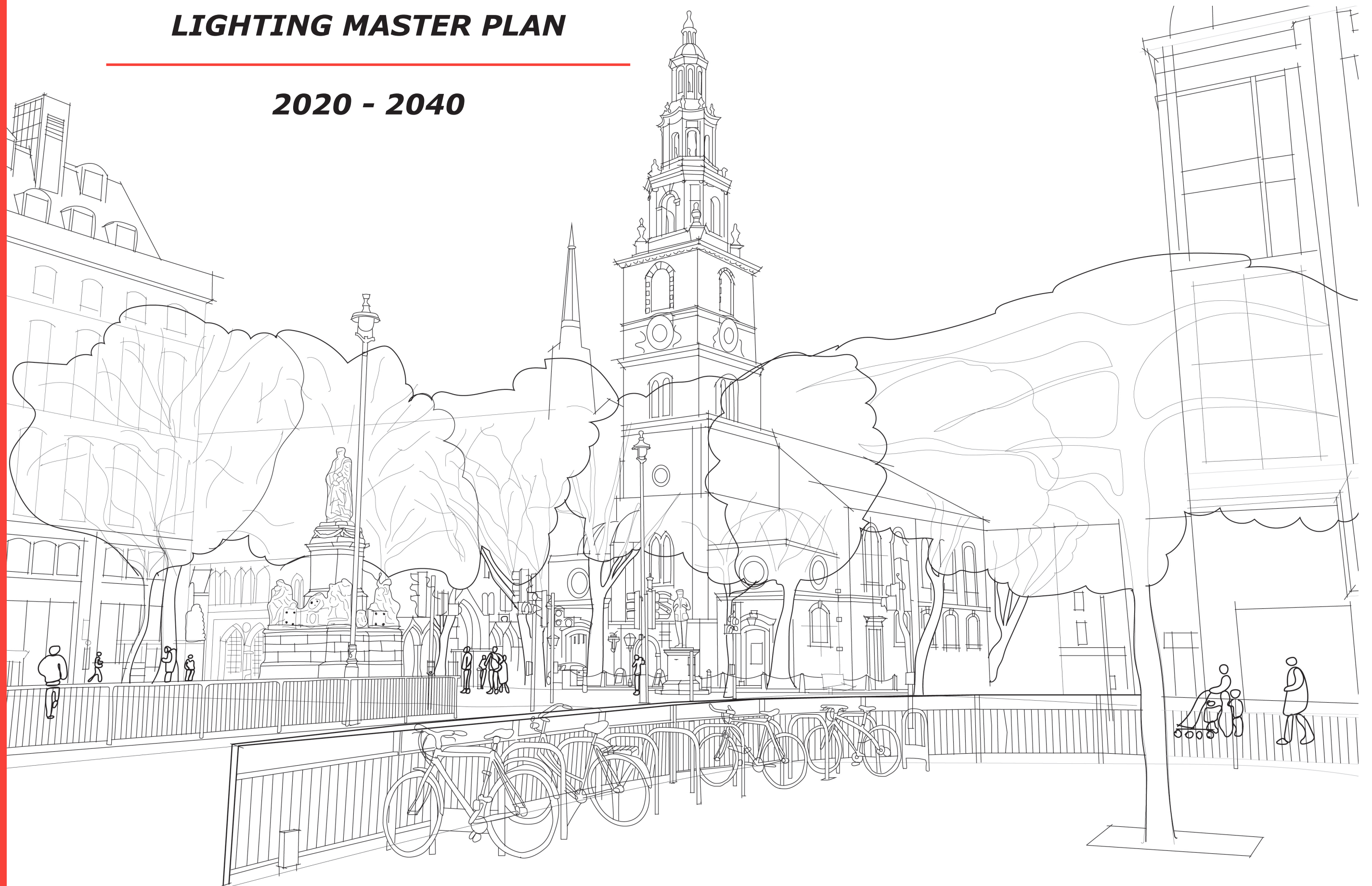


# ***LIGHTING MASTER PLAN***

**2020 - 2040**



City of Westminster

## FOREWARD

Westminster City's Lighting Master Plan 2020-2040, sits under our City Plan 2020-2040 which sets out an ambitious strategy to make Westminster one of the best places to live, work, play and visit.



The Lighting Master Plan supports the ambitions of the City Plan by laying down a strategic approach to manage the use of artificial light across the city. Getting the approach right through a co-ordinated use of artificial lighting supports our night-time economy and enhances the environment for residents, tourists, workers and businesses alike.

Lighting can highlight, reveal and enhance the city's night-time character, identity and celebrate its unique heritage, history, cosmopolitan environment and provide a sense of place.

We need light to see, and artificial lighting has become an essential part of modern life. It helps to provide a safe environment for a range of activities such as driving, cycling, walking and sports. It can also enhance the environment by means of decorative and flood lighting of areas, features and buildings.

As well as ensuring that people can move around the city safely, supporting our night-time and evening economy and improving the appearance of the city it is important that our use of artificial light supports Westminster's environmental ambitions. The Master Plan seeks to support the reduction of energy usage and the impact of light pollution on people and wildlife.

Innovation plays an important part and careful consideration of how we adopt new light sources, control systems and lighting techniques will support this.

The Lighting Master Plan contributes to our commitment to improve the health and wellbeing of the city's residents and works to help ensure that Westminster is a place we can be proud to hand to our successors.

**Councillor Andrew Smith**

Cabinet Member for Environment & Highways  
Westminster City Council



## HOW TO USE THIS PLAN

The Lighting Master Plan sits under our statutory development City Plan 2019-2040. It sets out the council's strategy for the development and application of artificial lighting considering daytime aesthetics as well as night time performance. The master plan will be used in establishing the application of artificial light for all purposes and in the determination of planning applications.

You should use this Lighting Master Plan if you are considering assessing, designing or commenting on any aspect of artificial light within the City of Westminster.

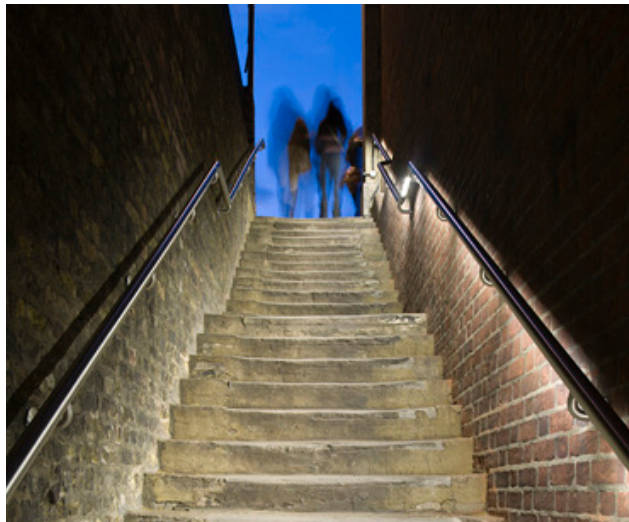
Westminster City Council also produces supplementary guidance documents which are published on our website and provide more detailed guidance on the application, design and operation of artificial light within the city. These should be consulted when considering any lighting design.



**Image 1: Victoria Embankment**

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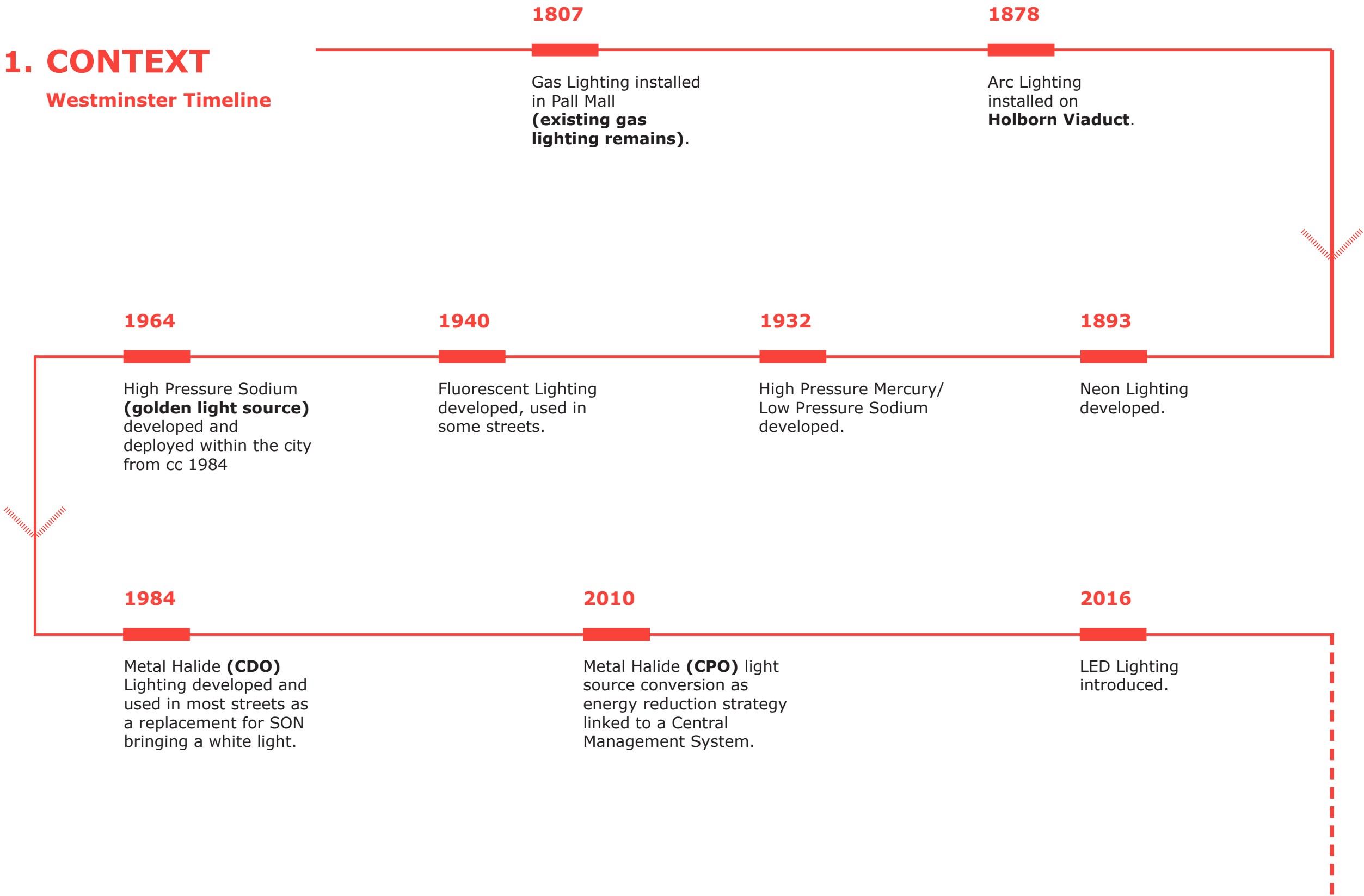




**Figure 1: St Clements Danes Church, Artistic Impression**



1. CONTEXT  
Westminster Timeline

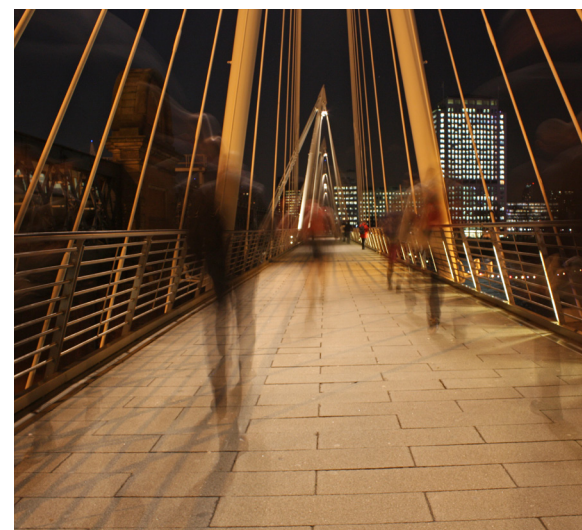


Flowchart 1: Westminster Timeline

The Lighting Master Plan is a guidance document which sets out our artificial lighting strategy for the city. The purpose of the Lighting Master Plan is to provide an overarching cohesive vision for lighting across the City of Westminster, enhancing perception in terms of quality, vibrancy, vitality, culture and safety after dark across the whole of the city. This will encourage increased use and extended dwell times which will support a safe, sustainable evening/ night time economy.

We are home to many landmarks synonymous with 'tourist London'. We have some of the most affluent residential areas in the country, but a diverse demographic means we also have some of the most deprived.

Lighting affects the perception of a place and influences how we feel and interact with the built environment. Good quality lighting can transform a place and be used to promote inclusion, safety and security. Lighting can contribute to effective way- finding through streets, squares and spaces, highlight architectural detail and be used effectively as a form of public art.



**Image 2: Stairs, Golden Jubilee Footbridge**   **Image 3: Golden Jubilee Footbridge**

The Lighting Master Plan enables a comprehensive approach that identifies lighting proposals and strategies to enhance night time safety and improve the vibrancy, local area culture and attractiveness of the city at all times of day and night. It promotes the adoption of sustainable and environmentally suitable lighting solutions to manage energy as well as carbon use and

reduce light pollution. The opportunity must be taken to achieve sustainable lighting solutions through a whole life costing assessment including the specification of energy efficient lighting utilising intelligent controls to minimise unnecessary lighting and consequential energy inefficiencies.

Lighting can also support investment in the public realm and help activate spaces to make them more inclusive and enjoyable for all.

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## 2. OUR APPROACH FOR WESTMINSTER

The Lighting Master Plan sits within the content of the Westminster City Plan 2019-2040 <sup>1</sup> aligning to the following core policies:

- Spatial Strategy Policies;
- Economy and Employment Policies;
- Connection Policies;
- Environmental Policies; and
- Design Policies.

The Lighting Master Plan sets out the parameters by which new lighting schemes for streets, spaces and structures will be assessed to ensure that, befitting of an intelligent city, a cohesive, energy efficient and dynamic approach is delivered over time.

The strategy set out within this document will enhance, either through standalone lighting applications or as part of streetscape projects, the day and night time characteristics of Westminster, celebrating what is best whilst also delivering a plan that promotes inclusion, safety and security as well as contributing to effective way-finding through streets, squares and spaces, highlight architectural detail, monuments and be used effectively as a form of public interest. This will improve the attractiveness of the public realm and enhance the resident, visitor and business experience encouraging more people to live, work and visit the city and spend/ invest more.

The strategy will help deliver a sustainable and serviceable lighting infrastructure promoting links with transportation hubs, embracing innovation and using smart technologies thus bringing energy, carbon and financial operational savings.

Each of the following chapters explores these points in detail referencing where required to more details guidance documentation as developed by Westminster over the years.



Good external lighting has been shown to reduce night time road accidents and street crime, as well as reducing the fear and perception of crime to the benefit of motorists, pedestrians, residents and businesses alike, improving their quality of urban and rural life.

However rising energy prices, local government grant reductions, the increasing awareness of high carbon use as well as budgetary austerity measures are all impacting on the lighting services. This creates a need to balance the social, environment and economic elements of the service.

