Date:	April 2024
Ref.:	Advice Note 2
Subject:	Lighting Near Aerodromes
Action required:	For Information

1. Introduction

Aerodrome safeguarding ensures the safety of aircraft and their occupants when in the vicinity of an aerodrome by controlling potentially hazardous development and activity around it. For an overview of the safeguarding process see Advice Note 1 'Aerodrome Safeguarding – An Overview', available at CAST publications | Civil Aviation Authority (caa.co.uk).

This advice note considers the location, height, 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, pilots rely on the pattern of aeronautical ground lights, principally the approach and runway lights, to assist in aligning themselves with the runway and to land at the correct point.

Various types of lighting have the potential to cause issues for example:

- Temporary lighting, e.g. construction lighting, light shows, temporary installations
- Advertisements
- Lighting of buildings and other structures
- Street and car park lighting
- Flood lighting at sporting venues or similar including special events in temporary locations

No lighting should be displayed which could distract pilots or confuse them by being mistaken for aeronautical ground lights.

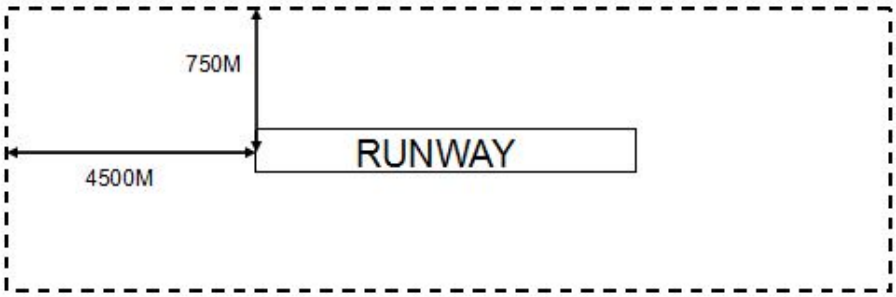
Further details with regard to the design of lighting in the vicinity of aerodromes can be found in British Standard BS 5489 'Code of Practice for the Design of Road Lighting'.

This guidance should also be applied to lighting other than road lighting in the vicinity of an aerodrome. Section 12 of BS 5489, includes the following:

- It is essential to eliminate interference with the pilot's visual picture and with RVR equipment, and road lighting in the vicinity of aerodromes should be designed to achieve this.
- On those roads agreed with the aerodrome operator as having potential for causing such hazards, the luminaires used should conform to the installed intensity requirements of BS EN 13201-2:2003, class G4, or a higher class.

2. Aerodrome Safeguarding Considerations

As a 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.



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.

AERODROME SAFEGUARDING ADVICE NOTE

A full set of approach and runway lights as seen by the pilot on approach

When proposing any lighting in the vicinity of an aerodrome, whether temporary, including construction or permanent the following must be taken into consideration:

- Any aeronautical ground lighting is not obscured from the pilot's view (see section 2.1).
- Any proposed lighting cannot be confused with aeronautical lighting, for example replicating the same patterns or colours (see section 2.2).
- Any proposed development must not contain a high level of background lighting which could diminish the effectiveness of aeronautical lighting (see section 2.2).
- Any proposed lighting must not have the potential for glare or dazzle to pilots (see sections 2.3 and 3).
- Any proposed lighting must not infringe the Obstacle Limitation Surfaces (OLS) or any protected surfaces around the aerodrome (see section 2.4). For more information refer to Advice Note 1 'Aerodrome Safeguarding an Overview', available at CAST publications | Civil Aviation Authority (caa.co.uk).

