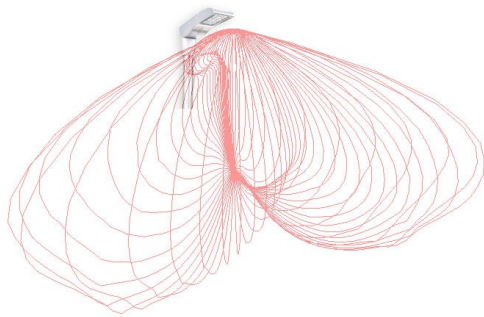


GUIDE FOR PUBLIC REALM LIGHTING LAYOUTS

Public Realm Lighting Principals and Electrical Supplies



Survey &
Evaluation

Proposals &
Concept

Design &
Detail

Automation &
Controls

1. Public Realm Beautification Principals.

This guide, cannot cover everything as some sites may have specific needs, but this document is designed to offer some minimum guidance and assistance or general consideration

Lighting in the Public Realm quite commonly is in conflict between:

- ◇ Architects. That prefer targeted lighting with aesthetics at the forefront.
- ◇ Local Authority (LA) engineers. Who predominantly consider lighting for safety only, with uniformity.

Some typical Architect views

- ◆ Aesthetic over safety
- ◆ Achieving Aesthetic using custom products not in the maintenance schedules
- ◆ Electrical connectivity,
- ◆ Needs to understand public funding reserved for safety
- ◆ Understand commuted sums and spares for maintenance With special maintenance requirements outside the Highways Electrical Association (HEA)
- ◆ Design Manual for Roads and Bridges (DMRB) construction Series and maintenance contract items

An Example.

Lighting of a Public Garden and Statue.

The Right Light, In the Right Place , At the Right time, with the Right Controls

The Do's

- ◆ Balance the requirements for safety lighting and amenity feature lighting based on public maintenance budgets.
- ◆ Consider the DNO electrical supply location. It may be located and terminated within a feeder pillar.
- ◆ Place lighting and projectors from posts if possible. This keeps the electrical supplies out of public access, this reduces vandalism.
- ◆ Use lighting that can be hidden within the architecture, where the feature must be highlighted.
- ◆ Consider a background ambient light level, meeting a lighting class, then use feature lighting as an addition to punch through highlighting features. Then check to make sure its not over lit.
- ◆ Consider Obtrusive light and curfew times, together with existing authority controlled lighting.
- ◆ Consider connectivity to a Central Management System (CMS) system

The Don'ts

- ◆ Avoid Lighting from areas subject to vandalism.
- ◆ Avoid if possible in ground electrical connections.
- ◆ Use lighting that can be hidden within the architecture, where the feature must be highlighted.
- ◆ Consider a background ambient light level, meeting a lighting class, then use feature lighting as an addition to punch through highlighting features. Then check to make sure its not over lit.
- ◆ Consider Obtrusive light and curfew times, together with existing authority controlled lighting.



2. DMRB and Maintenance Contracts

Any Public Realm lighting, requires co-operation between the Architect and principal stakeholders on one side and the Local Authority engineer on the other.

The aesthetic appearance and inclusivity of a space is essential to attract people to use the space and benefit the surrounding area and businesses, therefore in cases, strong lighting effects using white, or coloured lighting effects may be used. But.

If the placement is in the public arena, the public funds for maintenance of drainage, paving and lighting may become under control of the Highways Engineer.

The engineers have control of a strict public funded budget to maintain and improve lighting, so work with contract costs agreed with specific manufacturers and highway contractors, mainly concerned with safety costs only.

Beatification generally falls outside this agreed contract, therefore custom agreements, including maintenance spares etc affect how an agreement is made.

3. Product Selection

Any product selected will be required to be resistant to weather conditions and impact resistance.

Ingress protection (IP Ratings taken from BS EN60529) will need to meet the highest requirements, and possibly a number of them based on the differing test conditions.

This may mean IP66, and also IP67, where IP68 may need to be further defined for submersion in fountains for example.

In the exterior environment Lamps of lower colour temperatures have been shown to be beneficial for flora and fauna