<sup>1</sup> [https://www.westminster.gov.uk/sites/default/files/city\\_plan\\_online.pdf](https://www.westminster.gov.uk/sites/default/files/city_plan_online.pdf)



This is not to say that saving energy is not important, as lighting can play an important role in energy and carbon reduction, but it should be balanced against the positive effects of lighting which are just as significant.

To provide good lighting installations, Westminster aims to meet the requirements of what is termed Ultra Efficient Lighting (UEL). This is defined as the '4 R's' i.e. providing the right light, in the right place at the right time, controlled by the right system.

This can be further broken down as follows:

- Right light – using the correct light source which provides the required colour rendering and colour temperature for the task being lit, also ensuring that the appropriate levels of light are provided on the task area;
- Right place – ensuring that through the use of good optics and luminaires only the task being considered is lit with little or no spill light using the minimum number of lighting points;
- At the right time– lighting is only operating at the times required; and
- Right controls – the use of good control systems can ensure that the lighting system is operating at maximum efficiency, and in some cases, can also be self-monitoring, reporting outages and energy consumption to the user.

Further efficiencies can be gained by ensuring that any installations are designed by competent designers / professionals who understand the requirements of the tasks being lit and the relevant standards, and who look to a whole life costing assessment of the technology and options available to provide an energy and carbon efficient installation.



**Image 4: Column Lighting**



**Image 5: Belgrave Square**

### **A vision for a safer, healthier, greener and sustainable city**

Lighting has the power to reveal or conceal buildings, landscapes and topographical features, define routes and boundaries and emphasise views. The Lighting Master Plan builds upon this to promote Westminster's identity through the application of a considered hierarchy of roads, areas and features.

Good lighting, both functional and decorative, changes the feel of an area and how people behave within the setting. This is not just by night; through the use of appropriate equipment and styles we can provide a day time aesthetic which will act as an identity to an area or route. The strategy creates a distinctive identity for the city, enhancing existing historical and key buildings and areas whilst also looking at the needs for residential areas and looking forward as the city and style of building and areas develop.



Minimalism in the streetscape is not only more environmentally responsible by reducing the use of materials; it is also neater and produces a more elegant vista. Everything needs to earn its place in the street and should only be used if it has an unavoidable or desirable function for the greater public good. All projects need to consider how best lighting can be incorporated within the street scape, be it wall or column mounted and it will best fit with other street furniture both by day and night. This will include consideration of materials used, colour and location whilst also considering requirements of both the need to provide and maintain it.



**Image 6: Victoria Embankment**

### **Way finding, Connection and Legibility**

Way- finding totems, link routes and nodes have been identified and the Lighting Strategy considers how these features may be considered and can become statement features welcoming visitors, residents and business users to the city and then leading them through to their destinations. This can be achieved through the illumination of key buildings, landscapes and structures along key routes and at key transportation hubs.

Street lighting is a key component of the strategy and will provide a base level of lighting across the city. This can then be built upon looking to the requirements of the users and their level of activity, applying the appropriate Standards and national guidance to provide a safe and secure environment for all users including access needs for vulnerable groups.

The strategy considers the design and style of columns, brackets, luminaires and light source to provide identity. Way- finding features will encourage exploration of the city, as well as advising visitors through a Smart network of events, attractions and public realm projects they may wish to visit but were not aware of.





Figure 2: Marylebone Station, Artistic Impression



### 3. OBJECTIVES

These objectives all contribute to our commitment to improve the health and wellbeing of the city's residents and works to help ensure Westminster is a place we can be proud to hand to our successors. The objectives also contribute to the delivery of three key themes in the council's ambition to make Westminster a City for All: homes and communities, a healthier and greener city and opportunities for growth. The success of the Lighting Master Plan will be monitored against these objectives.

Lighting schemes that require planning approval will be measured and assessed against these objectives.

We need light to see, and artificial lighting has become an essential part of modern life. It helps provide a safe environment for a range of activities such as driving, cycling, walking and sports, and can also enhance the environment by means of decorative and flood lighting of areas, features and buildings. Good lighting enables an environment to function in the way it was intended, whether it is as a safe residential street or a thriving 24/7 city centre.

#### 1 Support the night time economy

It is recognised that good light and lighting practice can significantly enhance the city for residents, tourists, workers and businesses alike and drive forward the associated economies promoting inclusivity drawing people into areas at night.

#### 2 Co-ordinated approach

A strategic approach ensures that all artificial lighting is approached and considered holistically to form a co-ordinated lit environment across the city.

#### 3 Sustainability

Taking a European Commission Green Public Procurement approach to the consideration, planning, design and operation as well as the application of the right technologies, standards and guidance through a whole life costing approach reduces the energy and carbon footprint and provides a reliable sustainable and maintainable lighting installation.

#### 4 Celebrate our unique heritage

Highlight, reveal and enhance the night time character and identity celebrating the city's unique heritage, historic and cosmopolitan environment, while encouraging innovations in lighting technology and improving sense of place.

#### 5 Future ready

Develop an approach by which the lighting infrastructure is considered to support future technologies associated with good light & lighting practice and Smart City applications. Advising on how these can be assessed, trialled and if suitable brought into standard application.

#### 6 Way-finding

Through lighting equipment style and application enable all users to locate themselves and navigate through the city by providing local identities by day and night and the appropriate lighting of key way-finding landmarks, nodes and routes at both a city wide and local area level.

#### 7 Quality in design

Promote quality in the design and application of lighting, ensuring that Westminster is attractive, welcoming and neighbourhoods continue to thrive.

## 8 Making people feel safe

Provide adequate lighting to increase perceived and real safety, adding interest to pedestrian journeys.

## 9 Environment

Manage the environment and consequences that arise from using artificial light at night with respect to humans as well as our treasured flora and fauna.

These objectives are not mutually exclusive but have large overlaps; improving lighting in an area demonstrates investment within that area, promotes safety but also links to developing the local economy and celebrating local distinctiveness, perhaps changing a perception of an area.



Image 7: The Cenotaph, Whitehall

## 4. SETTING/ HISTORY

Westminster provides a diverse landscape ranging from historic areas to residential streets, businesses, entertainment and retail areas through to river frontage and bridges as well as parks and heritage and ceremonial routes. A large area of Westminster sits within a historic landscape and in some cases the public lighting is of historic value and is considered a cherished asset. Westminster has through many documents looked to address and consider all aspects of artificial lighting and including the style and pallet of materials to be used for all aspects of the public realm.

Public lighting in the City of Westminster has developed over the years in line with technological improvements in lighting equipment and luminaires. The council has always recognised the importance of traditional lighting designs to compliment the historic character of the many Conservation Areas within the city but also recognises that the streetscape changes as modern building appearances develop.

Westminster City Council has 14,869 lighting columns, with approximately 6,940 being of a decorative traditional style. The council has many unique lighting columns and lanterns, for example the Westminster City Council Grey Wornum, specifically designed by the eminent Architect, George Grey Wornum in the early 1950s. The Grey Wornum together with many other fine examples of lighting columns and lanterns have been preserved by the City Council and in recent times, refurbished to ensure illumination levels meet present day standards.

There has been a need for higher levels of illumination in certain areas of the city due to increased vehicular and pedestrian usage. This has often resulted in traditional decorative forms of lighting being supplemented by modern forms of light. In such cases great care is needed to ensure modern lighting techniques blend well with unique settings.

The lighting of buildings, monuments and art works within the city creates atmosphere and interest to those within the public realm and can act as features, route markers and focal points within the streetscape, attracting people to visit that area. However, the lighting of such features must be carefully considered; the proposed lighting must be in keeping with the environment and area concerned without being too bright and distracting.

At times it is likely that architectural lighting will be applied to a building that also requires the location of functional lighting to light the street. This requires careful consideration of the luminaires to be used such that each lighting solution, architectural and functional, achieves their desired task but does not affect the other.

Westminster seeks the preservation of the streets' historic nature whilst looking forward to developing a low carbon infrastructure and meeting the future needs of all the city's users.



## 5. KEY INITIATIVES

The development of the Lighting Master Plan is based upon a cohesive approach to the design and specification of lighting to deliver co-ordinated installations that suit the current and future nature of the streets and public areas providing road and area identities by day and night, encouraging interest and hence footfall and further economic development. The key areas discussed within this plan are:

- Key gateways, entries and markers
- Street lighting including footways
- Special areas, feature and orientation lighting
- Lighting for retail
- Architectural / urban realm enhancement lighting
- Lighting of green spaces
- Lighting art / festivals / events
- Managing obtrusive light / ecology
- Sustainability
- Way- finding
- Construction & maintenance
- Future Ready



Image 8: Victoria Bus Station

### Create a unique heritage, historic and cosmopolitan environment

Pedestrian and vehicular movement within the City of Westminster need to be understood and routes must be treated in different ways, giving clear instructions to pedestrian and vehicle traffic. The lighting plan references our clearly defined hierarchy of streets and spaces, each to be reinforced by specific lighting treatments and a hierarchy of lighting levels. It is proposed that in general streets be illuminated to the required Standard based upon the Westminster street hierarchy with the use of a warm white colour temperature (3000K light source). However, the colour temperature may vary to meet aesthetic considerations of different areas throughout the city such as the use of a crisp white (3500K or 4000k) light source to enhance an area or create an ambience, internal streets and spaces; or potentially a warmer light source (2200k - 2700K) in heritage lanterns.



Image 9: St Margaret's Church

In addition, each will be enhanced and identified distinctively using a variety of lighting treatments. Variety within each area may be achieved through application of differing approaches to the selection and design of:

- Styles and scale of lighting columns, equipment etc;
- Scale of lighting intervention;
- Colour temperature appearance of the light;
- The approach to illumination of architecture and landscape; and
- Support objectives of the urban design and public art strategies.

Within the city, streets broadly fall into the following categories

- Conservation areas;
- TLRN (main roads managed by TfL);
- Main roads (not managed by TfL);
- Processional routes;
- Normal residential area lighting;
- Prime sites where enhanced maintenance is common, i.e. Theatreland, Leicester Square, Whitehall, etc.; and
- Principal shopping streets in the Central Activities Zone (CAZ), i.e. Oxford Street, New and Old Bond Street, Regent Street, Coventry Street, Long Acre, Victoria Street, etc. Within the city, other district centres exist outside CAZ and these warrant a degree of special attention. These are places where people shop locally and serve the residential areas:

Within the city, other district centres exist outside CAZ and these warrant a degree of special attention. These are places where people shop locally and serve the residential areas.

- Church Street/ Edgware Road;
- Harrow Road;
- Marylebone High Street;
- Praed Street/ Spring Street/ London Street;
- Queensway/ Westbourne Grove;
- St John's Wood High Street/ Circus Road; and
- Warwick Way/ Tachbrook Street.

## Nurturing Growth in Westminster

Good lighting practice provides a safe night time environment for users but can, when considered appropriately, also create interest, provide way finding and aid the economics of the city. This plan does not just look to a blanket approach of applying Standards, but considers opportunities to create lighting experiences through the creation of a sense of attractiveness and quality.

This may be achieved by looking at lighting for art or specific events and festivals. It includes the effect and artistic lighting within underpasses, adjacent to key routes or specific existing or new features within the public realm such as lit art works, the application of lit trees or image and pattern projections across pavements.





Figure 3: Edgware Road A40 Flyover, Artistic Impression



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## 6. KEY GATEWAYS, NODES AND MARKERS

Gateways and markers denote key entry points to the city and areas within the city and give an identity to an area and delineate a route to a defined location, point or hub through the city. After dark these features and routes require a bold statement linked to the illumination of buildings, landscape and structures at the gateway and along the route.

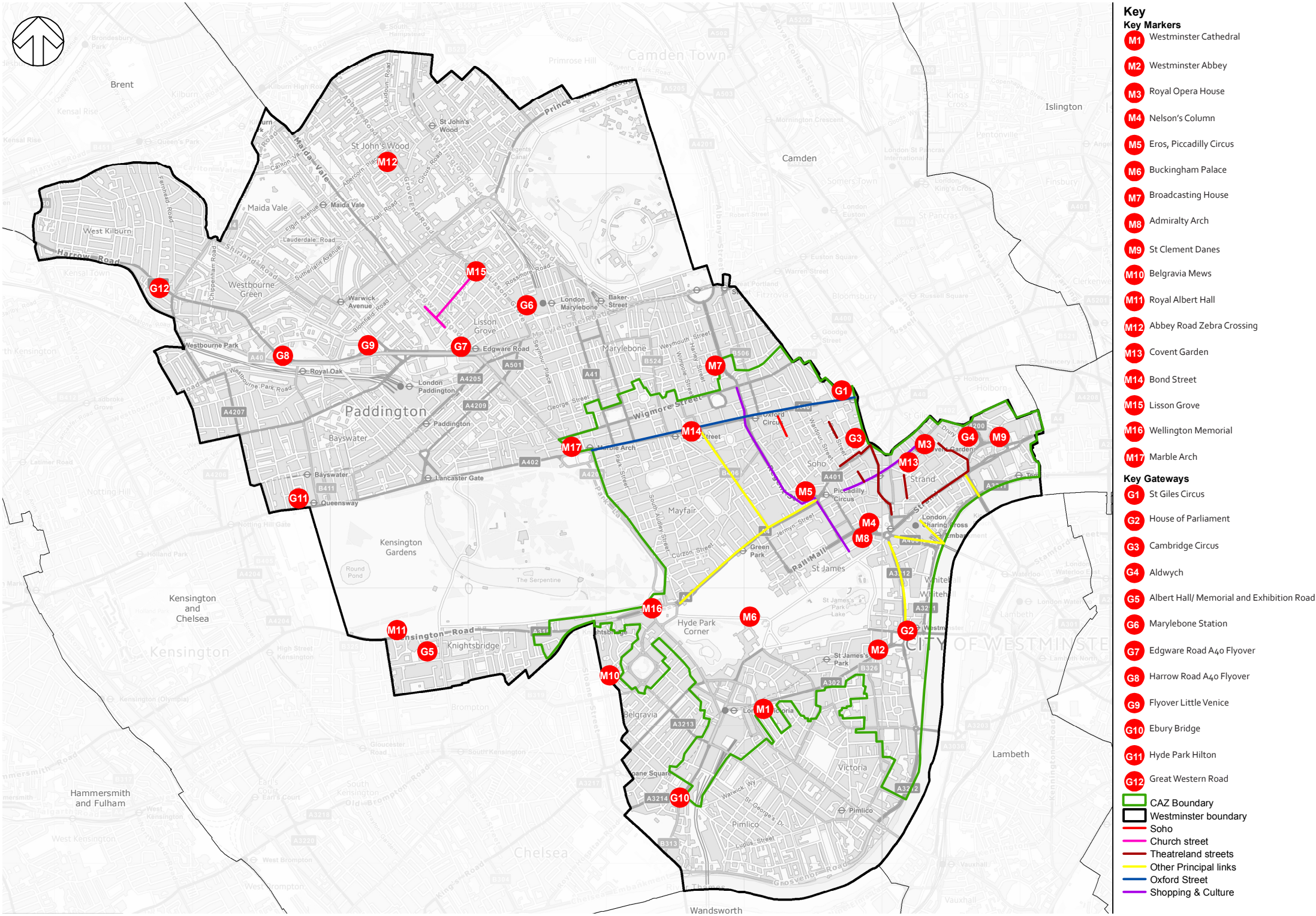
The principal gateways into Westminster are defined by highly lit streets and strong landmark buildings and shown on Map 1.