2.1 Not Obscuring Aeronautical Ground Lighting

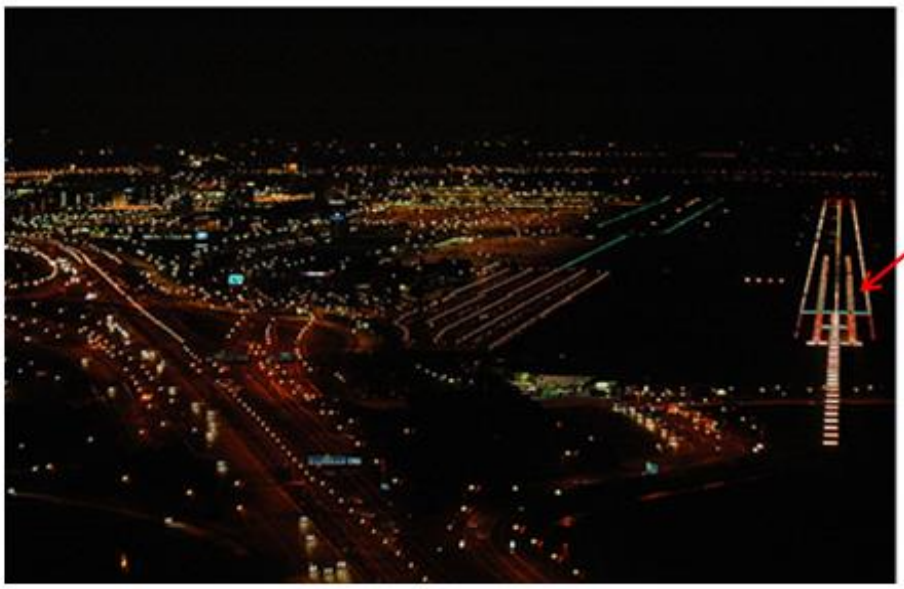
Proposed structures and landscaping must not obscure any aeronautical ground lighting including approach lights. A clear view of all lighting patterns must be maintained. In the case of approach lights an area 120m wide extending up to 1,350m from the runway threshold should be free of objects which might obscure or distort the lighting pattern.

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 recommended that any proposed lighting schemes, especially street and car park lighting are fully cut off and mounted horizontally so that light is not emitted above the horizontal.

Any developments, especially those close to the approach and 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.



An Example of Confusing Lighting

Five strip lights which are causing confusion with the approach lights

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

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 CAA Publication 'CAP 736: Operation of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Airspace', available 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) and other protected surfaces around aerodromes. Therefore, it is important that accurate height details of any proposed lighting installation are included with any planning application or pre application enquiry. See Advice Note 1 'Aerodrome Safeguarding an Overview' for further details available at CAST publications | Civil Aviation Authority (caa.co.uk).

3. Outdoor Light Shows involving Lasers, Searchlights and 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 produce Foreign Object Debris (FOD), which could cause damage to aircraft should 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 phases of flight associated with take-off and landing.

Any temporary outdoor display involving any of the above in the vicinity of an aerodrome should be notified to the CAA and the aerodrome concerned. Guidance can be found in CAA Publication 'CAP 736: Operations of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Airspace' available at www.caa.co.uk.

4. 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 with regard to the lighting of obstacles please refer to CAA Publication 'CAP 1096: Guidance to Crane Users and Notification', 'CAP 738: Safeguarding of Aerodromes' and 'CAP 168: Licensing of Aerodromes' and 'Aerodromes - UK Regulation (EU) 139/2014' all available at www.caa.co.uk or contact the aerodrome operator.

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.

5. 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 CAA Publication 'CAP 168: Licensing of Aerodromes' and 'Aerodromes - UK Regulation (EU) 139/2014' available at www.caa.co.uk or contact the aerodrome operator.

6. 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.

Further details can be found in CAA Publication 'CAP 393: Regulations made under powers in the Civil Aviation Act 1982 and the Air Navigation Order 2016' and in 'Aerodromes – UK Regulation (EU) 139/2014', available at www.caa.co.uk.

This advice note has been revised and updated by the Combined Aerodrome Safeguarding Team (CAST) from that produced by the Airport Operators Association (Safeguarding Working Group) with the support of the CAA. Its contents may be reproduced as long as the source is acknowledged.

Further CAST Safeguarding Information is available at https://www.caa.co.uk/combined-aerodrome-safeguarding-team-cast/.