact on Aviation'.**

**The Advice Notes are all available from the Airport Operators Association (AOA) at [www.aoa.org.uk](http://www.aoa.org.uk)**