Examples of these are:

- Aldwych
- Albert Hall / Memorial and Exhibition Road
- Cambridge Circus (with Camden)
- Houses of Parliament (including Westminster Bridge and Embankment)
- Marble Arch
- St Giles Circus (with Camden)
- Wellington Memorial (Hyde Park Corner)

Within the city, but not 'entrances' are key landmarks and beacons are shown on Map 1 and examples of these are:

- Admiralty Arch
- Broadcasting House with All Souls, Langham Place
- Eros, Piccadilly Circus
- Nelson's Column/ National Gallery/ St Martin-in-the-Fields
- Royal Opera House
- Westminster Abbey
- Westminster Cathedral

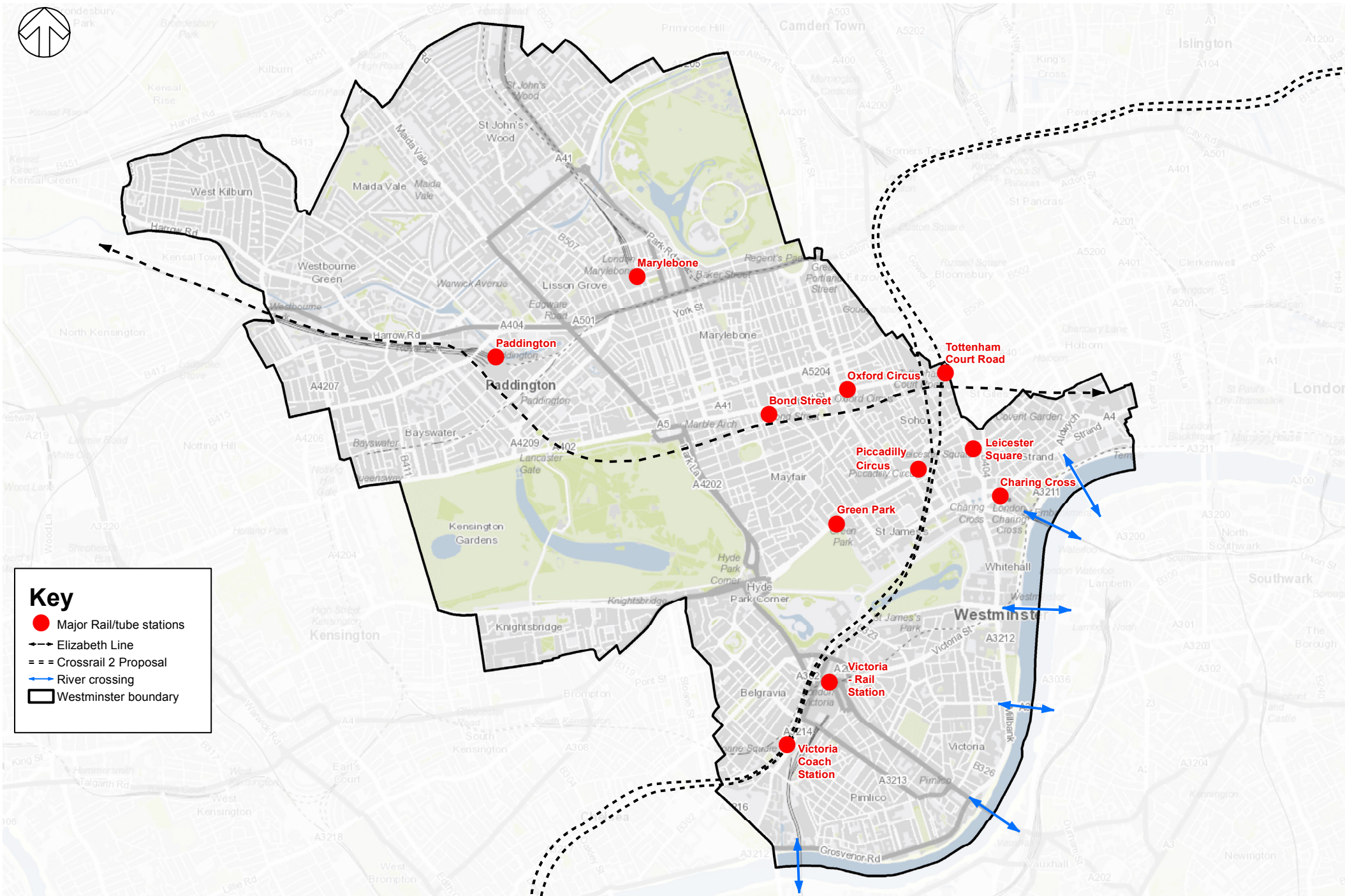


Map 1: Lighting Gateways and Markers



Nodes

These are often tube stations, mainline rail termini and other traffic interchanges that are key places for orientation and destination shown on Map 2.



Map 2: Key Nodes



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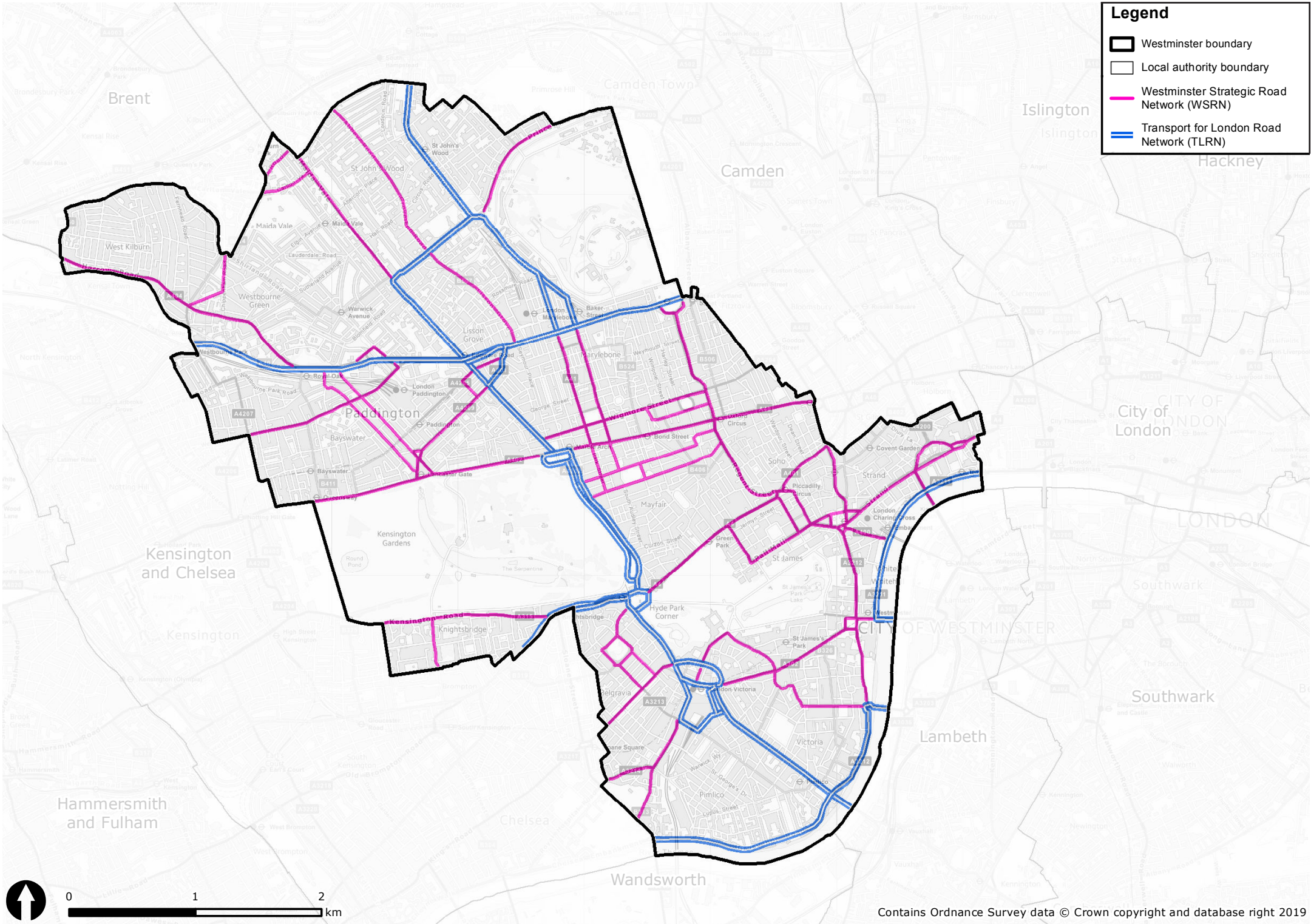
## Linking together

The gateways, nodes landmarks and beacons are anchor points for the network of roads that comprise the heart of the West End. The main thread of the 'necklace' runs from the main cultural institutions at the BBC and Royal Opera House with linking strands through the principal shopping streets and theatre / cinema and other cultural sites and clusters in the West End.

The feeders are the Transport for London Road Network (TLRN) and principal city roads shown on Map 3. The other spaces are infilled by the network of residential and mixed-use streets where the green oasis of squares and some tree lined side streets are differentiated from the more urban streets.

The seven district centres will be differentiated within the more residential parts by suitable consideration of design principles and practice of harmonising different lighting columns to the surroundings and appropriate lighting levels.

Within the matrix of residential and conservation areas historic columns and appropriate technology in refurbished lantern heads will ensure their character is conserved.



Map 3: City of Westminster Road Hierarchy



## 7. STREET LIGHTING

Public lighting is only one aspect of the street scene; the type and design of a lighting scheme must show regard for, and be compatible with, other street furniture and the reduction of street clutter. Street lighting forms the backbone to the evening and night scape of a city and during the day the style of columns or lighting placement can also lend an identity to the area, street or location and aid location and way-finding. It forms the function lighting to prove a safe and navigable public realm encouraging people out which aids the local economy and brings added security to an area.

In the urban street scene public lighting can provide the overall background level of lighting for secondary light sources such as shop fronts and the floodlighting of buildings and monuments. Public lighting can also create imaginative effects in its own right.

Public lighting cannot be viewed in isolation and should never be seen simply as providing a certain fitting with a certain type of lamp.

*"Good public lighting" is an art as well as a technical street furniture matter. The aim of public lighting is to encourage a safe environment for all highway users and pursuits, where people and vehicles can see and be seen. Thus, meeting the council's duties under Section 17 of the Crime and Disorder Act 1998. "Without prejudice to any other obligation imposed on it, it shall be the duty of each authority to which this section applies to exercise its various functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent, crime and disorder in its area."*

There are additional considerations concerning the visual quality and colour of light and what lighting can achieve including the emphasis of foliage shadows and colours. In addition to considerations concerning washing and spotlighting of buildings or structures and creating contrast and variety.

Residential amenity and access / user requirements must be considered when positioning lights and specifying light levels, especially in narrow streets or where wall mounted luminaires are used. Conflicting concerns are the practical needs of pedestrian personal security, and Policing requirements for good illumination.

The guidelines within the London Local Authority and Transport for London Act 2013 – Part 2 Section 4 'Lighting Attachments and Street Signs'<sup>2</sup> empowers the City of Westminster to install lights and signs on buildings to reducing the need to erect columns on the pavement, which means walkways will be safer for people with impaired vision or mobility by reducing the number of obstacles they encounter, hence improving pedestrian comfort and equality of access.

Lighting classes and levels should be chosen to suit the needs of the user and environment ensuring a balance between the need for visual / dramatic effect through decorative lighting and the task lighting provided to ensure a safe environment, whilst suiting the scale and character of the area. Guidance on the 'base' lighting class can be gained through consideration of the Westminster road hierarchy and the appropriate standards and national guidance.

Westminster City Council encompasses a wide range of urban spaces from modern residential streets to internationally renowned tourist attractions and areas of great historic importance. The design of the street lighting needs to be tailored to the individual circumstances of each situation. It should also comply with the overall lighting strategy which reflects the broad hierarchy of urban form and function across the city.

<sup>2</sup> [http://www.legislation.gov.uk/ukla/2013/5/pdfs/ukla\\_20130005\\_en.pdf](http://www.legislation.gov.uk/ukla/2013/5/pdfs/ukla_20130005_en.pdf)

Required illumination levels

A staged approach is adopted for the assessment of the appropriate lighting level for each situation. British Standards 5489-1 & BS EN 13201-2Road Lighting (current versions), detail the appropriate lighting levels for varying classes of road and footways.

Due reference shall also be made to national lighting good practice such as the professional Lighting Guides and technical reports produced by the Institution of Lighting Professionals (ILP) and Society of Light and Lighting (SLL).

Westminster has a policy to use white light sources with a colour rendering index greater than 60 and colour temperature of 3,000 kelvin, this may change to meet aesthetic considerations of different areas throughout the city and also changes to colour rendering standards. The standards for subsidiary roads permit the design lighting class to be adjusted in accordance with the light source S/ P ratio, this shall be applied.

Westminster has used a common network hierarchy based on the importance of each street subdivided into carriageways, footways and cycleways. The network hierarchy aligns with the Code of Practice ‘Well Managed Highway Infrastructure’, recommendation 12- Network Hierarchy of the Code states;

- A network hierarchy, or a series of related hierarchies, should be defined which comprises all elements of the highway including carriageways, footways, cycle routes, structures, lighting and rights of way
- The hierarchy should take into account current and expected use, resilience, and local economic and social factors such as industry, schools, hospitals and similar, as well as the desirability of continuity and of a consistent approach for walking and cycling.

A hierarchy for carriageways, footways and cycleways based on functionality factors and are advised in Tables 1A, B and C.

The Inspection Hierarchies are presented in map form in Appendix A.