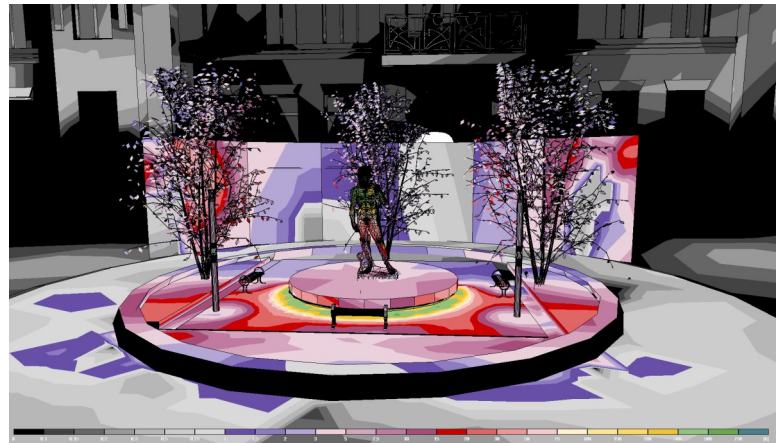
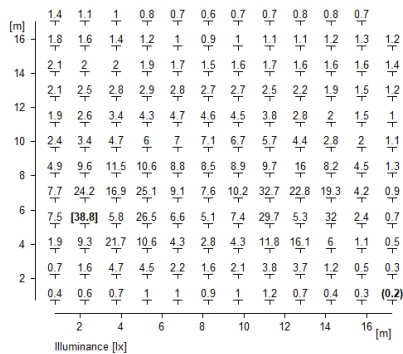
4. Recommendations

Good effects can be achieved using a minimum palate of products but each project is specific and needs its own individual approach. Obtrusive and Intrusive light assessments may be needed to satisfy environmental concerns



4. Recommendations (Cont.).

Evidence of performance and / or modelling effects will be required in both the horizontal and vertical planes, where the performance achieved considers the population density and the built environment in which the development may sit. The population density gives rise to Environmental Zones where obtrusive light limitations, and also limitation to Skyglow exist.



5. Environmental Zones

Based on scientific study, limitations exist on light emission based on population density and background illumination. Such limitations are present for hours of darkness prior to late evening (pre-curfew), and those of late evening into early morning (Post-curfew)

These environmental zones are described as follows:

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

6. Obtrusive Light

Obtrusive light covers aspects that considers light performance and intensity through window, on patio areas or other similar areas where light may affect the enjoyment of that space.

In addition recent changes also include the effects of skyglow from shallow angle luminaires.

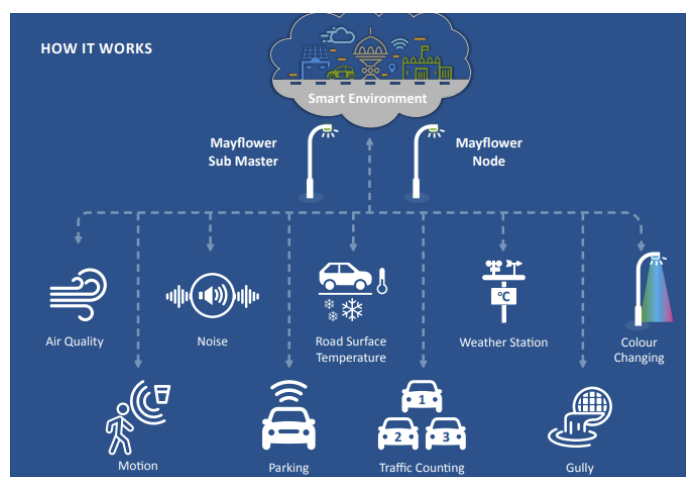
Accurate modelling in specific software is required to enable analysis of such effects.

For detailed information, please refer to the specific guidance document related to this subject provided on the website and in published documentation.

7. CMS Controls

For the Public Realm, it is more common that Local Authorities are using Centrally Managed Systems or (CMS). These are generally wireless systems using a node or master to control many luminaires.

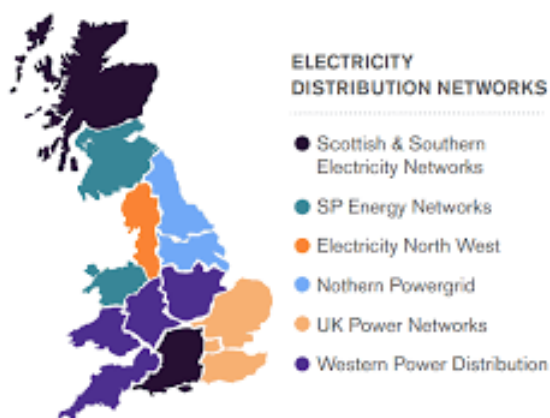
The technology may allow an adaptive lighting approach to roads, and increase levels where high crime occurs



Variations on such systems exist, so compatibility must be checked in advance of procurement of items. Connectivity to such a system allows the authority the means to oversee and maintain operation while in a safe environment to the benefit of the local community

8. Electrical

Electrically, due to public budget controls it is unlikely, that such beautification would be connected directly to an unmetered supply provided by the DNO (district electrical provider). Reasons include operation usage codes required for energy, and CO² carbon offset. Instead, it may be agreed to provide an unmetered lighting point within maybe a feeder pillar, and then a metered distribution Private Cable Network (PCN) to lighting points.



Typical image for feeder pillar to a PCN