WCC Category	Functionality Factor	Functionality Definition
SR	Borough Principle Road Network	The main signed traffic routes for through traffic. Transport for London road network (TLRN) maintained by TFL.
A1	Prestige	High profile e.g. Main shopping streets, Tourist Attractions, Main Rail, Terminus/ Interchanges, Ceremonial Routes, CAZ Frontage, International Shopping Centres and other Shopping Centres within the CAZ.
A2	Special Streets	Streets with special functionality (note these may include but not exclusively traffic sensitive streets and streets of operational and special engineering difficulty)
B	Very High Traffic Volume Essential Services Major Traffic Generators  Very High Cyclist Volume Resilient Network Major Bus Route High HGV Usage	e.g. AADF>50K, Local Knowledge e.g. Hospital, Fire Station, Police Station e.g. Rail Station, Underground Station, Large School, Major Shopping Centres & District (Primary & Secondary) Shopping Centres e.g. AADF>5000, Defined Cycle Route (X,Y,Z) Winter Service Resilient Network e.g. 24hr Bus Route, High Frequency routes, Bus Depot, Street Cleansing Depots, Industrial Estate
C	High Traffic Volume Medium Traffic Generator  High Cyclist Volume Resilient Network Minor Bus Route	e.g. 50K>AADF>15K, Local Knowledge e.g. Local Shopping Centres (Shopping Pa- rades) e.g. 5000>AADF>1000, Local Knowledge (X,Y,Z) Winter Service Resilient Network e.g. Medium frequency routes
D	Medium Traffic Volume Minor Traffic Generators Medium Cyclist Volume  Infrequent Bus Route Medium HGV Usage	e.g. 15K>AADF>3K, Local Knowledge, Places of Worship, GP Surgery e.g. 1000>AADF>500, Local Knowledge (X,Y,Z) e.g. Low frequency routes Routes to Bus Depot, Street Cleansing Depots, Industrial Estate
E	Low Traffic Volume No Traffic Generator Low Cyclist Volume	e.g. AADF<3K, Local Knowledge None of the above e.g. AADF<500, Local Knowledge (X,Y,Z)

Table 1A: Carriageway Hierarchy Definition



Category	Functionality Factor	Functionality Definition
A1	Prestige	High profile- Main shopping streets, Tourist Attractions, Main Rail, Terminus/ Interchanges, Ceremonial Routes, CAZ Frontage, International Shopping Centres and other Shopping Centres within the CAZ
A2	Special Streets	Streets with pedestrian access difficulties, restricted working width
B	Very High Pedestrian Volume	e.g. Pedestrian Football (Total + Peak) Local Knowledge
	Essential Services	e.g. Hospital, Care Home, Police Station
	Major Traffic Generators	e.g. Rail Station, Underground Station, Large School or University
C	Major Bus Route	e.g. 24hr Bus Route, High frequency routes
	High Pedestrian Volume	e.g. Pedestrian Football (Total + Peak) Local Knowledge
	Medium Traffic Generators	e.g. Medium Schools, Local Shopping Centres (Shopping Parades)
D	Vulnerable Users	e.g. GP Surgery, Senior Citizens Home
	Shared Use	e.g. Shared Streets- Carriageway/ Footway and Cycle/ Footway
	Minor Bus Route	e.g. Medium Frequency routes
E	Medium Pedestrian Volume	e.g. Pedestrian Football (Total) Local Knowledge
	Minor Traffic Generators	Small School, Places of Worship, GP Surgery
	Infrequent Bus Route	e.g. Low Frequency routes
E	Low Pedestrian Volume	e.g. Pedestrian Football (Total) Local Knowledge
	No Traffic Generators	edge
		None of the above

Table 1B: Footway Hierarchy Definitions

Category	Functionality Factor	Functionality Definition
x	Cycle Superhighway Network	Cycle Superhighway
y	WCC Quietways	Unsegregated cycleways
z	Docking Station	Designated cycle hire stations and cycle stands

Table 1C: Cycleway Hierarchy Definitions

Where applicable to lighting class the base lighting level shall be referenced and revised as required (as defined within BS5489-1 Road Lighting) considering the Westminster street crime data to determine if the lighting class should be increased due to current levels of street crime. The review shall be based upon street crime data where 0 to 50 crimes per annum are classed as low, 50 to 100 as medium and > 100 as high crime.

Local factors which may also be applicable to roads and areas also require due consideration and include;

- (i) Pedestrian Subways
- (ii) Accident Black spots
- (iii) Light Pollution

The method of establishing lighting levels is based on the category of road and its usage; although relevant in the majority of circumstances this approach does not give consideration to special areas. These are discussed within this plan and give consideration to both the 'day' and 'night' time streetscape and in particular the importance of achieving the correct mix and balance of lighting between road and surrounding areas to enhance the aesthetics and architectural environment for the following areas;

Prime Sites and Important Streets which have been considered separately and appropriately;

- (i) Ceremonial Routes
- (ii) Commercial
- (iii) Squares (Cultural, entertainment & residential)

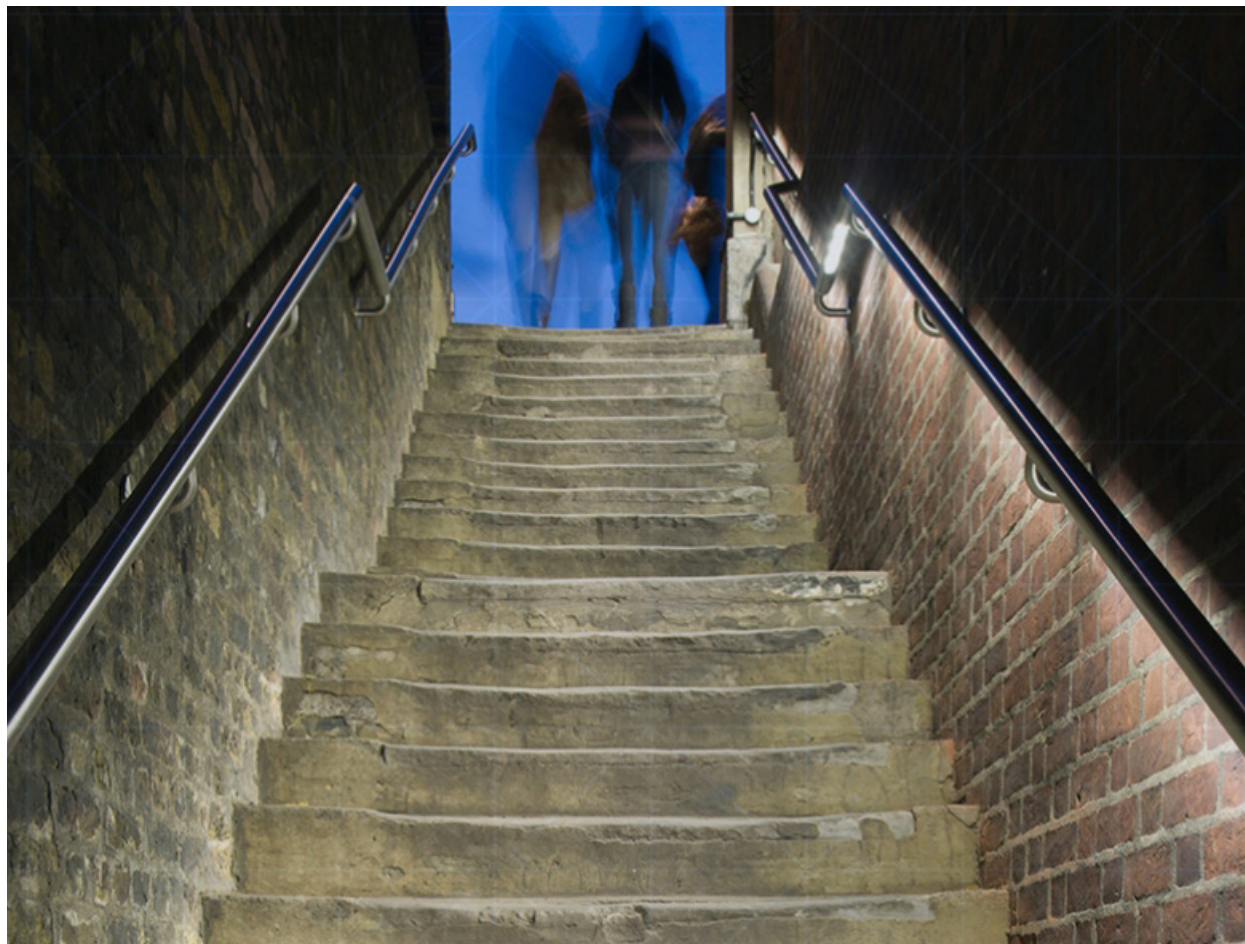
Areas of significant pedestrian use;

- (i) Commercial
- (ii) Routes between key locations, transport terminals

There are unique areas within the city which require further consideration when establishing lighting levels, such as;

- Thames Corridor
- Little Venice
- Conservation Areas
- High Security Areas

Due consideration shall be given to adaptive lighting levels as part of the design and new installations may be set to underrun the lighting performance (constant light output) such that the designed lighting level is maintained at all times.



**Image 10: Essex Street Steps**

## Mounting

The mounting height of luminaires should be sympathetic to the height and width of the street or area being lit and the tasks being undertaken within them.

When considering mounting heights and locations it is important to consider future access and maintenance to ensure that the lighting installations can be accessed through standard plant and equipment for maintenance purposes. This is discussed further in the construction and maintenance section of this plan.

## Equipment considerations

`Standard' luminaires, as defined within the plan, should be used in residential areas, with subtle amounts of light being spilled onto adjacent gardens and properties. Subtle amounts of light spill in these areas can assist with community safety and help create a better perception of the neighbourhood. Where required, approved shields shall be fitted within the luminaires to prevent light intrusion.

Light should be restricted towards residential windows and where it is considered that a concern may arise from a resident, the designer shall incorporate appropriate manufacturer's designed shields within the luminaire.

The application of Standard will not preclude consideration for effect lighting creating interest along a route but still providing the level of visual information the user requires to safely navigate their route and feel safe.





**Image 11: Queen Elizabeth Olympic Park**

## Luminaires

Luminaires shall be of a style to suit their purpose, provide the required optical performance and comply with the EU circular economy requirements in that they shall be serviceable, upgradable and maintainable throughout their operational life.

## Source and control

The colour of the light source used and how well the street lighting performs is of importance as it affects how an area is perceived.

The choice of light source is a fundamental element of lighting design. Light

sources are constantly changing their performance in relation to light output, colour rendering, lamp life and lumen maintenance.

In general, new public lighting designs should be carried out utilising LED light sources with a colour temperature of 3,000K (this may change to meet aesthetic considerations of different areas throughout the city and also changes to colour rendering standards) as the standard light source and these should be used in conjunction with dimmable drivers, for retro-fit installations using existing luminaires then the designer must ensure that the retro-fit solution is compatible with the luminaire and all photometric details and CE certification relate to a retro-fit solution within the luminaire.



**Image 12: Pathway Lighting**



**Image 13: Belgrave Square**



## Gas lighting

Westminster has 306 gas lighting columns of which many date back to the first original gas-lit streets. Some of these are unique and are Listed structures, such as the gas vent column off the Strand and an original Cannon column in New Row. Gas energy is a very expensive and high carbon generating fuel and in order to meet the council's climate emergency of net zero carbon output by 2030, the council are retrofitting the unlisted gas light with LED "gas effect" lights and provide electrical power, bringing the roads with these lights on them up to current British Standards without changing the aesthetic of the column and lantern itself. The council will engage with Historic England regarding the nature of the listed gas lights to agree solutions, where possible, to electrify these lights and meet the council's climate emergency.



**Image 14: Gas Lighting**

## Maintenance factors

Shall be selected in accordance with BS5489: Road lighting Part 1

## Lighting control

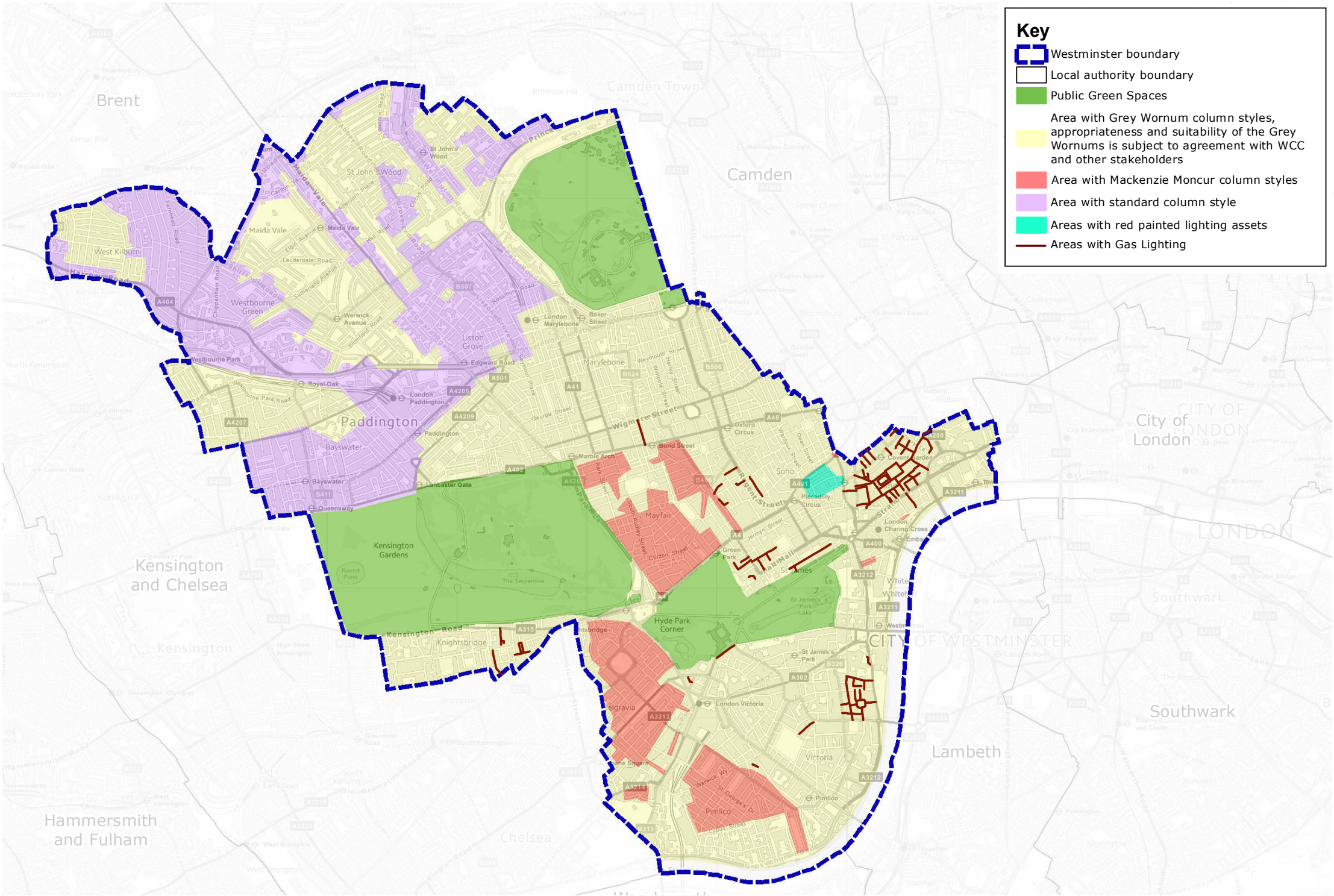
Lighting shall be controlled through the application of the approved council Central Management System (CMS) and commissioned to operate as detailed within the design for the specific streets / areas.

## Column styles

Across the city the street column style generally in use is the iconic Westminster design known as the Grey Wornum. The lantern is available in three sizes: small for 5m or 6m post top and wall mounting versions, an 8m large version and a 10m version, known as the Extra Large Grey Wornum which is used for wide distributor roads and similar locations. They are the city's marque and are used across most conservation areas.

Within the city there are also several other column styles that provide a location reference and are used within certain areas and these are indicated on the Map 4 detailing the areas of principal column styles. These include but are not limited to the Mackenzie Moncur, St Martin-in-the-Field and others which are indicated within Appendix B of this document. In some areas such as Chinatown columns are painted red to provide an area identity.





Map 4: Existing Column and Luminaire Styles in the City of Westminster



Many lighting columns in prominent locations that are not historic have characteristic Westminster style embellishment kits added to them, but there will be locations requiring a simpler approach with tapered columns or undecorated columns.

In older parts of the city, there survive some historic lighting installations and in these places the original type should be maintained in the original location where possible. Some columns may not have electrical access compartments and changes to this stock must be carefully considered and planned. Replacement cast columns could be designed with base compartments or electrical supplies located in a discrete location within the street.

The style of the column needs to suit the streetscape as well as the light source and over the years the lighting column design has developed to reflect these aspects.

Heritage style columns have their place within the city but may not be appropriate in areas of new development where modern style buildings are being developed together with modern transportation hub entrances. Here a more modern style column may be preferable but must be considered in a street context and not based upon individual buildings.

In order to protect the council against future operation and maintenance such columns should not be bespoke in specification and design nor sourced from a sole provider.



**Image 15: Old style Column, Bond Streets**



**Image 16: Vincent Square**



**Image 17: Regents Street**





Image 18: Oxford Street



Image 19: Victoria Street

### Wall mounted / catenary

Where wall mounted or catenary suspended luminaires are required, often due to narrow footways and streets or to reduce street clutter, their location must be considered carefully to ensure that they are not affected by the design of the façade upon which they or their anchorages are to be located. Their location on a façade should be suitable for mounting and their operation should not adversely affect any façade lighting that may be present.

In general catenary systems will be an exception rather than the norm but their use is not ruled out as specific circumstances such as area geometry may merit their consideration and application.

When considering any fixing to a building, those undertaking the design and installation of such works shall refer to the Construction Fixings Association (CFA) <sup>3</sup> guidance note regarding anchorage systems .

The suitability of the building structure to sustain the loads transferred from the proposed lighting and associate equipment must be established and recorded within the project documentation, prior to any installation work, by a competent person e.g. structural engineer. In general, concrete elements which are part of the load bearing structure will be suitable. Masonry structures may be suitable if they are load bearing and of solid, rather than cavity, construction and composed of strong masonry units with sound mortar joints.

### Existing equipment & signage

The relationship and light contribution between existing equipment to remain within / adjacent to any new lighting installation must be considered within the design process and must be shown on the proposal drawings.

When a replacement lighting scheme is to be installed, the designer must ensure that all signs, bollards and other equipment fed from the columns to be removed are given a feed from the new installation via transfer of the existing cabling, or if this is not possible, via a new cable/distribution network.

<sup>3</sup> [www.the-cfa.co.uk](http://www.the-cfa.co.uk)





Figure 4: Bond Street, Artistic Impression



## Whole life costing

Whole life costing aids the decision process to determine the most appropriate lighting solution based upon task requirements, energy and carbon use as well as buildability, maintenance and operation. It eliminates decisions based upon gut instinct and uneducated solutions and may lead to the lowest cost installation not being the most efficient and sustainable over its whole life operation.

This approach forces the designers and clients to challenge their own assumptions and those of others. This will lead to solutions that have been thought through more rigorously and will stand up to scrutiny and audit. All assumptions need to be recorded and shall consider cost, energy, carbon and maintenance.

## Electrical supplies

Where possible Distribution Network Operator (DNO) single phase 230Volt 50HZ supplies shall be used to individual street lighting columns and traffic signs. The designer should check with the DNO, UK Power Networks (UKPN) for supply availability.

Street furniture, including illuminated bollards, sited on remote traffic islands or central reservations should be supplied by a private cabling network (3 core), connected via a suitable double pole isolator and fuse to an adjacent DNO supplied lighting column.

Wall mounted luminaires shall be supplied from discretely located mini pillars with the cabling run discretely along the building façade using suitable cable such as 3 core Hi-Tuff or similar. The cable shall be run in galvanised conduit for additional protection for the first 2.5 metres above ground level. The wall mounted lighting installation on the Apple Store in Regents Street is a good example of a discrete installation (see images 20 & 21).



**Image 20: Wall mounted installation- Apple Store, Regents Street**



**Image 21: Wall mounted installation- Apple Store, Regents Street**

Typical supply cable termination arrangements are detailed in the standard drawings for Street Lighting Installations.

Where cabling may be visible, due consideration should be given to the colour of the cable's outer sheath such that blends in with the façade upon which it is run.

Existing columns without doors shall, where possible, be supplied from adjacent equipment such as signs or columns with doors to enable electrical isolation. If the option of supply pillars is considered, these shall only be used in discrete locations.



## 8. FEATURE AND ORIENTATION LIGHTING

Landmarks can help people navigate through a space by acting as visual markers, thereby helping individuals to identify their current location and determine their direction of travel. Landmarks can be government and municipal buildings, statues, bridges, tall buildings, historical buildings, geographical features, or sometimes just buildings that are visually prominent due to their location. These may include but not be limited to Big Ben, Westminster Abbey, Nelson's Column and St Clement Danes Church.

During the daytime these landmarks can be quite distinctive, but at night they may be unlit or poorly illuminated, making them difficult to identify and therefore creating confusion when trying to use them as navigational aids. Appropriate lighting of these landmarks can reinforce their presence, helping them to be identified at night.

When illuminating landmark buildings, priority should be given to the lighting of buildings of local importance, architectural merit and historical value.



Figure 5: Maida Vale Lisson Grove Area, Artistic Impression



Figure 6: Mews, Artistic Impression





Figure 7: Victoria Bus Station, Artistic Impression



A compromise between distant view and local surrounding must be made; the building should not contrast so strongly that it clashes with the atmosphere in its immediate environment. Within the overall framework provided by the road hierarchy some areas will need special consideration in the design of street lighting:

- Cultural squares
- Entertainment squares
- Ceremonial routes
- Residential squares
- High security areas
- Commercial areas of significant pedestrian use
- Prime sites
- Areas for Special Conservation: Thames Corridor

The prime sites manual of Westminster City Council lists the following areas as 'Prime Sites' and 'Important Street' respectively.

### ***Parliament Square:***

Including Little George Street, Margaret Street and Old Palace Yard. (Note that the central area of the Square is maintained by the Department of the Environment (DOE) to be consulted regarding any proposed work).

### ***Trafalgar Square:***

Including part of Cockspur Street and Pall Mall. (Note that the central area of the Square is maintained by the DOE).

### ***Piccadilly Circus:***

Including the south end of Shaftesbury Avenue and the rear of the London Pavilion.

### ***Leicester Square:***

Including Coventry Street, Swiss Court, Leicester Street and Court, Cranbourn Street, Irving Street, St Martin's Street and Panton Street.

### ***Whitehall and Parliament Street (also a ceremonial route) Strand:***

From Trafalgar Square to the council boundary.

### ***Piccadilly:***

Hyde Park Corner to Piccadilly Circus.

### ***The Ceremonial Route:***

Victoria Station to Parliament Square, including Wilton Road as well as the whole of Victoria Street; The Mall and Constitution Hill.

### ***Regent Street:***

Regent Street from Piccadilly Circus to Langham Place.

### Conservation areas

Details of the conservation areas are provided within Appendix C.

Many of these areas have a uniform use or building type e.g., the Queen's Park Estate or the suburb of Pimlico. Some have been continuously redeveloped to provide a "varied urban grain of great character".

It is the council's duty to "*pay special attention to the desirability of preserving or enhancing the character or appearance of conservation areas*".

As with building development it is essential that any lighting design within conservation areas "*employs the highest standards of design, respects the discipline imposed by the existing townscape, preserves or enhances the character and appearance of conservation areas and protects the architectural and historic interest....*".

Several of the conservation areas have already had their "*physical fabric*" upgraded, e.g. Leicester Square, Trafalgar Square and Portland Place. The street lighting of these areas has been improved using traditional-type luminaire and column designs or discrete wall mounted area projectors, found either within the extent itself, or in neighbouring areas. Where possible historic photographs should be used as a source of original street lighting records.



**Image 22: Trial Luminaire, China Town**

Where there has been substantial redevelopment in these areas and the result is a "varied urban grain of rich character" the use of historic-type lanterns is not necessarily the correct design judgement to make. Many of these areas are visually complex and a simple uniform lantern and column may unify the scene more effectively than a traditionally ornate design.





Figure 8: Covent Garden Area, Artistic Impression





**Image 23: Under Bridge Illumination**

### **Listed buildings**

As with conservation areas any proposed new structure (lighting column and luminaire) should not have an “adverse visual impact on the settings of listed buildings.” As mentioned previously luminaires and lighting columns should be of an appropriate style to enhance rather than detract from historic / interesting buildings.

Consultation must be undertaken with the Westminster City Council when proposing structures close to or in the curtilage of such buildings.

### **Local gateways**

Local gateways and markers include:

- Soho
- Theatreland Streets
- Church Street
- Admiralty Arch
- Carnaby Street
- Marble Arch



**Image 24: Carnaby Street**



## 9. LIGHTING FOR RETAIL

Good lighting increases footfall and leads to economic development and this is best achieved through a combination of both functional and decorative lighting installations. The effective lighting of a building façade is an effective approach to creating interest and changing the perception of an area or street, providing an identity and encouraging retailers to consider locating their business there.



**Image 25: Main Retail Area, Knightsbridge**

Retail lighting must be managed, be it external façade, illuminated advertisements, signage or internal lighting 'spilling' out of the building into the street.

Westminster has a diverse mix of retail facilities providing for all needs from the high-end shops along Regent Street, Bond Street and Oxford Street to small corner stores meeting the needs of the local community.

Each retailer is encouraged to consider their functional internal shop lighting and the use of lighting after dark when the shops are closed can still create interest provided it is undertaken and operated sensibly. Retailers are encouraged to consider the illumination of their window displays such that light is 'retained' within the premise and does not 'spill' out of it.

To be sustainable the full interior lighting may be switched off or for security reasons may be dimmed during the hours the premises are not open or occupied.



**Image 26: Office Lighting at night**

External illuminated signage shall meet the requirements of the Institution of Lighting Professionals Professional Lighting Guide PLG05 which advises on limits for the brightness of such signs based upon the ambient lighting within the area and the background against which it is viewed.

## Display screens

These are covered by the ILP in their technical report PLG05 which advises on the brightness of such screens and displays based upon the general area ambient lighting levels and the background against which they are viewed.



**Image 27: Typical Display Screen**

- A maximum change / rate colour time for the displays.
- Consideration would also need to be given to highway safety with respect to any traffic signal installations. Where the motorist has a view of the traffic signal aspect with the display screen or shroud behind it then the use of red, amber or green would not be permitted.
- The display is not to become a source of illumination to the surrounding area as is the case with many such installations, especially when they have a white content within the image. Please provide horizontal illuminance calculations for the area immediately in front of the proposed screen and the adjacent road ways.

The requirements of these screens to be acceptable will include aspects such as:

- Limiting night luminance based against the background the sign is viewed against;
- Limiting daytime luminance values;
- Where there is moving traffic within sight of the screen the use of moving images would not be permitted;



## 10. ARCHITECTURAL/ URBAN REALM ENHANCEMENT LIGHTING

It is not enough for lighting to be technically compliant. If a lighting scheme is to be memorable it must also be aesthetically appealing. Lighting must stimulate, captivate and inspire. It must appeal to the senses and please the eye. Unlike the daytime view of the city, in which all the various forms and details are seen under natural light, by night each element of the city needs illumination to be appreciated. The hours of darkness provide the opportunity to light only those building and features that we want to see. The lighting can reveal previously overlooked views and details, allowing them to be seen in a fresh aspect.

A successful and memorable lighting scheme is a synthesis of both the functional and aesthetic. It must effectively combine the objectives of the lighting design guidelines (image & impact, commercial activity, safety & security, etc.) with the elements of the individual location.



Image 28: Accent Lighting

A key aspect of any architectural scheme be it a façade, public area feature, monument and the like is that it is balanced within the streetscape. The lighting levels used, light source and colour temperatures should be such that the finished lighting installation fits within the context of the street/ public realm from the view point of the observers without the building/ feature standing out or becoming a beacon.

In particular, lighting can be used to:

- Enhance key architectural features, promoting a unique after dark identity;
- Bring particular buildings to life by night, increasing perceived activity;
- Contribute to the illumination of surrounding streets, thus removing the need of additional stand-alone lamp columns;
- Create night-time landmarks, helping with after dark legibility.

Such lighting should also be designed such that it does not become a nuisance or affect the performance of the highway lighting.

The scale of the buildings when lit well can create points of drama. Many of these buildings have been placed on axial points of vistas. The levels of adjacent street lighting equipment should be low enough to allow the drama of floodlighting such landmark buildings. The optical performance of the equipment used to light the highway should be sympathetic to the needs of the building lighting and not distract from it or cause adverse spill light affecting the character lighting. Similarly, it is clear that small scale spaces should be sympathetically treated by the use of suitable fittings.



## Equipment

When considering any lighting equipment for the purpose of enhanced area / feature lighting the designer must consider the following aspects.



**Image 29: Water Fountain, Marble Arch**

## Street cleansing operations

All equipment located either within the surfacing or in close proximity to it will be subject to street cleansing operations and as such must be specified, designed located and installed such that these operations have no detrimental effect on either the lighting equipment in terms of its integrity or fixing nor the performance of the installation.

## Control of artificial optical radiation at Work Regulations (AOR)

Enhanced area / feature lighting is often in close proximity to the public and therefore requires the designer to consider photobiological safety of the light sources and luminaire to ensure that observers' exposure to such sources does not exceed recommended levels.

In order to facilitate client compliance with the control of artificial optical radiation at work regulations, the designer shall eliminate or reduce the photobiological risk to the workers and the public. Where possible all equipment shall be selected from the exempt risk group number (RG0); in special cases where RG0 products are not available RG1 rated products may be considered. No products rated RG2 or RG3 shall be used. The equipment from manufacturers who do not also provide exposure data must not be fitted to the Westminster network.

A methodology to determine the photobiological risk group (RG) classification of a luminaire is described in BS EN 62471: Photobiological safety of lamps and lamp systems. Note where a luminaire has a different RG classification for UVA and "blue light", the higher risk group shall be used.

## Drainage considerations

All surface mounted equipment, with the exception of that associated with water features, shall be located within areas with positive drainage away from the luminaire.



### Equipment impact loading

The designer shall consider the use of the area where the lighting equipment is to be used and ensure that its specification and the installation design including foundations, mounting arrangements and the like are suitable for expected loadings. These may relate to footfall, street cleansing operations, vehicles and in some areas (Marble Arch) ceremonial duties which may include horse hooves or even gun carriages.



Image 30: Water Fountain, Marble Arch

### Water ingress

All equipment shall be protected to IP67 as a minimum and the electrical system shall be such that all terminals are suitably rated and the luminaires/ gear compartments where heat build-up or cooling may be considered a concern shall have IP67 breathable filters/ membranes.

### Surface temperatures

Glazed surfaces when in operation must be safe to touch.

### Maintenance operations

All lighting installations shall be designed to ensure that maintenance activities can be undertaken using standard access equipment located appropriately within the street.

Equipment must be maintainable without the risk of water or dirt ingress affecting its future performance and operation.



## Bench lighting

The application of bench and under bench lighting has been very problematic within Westminster with installations having operational reliability problems, being prone to damage through street cleansing operations or vandalised. In most cases access to the lighting system has been difficult.



**Image 31: Bench Lighting**

Westminster would therefore prefer not to see under bench lighting proposed. Westminster will only consider under bench lighting in exceptional circumstances and key requirements subject to approval will be:

- Minimal clearance of 400mm from area surface to the lighting fitting(s);
- The bench shall have a suitable recess designed into it that will accommodate the luminaire(s) and electrical connections;
- The light effect shall be such that the light is projected downwards;
- All luminaires to be fully encapsulated; and
- Electrical supply to be low voltage.

Such equipment will be subject to a commuted sum payment or require a long-term management plan with costs covered by the developer for future maintenance and operational requirements. The area surrounding the benches shall have positive drainage away from the bench to facilitate maintenance access.

## Traffic safety

When building façades are illuminated due consideration needs to be given to highway safety from the view point of users of adjacent traffic signal installations. Where the motorist or pedestrian has a view of the traffic signal aspect with the display screen or lit façade behind it then the use of red, amber or green will not be permitted as potential exists to 'lose' the signal aspect in the lit façade.



**Image 32: Traffic signal aspects confused with Lighting façade**



### Post installation assessments

Most complaints arise not from the fact that lighting has been provided but due to it being incorrectly installed. Therefore, it is important that all lighting installations are checked against the original specification and, where required, photometric performance measurements are taken to ensure that the required lighting levels, be they for the area being lit or limitations placed on the surrounding area, are achieved.

It is expected that the designer of any lit installation will review the installed lighting scheme, confirm that the products specified have been used, that they have been installed and set up / aimed as per the design and that all control systems are working and that the end user / client understands how to use them.



**Image 33: Façade Lighting**



# 11. LIGHTING OF OPEN SPACES

Westminster’s open spaces vary from individual trees, through small incidents in the townscape to the extensive area of Hyde Park. Much of the city’s open space needs are catered for by the Royal Parks which are outside the scope of this guidance. For all these spaces the inclusion of lighting will extend their usage during the hours of darkness, making them safer and more attractive to enter, refer to Map 5 for open spaces within Westminster City.

## Pathways

Pathways removed from the carriageway provide import links through the city but come with a user concern regarding their perceived safety. The provision of good lighting levels, the lighting of the surrounding area and ensured vertical illuminance levels to aid user recognition of the body language of those approaching and around them is of importance in achieving this sense of safety and hence encourage use.



Image 34: Pathway Illumination

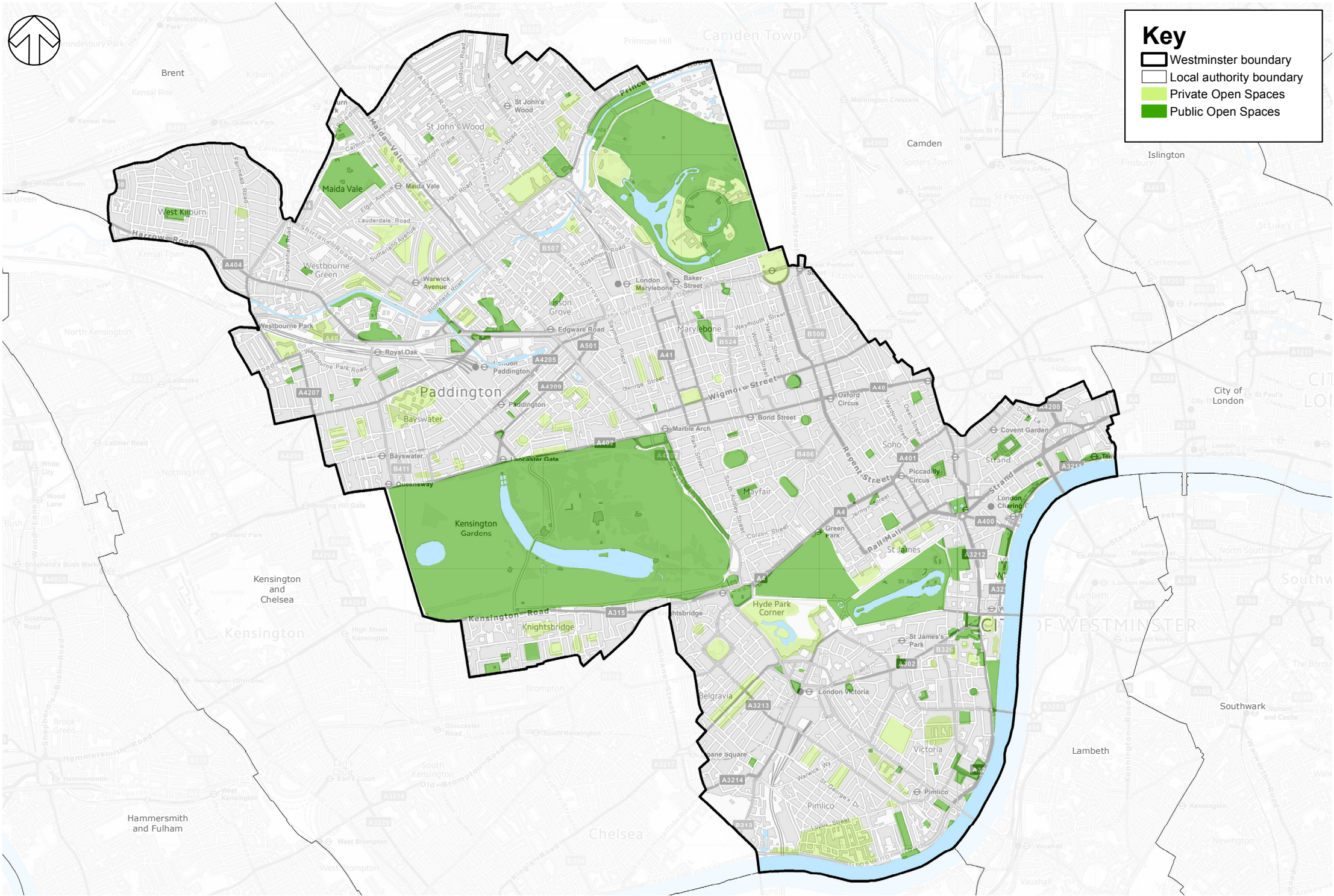
## Squares

The roadways around squares have an increased vehicle use whilst also providing parking, servicing, vehicle charging and cycle provision with its attendant equipment.



Image 35: Belgrave Square





Map 5: Open Spaces



Sports / activity areas

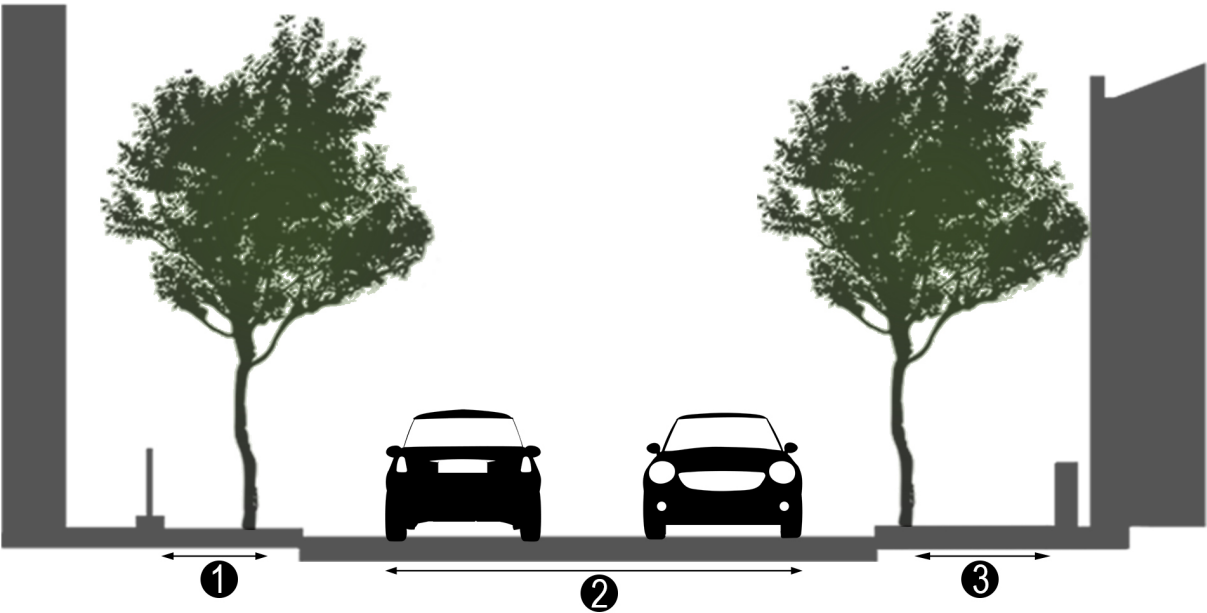
Where sports and other activity areas exist within open spaces they may be lit as they bring the benefit of activity and use of the facilities during hours of darkness and benefit the community. Such lighting must firstly ensure that the sport or task lighting is appropriate for the activity or sport being undertaken but must also look to the management and control of obtrusive light as previously discussed. Guidance on the required lighting levels may be obtained through the CIBSE Lighting Guide 4: Sports Lighting or the appropriate sports governing body.

In addition a local agreed curfew should be considered / imposed at which time the lighting is either turned off or reduced (if agreed) to a security level; this may be after 22:00 hrs for example.

Trees

Trees are an important and integral component of the Westminster public realm and street scene and the City of Westminster have announced a significant tree planting programme. When planning the installation of any item within the public realm due consultation and consideration of the other features must be made, perhaps more so for trees when considering the longer term and how they may grow. The effect of the trees during the various yearly seasons must also be considered, periods of when they are in leaf being of specific concern to the provision of lighting and the operation of the lighting control system.

However, trees are not appropriate in every location and caution needs to be exercised as to the places where they are planted. Trees and lighting are difficult bedfellows and require careful consideration as they affect street planning and maintenance as well as lighting design. Significant weight must be given to community and highway safety as well as the quality underfoot. Particular consideration should be made with regard to the public lighting provision such that trees do not adversely affect the purpose of the lighting to ensure that streets and public areas are lit to the Westminster Standard as illustrated in Diagram 1.



Key:

- ① Clear zone 1m minimum at a pinch
- ② Full clearance in middle of road (this should be 5m clear)
- ③ Clear zone 2m recommended, 1.5m in short runs

Diagram 1: Tree Planting and Public Lighting Considerations

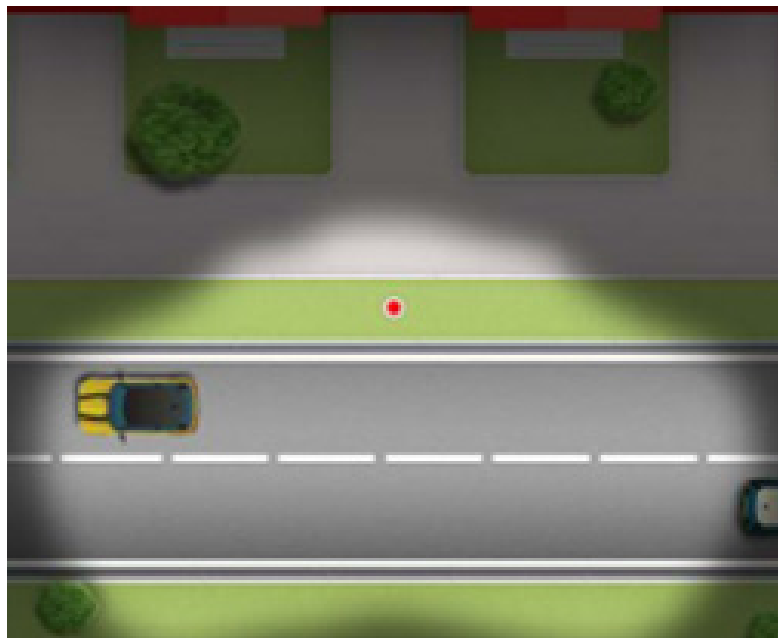
When considering trees and public lighting, careful choice of tree type and location should be made with respect to the way the street or area is lit or is to be lit. The best approach is to have trees located on one side of a street and the lighting on the other, however canopies still need to be maintained as they extend across the road and site conditions may not make this option feasible.



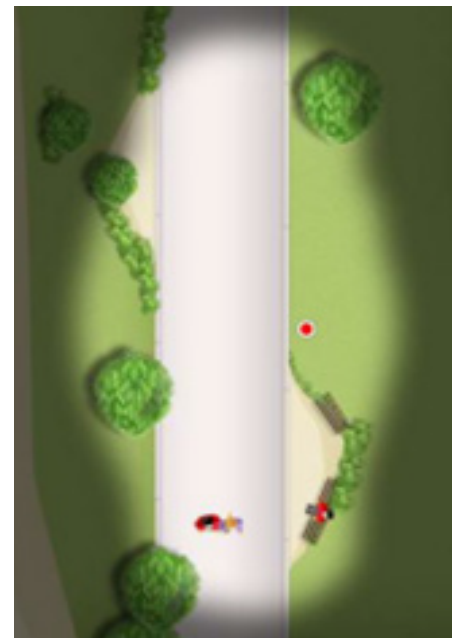
To aid an appreciation of the relationship between the public lighting service and trees it is important to understand a number of key aspects with regard to public realm lighting, for example how the area is lit and the lighting controlled. Essentially the light source is contained within a suitable luminaire which is chosen based upon style and appearance for the area as well as the performance of the optics within it. The optics essentially control where the light is placed on the lit surface, and luminaires can have a range of distributions as shown below.

The optical distributions are then calculated - based upon luminaire mounting height, road geometry and required lighting levels - to determine the column spacing such that the road or area is lit correctly. The lighting falling on any one point is not just associated with the luminaire closest to that point but also from adjacent units. Typically, a luminaire within five times the column mounting height will contribute to the lighting level achieved at any one point.

The luminaire distributions overlap to achieve the required performance and this is demonstrated in image 36 and 37.



**Image 36: Optical Footprint**



**Image 37: Optical Footprint**

The area being lit will vary from area to area but will include roads and adjacent footways, essentially lighting the street from the back of a footway or the boundaries of an open space, plaza or car park.

Where substantial mature trees exist, the canopy heights can be maintained and the lighting designed such that the luminaires are located under canopy height as can be seen below.

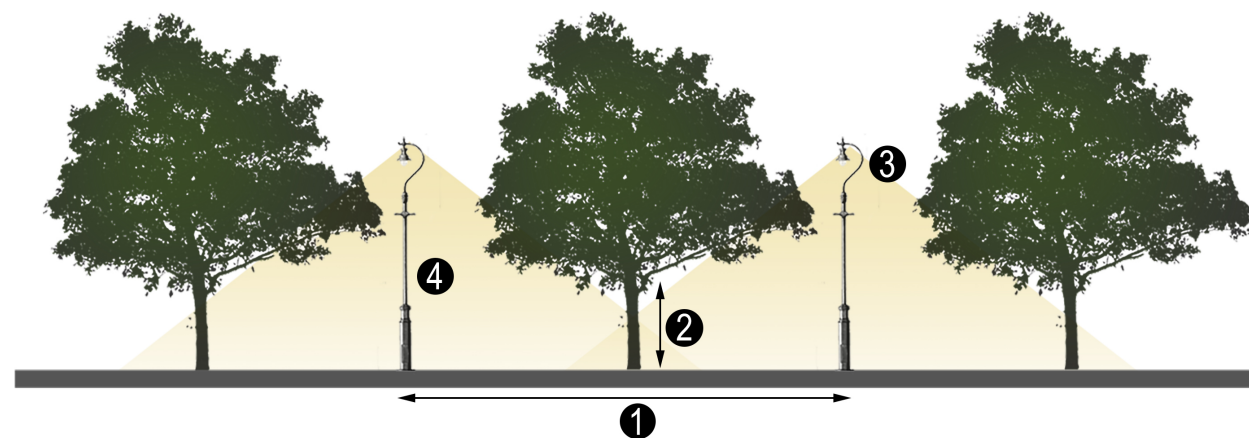
Where it is not considered possible for the trees and lighting to be segregated to different sides of the road then it is essential that the lighting which provides a safety and security function is fully considered with regard to tree type and location, especially as the trees mature.

Trees should therefore be situated using mid column spacing and preferably on a setback behind the columns, especially where the columns are fitted with post top luminaires rather than luminaires on brackets. Future and existing tree canopies should be considered from the aspect of luminaire distribution to enable the street / area to be lit. There will perhaps be a level of compromise required through discussion and at times due consideration may be given to changes to the existing lighting installation.

Those considering new lighting installations must also consider existing trees and to preferably locate columns away from trees (i.e. on the opposite side of the road) or design the lighting such that the trees and their canopies do not adversely affect the lighting performance. This may require discussion with the Westminster Arboricultural officers and subsequent pruning / pollarding recommended.

In all cases early consultation between the Westminster Public Lighting and Arboriculture officers / teams must be undertaken when either party is considering an installation so that the requirements of both parties can be considered and a working solution obtained.

Trees must be considered and maintained through careful choice of variety, location and maintenance. The following diagrams demonstrate areas to be kept free of foliage and branches in order to avoid interference with the street lighting performance and permit un-obstructed illumination of the carriageway and footway. As a rule of thumb the luminaire should be visible from the centre point between columns and this requirement should exist for at least the period between routine tree inspections and maintenance operations, as shown in Diagram 2 below.



Key:

- ① Column spacing and centre point varies
- ② 3.0m minimum height to tree at midpoint
- ③ 1.6m clearance above luminaire
- ④ Area to be kept clear of foliage or branches behind line of column

**Diagram 2: Lighting columns and tree maintenance**

## Fauna and flora

Lighting has the potential to have a negative impact on fauna and flora and therefore needs careful consideration.

Westminster has confirmed the presence of bats within the city. In areas such as Royal Parks and garden squares artificial lighting can affect their roosts as well as their foraging activities. Where the presence of bats is suspected a detailed bat survey should be considered following guidance within the Bat Conservation Trusts document 'Bat surveys; Good practice guide'. It should be noted that such surveys are best carried out at defined times of year when the bats are active and not in hibernation therefore this should be considered with the project plan.

Where bats may be present then due consideration will be given to National Guidance as published by the Bat Conservation Trust (<http://www.bats.org.uk/>) and the ILP for the application of lighting in areas where bats or bat flight routes are identified.

It should be noted that lighting adversely affects some tree types, such as the London plane tree in that the trees will not shed their leaves where the light falls upon them. Likewise, trees should be located and maintained to ensure that they avoid causing adverse effects to other services.

Many of the water features within the city have fish and other wildlife associated with them, not least the river Thames. Artificial lighting within the vicinity of all habitable water features needs to be carefully considered and an understanding of the flora and fauna associated with them understood as part of any adjacent or associated artificial lighting considerations.



## 12. LIGHTING ART/ FESTIVALS/ EVENTS

The use of lighting within the public realm to celebrate events such as Christmas, Chinese New Year and Diwali as well as special festivals and occasions is a developing trend especially during the winter months. These provide the opportunity to create interesting environments which encourage people and families out. This increases footfall with an associated economic benefit to the area and associated retailers.

Festive or decorative lighting is a welcome sight in Westminster's streets each year, particularly at Christmas. Today, however, there are many other festivals of ethnic or religious origin, which can be celebrated with lighting at various times of the year when the days are longer. Special effects involving lighting will also occur in connection with evening events throughout the year when the event itself might cause the lighting to be employed (premieres, first nights at theatres etc).

Westminster supports these festivals and events to showcase the city and encourage people out to enjoy the city and its environment at night.

Whilst recognising the pleasure a well-designed lighting display gives to the public, organisers and installers of festive lighting must keep in mind that such installations, when powered by mains electricity, are, because of their temporary nature, potentially hazardous. It must be remembered that outdoor lighting is subject to adverse weather conditions, especially in winter, and a hastily erected display could easily bring unnecessary risk instead of joy.

### Art

Westminster contains many art works and monuments, all of which create interest during the daytime as well as aiding way-finding; some of these merit consideration for lighting at night creating interest and visual impact. Often such installations and how they are considered demonstrate an investment in an area to which residents and business are proud.



**Image 38: Still Water, Sculpture Marble Arch**

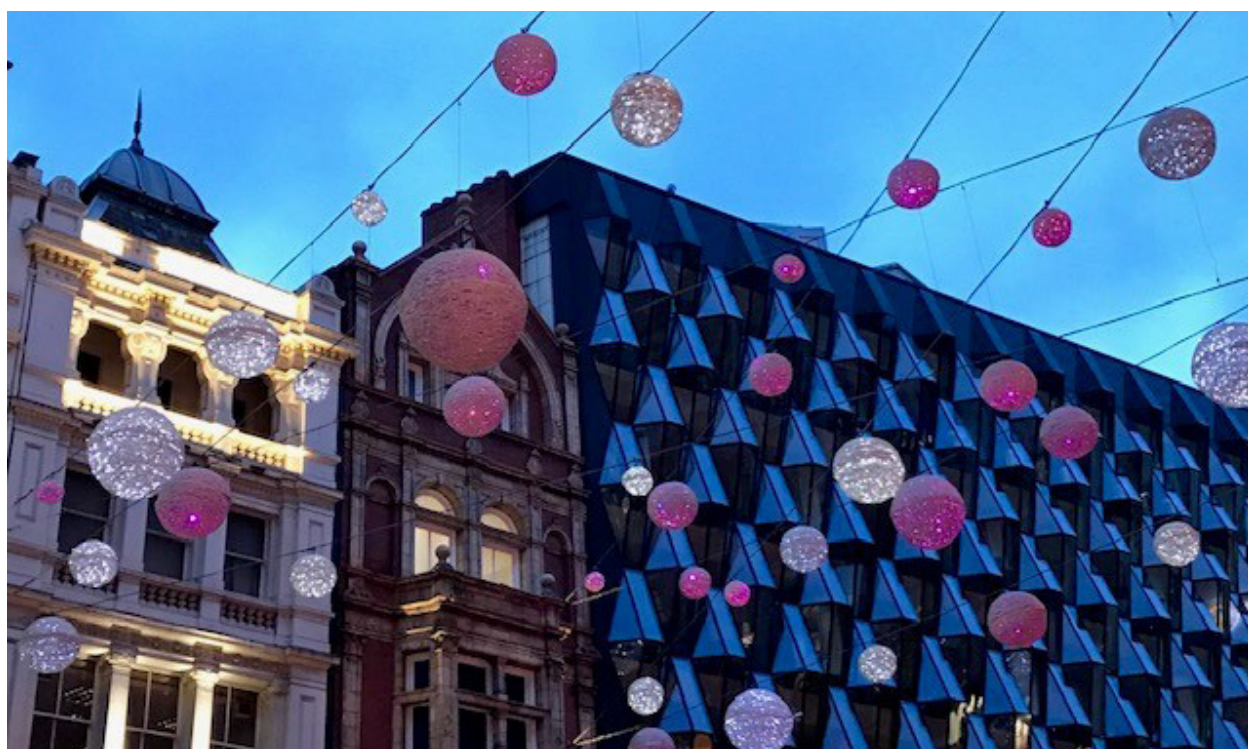
Temporary or permanent lighting of these sculptures in particular can be used to:

- Introduce a sense of the unusual, that this is a place where something is 'happening';
- Dramatically change the spatial identity and associations of an area.



## Festive lighting / events

The fundamental aim of any illuminated festive decoration is to provide a brighter and more interesting environment at night, creating an atmosphere that makes the location special for the occasion. The daytime appearance of the decoration is, however equally important and both aspects should be considered at the design stage. The delivery of such events requires due consideration for power, control and public safety. The city has a high background luminance and for some events there may be a consideration to dim the general public lighting to show the art / feature lighting to its best advantage, however the designer of such features should take this into consideration as part of their installation.

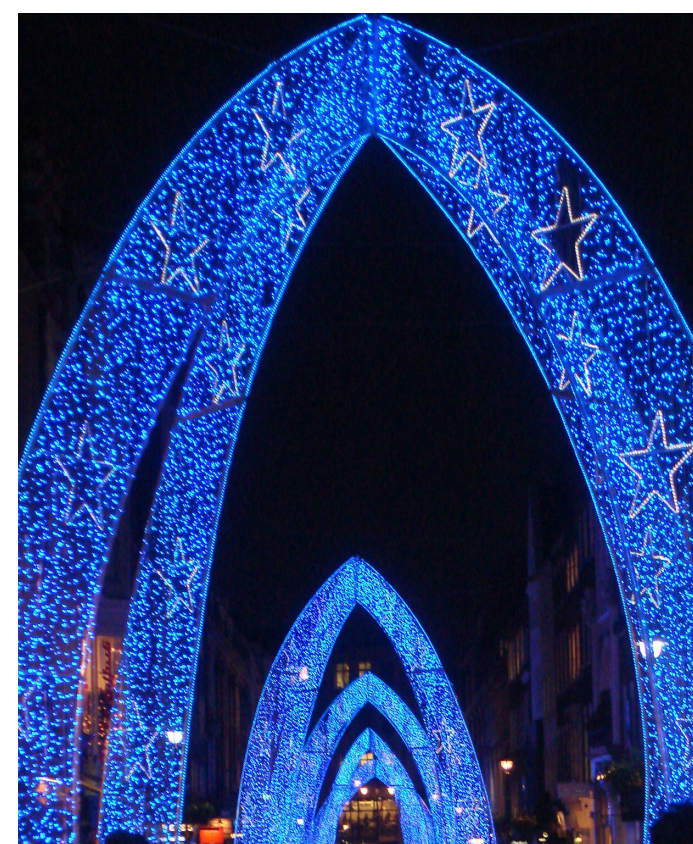


**Image 39: Festive Decorations**

Festive decorations can take various forms, a number of which are listed below:

- Simple festoon with multi-coloured light sources;
- Decorations mounted on poles or columns;

- Area spanning decorations mounted on catenary wire attached either to buildings or poles;
- Ground mounted features;
- Christmas trees;
- Additional effect lighting;
- Laser displays; and
- Projected displays from a remote location.



**Image 40: Festive Decorations**

Whoever instigates the erection of festive decorations, be it the council, traders' association, BID company, estate, Chamber of Commerce or other, (hereafter referred to as the 'Operator') that body assumes the main responsibility for Health and Safety. The Operator must ensure that the correct application process is followed and that all decorations are correctly supported and electrically safe and as such do not present a potential hazard to the public.



## Luminaire London

Luminaire London is a world-class light festival that takes place across London on a regular basis and showcases London's spectacular and iconic architecture and streets with over 50 works created by UK and international lighting artists. Luminaire London art works can be found in key Westminster locations such as Chinatown, Leicester Square, the National Theatre and Westminster Abbey.



**Image 41: Light Festival showcasing London's iconic architecture and streets**

The delivery of such festive and event lighting can range from a small local installation through to large scale co-ordinated schemes involving other aspects such as sound and digital information systems. All of these require suitable strategically located power supplies with the appropriate cabinets, cabling, metering, sockets and control systems.

Projection lighting can be effective for specific festivals and for use on certain buildings but its application as more than a temporary short-term installation needs to be carefully considered and in general will not be permitted.

## 13. MANAGING OBTRUSIVE LIGHT/ ECOLOGY

Westminster City Council, being mindful of its environmental responsibilities with regard to the provision and impact of artificial lighting wishes to ensure its application is undertaken appropriately across the city. If not undertaken appropriately lighting can have significant negative impacts on residents, businesses and visitors as well as the environment.

WCC has developed a process which can be applied to all external lighting schemes be they directly through Westminster or undertaken by third parties to ensure that the appropriate application of lighting is achieved.

The approach is inclusive of all external lighting be it public realm, advertising or for decorative / aesthetic reasons and will look to include provision for:

- Carbon and energy use, from the point of view of a whole life review process including manufacture, operational and disposal aspects
- Light pollution / sky glow
- Obtrusive light / Light nuisance
- Potential of any effect on wildlife, more applicable near parks, gardens and waterways



**Image 42: The impact of artificial lighting**

To ensure that the above requirements are met all lighting design should be carried out by competent lighting professionals and full design details supplied to the appropriate WCC department for approval prior to installation.

It should be noted that public realm / street lighting is not defined as being on a premise and as such does not come under obtrusive light impact with respect to nuisance. This is not to say that public realm / street lighting should not be designed to meet the best practicable means to limit its environmental and obtrusive lighting impacts. Public lighting is included within the review when considering energy, carbon use and light control.

A key aspect of any architectural scheme be it a façade, public area feature, monument and the like is that it is balanced within the streetscape, the lighting levels used. Light source and colour temperatures should be such that the finished lighting installation fits within the context of the street / public realm from the view point of the observers without the building / feature standing out or becoming a beacon.

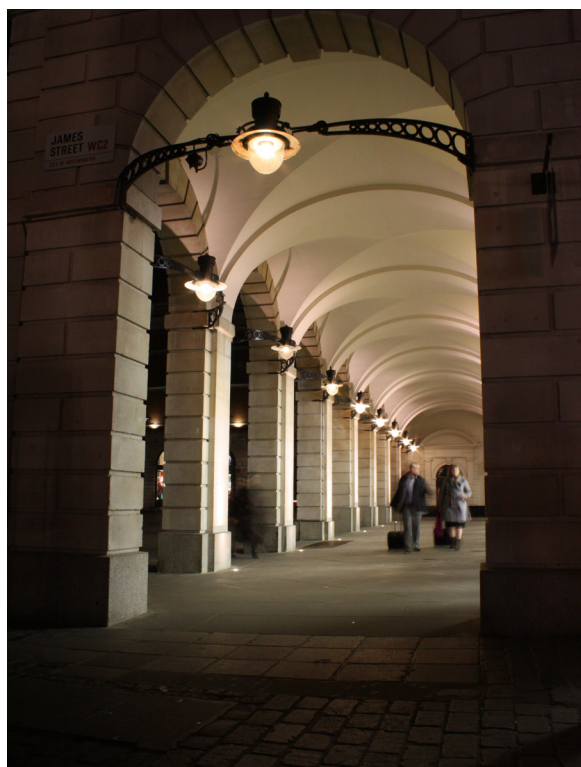
Such lighting should also be designed such that it does not become a nuisance nor contribute to the highway lighting.

### Post installation assessments

Most complaints arise not from the fact that lighting has been provided but due to it being incorrectly installed. Therefore it is important that all lighting installations are checked against the original specification and, where required, photometric measurements are taken to ensure that the required lighting levels, be they for the area being lit or limitations placed on the surrounding area, are achieved.

It is expected that the designer of any lit installation will review the installed lighting scheme, confirm that the products specified have been used, that they have been installed and set up / aimed as per the design and that all control systems are working and that the end user / client understands how to use them.



**Image 43: Gas Lighting Tour****Image 44: St Margaret's Church**

All lighting design shall be carried out by competent lighting designers as designated within this document.

An assessment of the likely significant environmental effects on sensitive receptors arising as a result of the installation of artificial external lighting associated with a proposed development should be undertaken. In particular the assessment should consider the potential for obtrusive light and light nuisance from the external lighting sources during construction and operation of the proposed development.

A survey of existing lighting levels at the site and in the surrounding area should be undertaken to inform this assessment and determine the base line conditions. The design information to be provided should indicate that lighting levels are in keeping with those of the environmental zone as defined by the Institution of Lighting Professionals (ILP).

When required, during construction for safe working, temporary lighting should be suitably designed and installed to the required lighting performance. The construction lighting should result in a negligible, temporary and medium-term effect. The requirements of such works are discussed in the temporary works section of this plan.

Any lighting needing to be installed for the construction phase should provide the correct lighting levels for the safety of both the construction workers and general users of the site.

Such lighting should comply with the requirements of the Environmental zone regarding obtrusive light and should be checked and signed off by a competent lighting professional.

The permanent operational external lighting should be designed to meet the performance requirements for the tasks being undertaken; this will include due consideration for zoning the lighting such that during hours of reduced use or at defined curfew times the lighting levels can be reduced. This will aid the provision of an energy efficient lighting installation whilst ensuring that safe operation levels are maintained. Through the choice of luminaire, mounting heights, locations and luminaire orientation the designer can ensure that the requirements for obtrusive light are met and that the installation does not present a nuisance or contribute to obtrusive light. The operational lighting should present negligible impacts that have a long-term effect.

The lighting shall be designed to suit the performance requirements of the areas being lit, this will include due consideration for reducing the lighting level when the use of that areas reduces i.e. during late evening when the car park is not as busy, a store is closed or at times of curfew.

Illuminated signage will only be used where required and will be designed to meet the requirements of the environment within which it is being used.



**Image 45: Shaftesbury Avenue**

Overall, if the lighting design has been created based upon the principal of best practicable means with regard to addressing obtrusive light and light nuisance then the installation should result in a negligible long-term, permanent or direct residual effect on sensitive receptors.

The lighting designer shall attend the commissioning of the installation to confirm that it has been installed as per the design and a compliance certificate shall be provided by the designer.

### **Office / building internal lighting**

A major source of artificial lighting's negative impact across central London is created by internal lighting within buildings; for example, office block lighting remaining on all night even when there are no occupants within the building. The owners and users of such properties are encouraged to use artificial lighting and hence electricity responsibly and sustainably. This can be achieved using suitable controls or operating the lighting such that it meets the needs of the users.

### **Natural light / solar glare**

Whilst the Master Plan considers the application of artificial light the effects and use of natural daylight should not be ignored. Daylight is a free resource but it can be compromised or become a problem if due consideration to building design and street furniture is not given.

When contemplating any construction within the city due consideration shall be given to building finishes / surfaces and where these are of a reflective nature they shall be designed and constructed such that reflected daylight does not become a cause of disability glare to highway and transportation system users nor a source of discomfort glare to residents and businesses within the city.

By similar consideration where structures cover the highway / public realm they should be designed such that they facilitate the maximum use of daylight to avoid, so far as is practicable, the need for artificial lighting to be provided during the daytime.



## 14. SUSTAINABILITY

To be sustainable we must know the true costs of what we do, and these are generally hidden or ignored in favour of upfront costs. If these costs are disclosed and made meaningful and relevant, then we can look to whole life costing and sustainable lighting installations.

Sustainability must be balanced: looking at the task, considering social and economic as well as environmental aspects, looking to optimise existing assets whilst making selective investment in new ones. Within lighting you may well have heard the term Ultra Efficient Lighting (the '4 R's' mentioned previously), this is the right light, in the right place, at the right time, controlled by the right system, designed by competent designers taking a whole life costing approach.

This can be achieved by due consideration of:

- Competent lighting design with the right application of standards; the existing British Standards can be directly linked to the National Road Gazetteer thus providing the appropriate hierarchy to determine performance levels.
- Use of energy efficient equipment as defined under the Energy related Products (ErP) Directive for public lighting.
- A whole life costing approach shall consider the cost of equipment and construction as well as costs for the operation and maintenance of the installation taking account of energy and carbon as well as expected planned and reactive maintenance operations, this shall be based upon a 40 year asset life.

All public realm lighting shall be designed in accordance with the Westminster lighting design guide.

When a new or replacement lighting scheme is to be provided, that scheme shall be the most cost effective in terms of whole life costing, energy and carbon usage.

### Equipment

Luminaires and associated equipment shall be of a style to suit their support and comply with the EU Circular Economy requirements in that they shall be serviceable, upgradable and maintainable throughout their operational life. Equipment that does not meet this requirement shall not be used.

Electrical equipment for highway connections shall have been assessed by Elexon<sup>4</sup> and have associated energy codes in order to meet un-metered equipment requirements. Equipment not holding such certification shall not be used or shall attract a commuted sum to manage the requirement for a metered electrical connection and supporting infrastructure.

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<sup>4</sup> Elexon administer the Balancing and Settlement Code (BSC) and provide and procure the services needed to implement them <https://www.elexon.co.uk/>

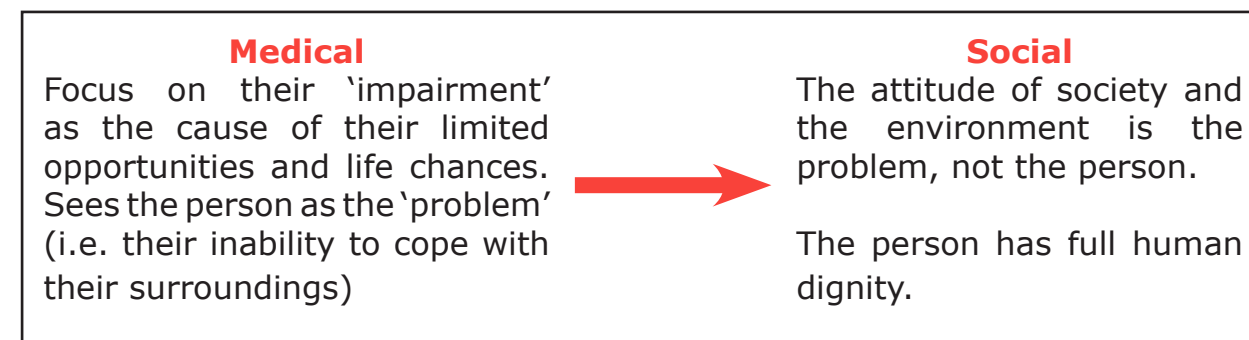
## 15. DIVERSITY/ INCLUSION/ EQUALITY

### Equality Act 2010

The Equality Act 2010 requires a duty of care to accommodate everyone's needs in all schemes and developments (subject to reasonableness). The main groups that we typically need to consider most often in terms of transport are:

- Disability;
- Age; and
- Language

All groups would feature in terms of safety such as the installation of CCTV, ensuring all users can use the footway without having to cross the road / enter the carriageway to get around objects such as columns.



Some considerations:

- Only 5% of disabled people use a wheelchair (and half of these can travel short distances out of their wheelchair);
- 1 in 8 people are employed at night (which is also disproportionately female);
- Can't design just for day (In winter, dark by 4pm);
- Lighting can be controlled to encourage activities and enable infrastructure at night (i.e. Maximise the opportunity for night time activities);
- Darkness precludes usage, especially if in sharp contrast with surrounding environment (e.g. Leicester Square Gardens); and
- Light is fundamental to the infrastructure for urban inclusivity, clearance zones shown on Diagram 3.



Key:

- ① Street furniture zone
- ② Pedestrian clear zone
- ③ Street furniture zone
- ④ 450mm kerb clearance zone

**Diagram 3: Clearance Zones**

The lighting design needs to take into account potential users' physical difficulties, gender and sensory impairment requirements. Visually impaired people need a good level of lighting in and around transport points and, if information such as a bus timetable is displayed, a print size that they can



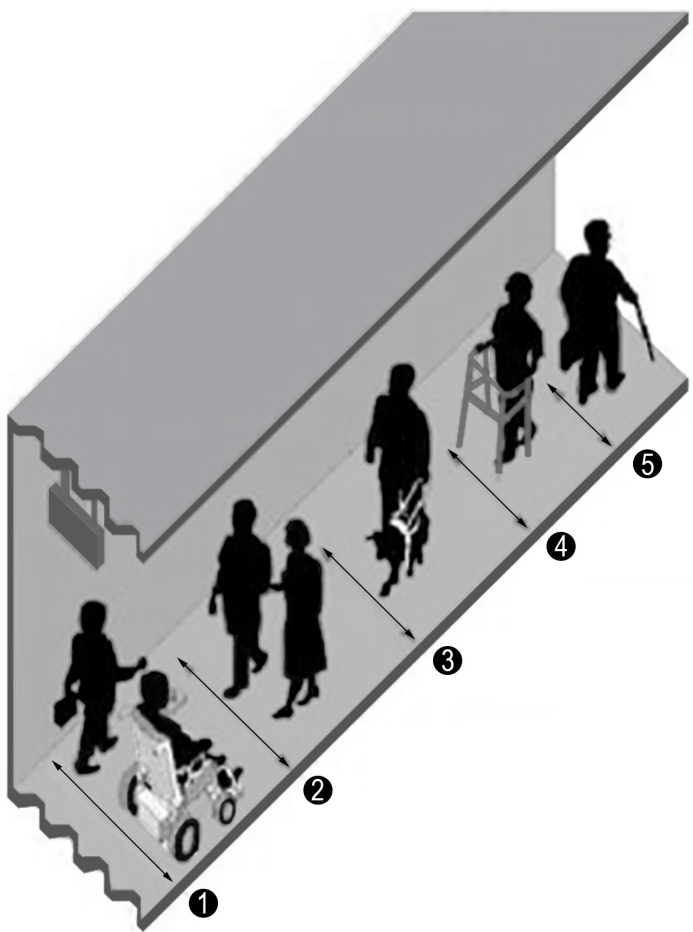
read easily. But almost everyone else benefits from good lighting, not least because it gives a greater sense of security, and practically everyone finds reading timetables easier if the print is clear and large.

As with bus shelters, bus stops should be well lit with sufficient illumination to enable reading. A good level of lighting will also improve personal security.

The lighting levels and equipment proposed should align to the Westminster lighting standard and diversity / inclusion access requirements.

The above addresses the diverse range of user concerns over:

- Crime and anti-social behaviour when going out at night;
- Night-time traffic accidents; and
- Trip, slips and falls accidents.



Key

- ① A wheelchair user or an ambulant person side by side need 1300mm
- ② A visually impaired person who is being guided requires 1200mm
- ③ Blind person with long cane or assistance dog requires 1100mm
- ④ Person with crutches or walking frame requires 900mm
- ⑤ Person with walking stick requires 750mm

Diagram 4: Pedestrian comfort and equality of access

Users should be considered by mode of transport (motorist, passenger, cyclists, walker etc), age, mobility, disability, race, religion / belief, sex, sexual orientation, pregnancy & maternity and relationship. Although it is debatable as to how lighting could / could not affect some of these groups.

Due consideration shall be given within the design to enable all persons of all abilities to be able to safely navigate the street; this will include wheel chair access clearances along footpaths and may therefore require due consideration for wall mounted luminaires. The guidelines within the London Local Authority and Transport for London Act 2013 – Part 2 Section 4 'Lighting Attachments and Street Signs' <sup>5</sup> empowers the City of Westminster to install lights and signs on buildings to reducing the need to erect columns on the pavement, which means walkways will be safer for people with impaired vision or mobility by reducing the number of obstacles they encounter, hence improving pedestrian comfort and equality of access.

### **Crime & Disorder Act**

Section 17 of the Crime and Disorder Act 1998 creates a general duty upon each local authority to take account of community safety in all areas of its work. 'Without prejudice to any other obligation imposed on it, it shall be the duty of each authority to which this section applies to exercise its various functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent, crime and disorder in its area.'

Metropolitan Police website <sup>6</sup> gives access to crime statistics for the city.

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<sup>5</sup> [http://www.legislation.gov.uk/ukla/2013/5/pdfs/ukla\\_20130005\\_en.pdf](http://www.legislation.gov.uk/ukla/2013/5/pdfs/ukla_20130005_en.pdf)

<sup>6</sup> <https://www.police.uk/metropolitan/>



## 16. TEMPORARY WORKS

### Scaffolding and hoardings

The City of Westminster is a constantly changing environment with public realm, building refurbishments and new developments altering and evolving the city environment. Many of these building works will inevitably require scaffolding, sheeting and hoarding to be deployed within the Highway.

This section describes the requirements with regard to the public lighting service to ensure that the provision of artificial light to the highway and public realm is not adversely affected by such installations.

The principle behind this section is to aid application to the City Council for a "Scaffolding" or "Hoarding" installation to ensure that its effect on the Public Highway and or highway services such as public lighting is managed. By following the processes laid out, appropriate solutions can be agreed to the meet the needs of the development whilst not adversely affecting the lighting services.



**Image 46: Hoarding affecting the performance of column lighting**

Essentially where any scaffolding or hoarding is being considered the design, construction and maintenance of it must take into account the public lighting service and look to ensure it is not adversely affected by the works.

The public lighting service must be continuously maintained in order that the public realm remains safe. Therefore, where lighting assets remain in situ, full access must be really available from the highway.

In some instances where wall mounted luminaires or columns will become inaccessible and / or will not be able to fulfil their function, these features may be removed or decommissioned and temporary lighting installed that meets the existing performance criteria.

It should be noted that the performance of any lighting asset has the potential to be affected if it is within a longitudinal distance of 50 metres either side of the limits of any scaffolding / hoarding. Any temporary lighting will need to be designed by competent lighting professionals and in compliance with the Westminster lighting design guide. Such installations must then be installed and commissioned by a competent contractor.

In some instances where wall mounted luminaires or columns will become inaccessible and / or will not be able to fulfil their function, these features may be removed or decommissioned and temporary lighting installed that meets the existing performance criteria.

It may be acceptable for a lighting column to remain in situ and operational depending upon its location, provided that the luminaire can still fulfil its function and correctly light the area(s) concerned.

However, scaffolding placed near street lamps or illuminated signs have resulted in a few serious but non-fatal accidents in recent years where live, electrically-fed apparatus has been touched by scaffolding operatives resulting in a burns and electric shock.

To ensure these accidents are not repeated and to better protect our assets during building works, it is proposed that scaffolds must be 2 metres clear of an electrically fed asset (EFA). Due to the nature of the streets in Westminster and the types of structure that need to be built, this is often not possible.



## Special consideration areas

### Construction lighting

It is assumed that industry standard lighting required for the construction phase will be implemented; as such the following mitigation measures will be followed as a minimum:

- Any lighting that will need to be installed for the construction phase will need to provide the correct lighting levels for the safety of both the construction workers and general users of the Site.
- Lighting installed for the construction site will need to be designed such that where possible all luminaires are mounted within the site hoarding and are directed into the working area and should only be operational during construction works. A level of lighting may be needed for security purposes.
- Any temporary lighting for the users of the Site should be provided at a level not lower than is required under the CIBSE guidance documents to provide a safe working environment. Where temporary luminaires are required these should be carefully selected for the task required and a photometric design undertaken to ensure it complies with the relevant obtrusive lighting guidance.

Good practice guidance documents prepared by the Construction Industry Research and Information Association (CIRIA) note that lighting on construction sites is typically required as part of on-site security and health and safety requirements. However, the online CIRIA Guidance (<http://www.ciria.org/complianceplus/>) also notes that potential effects towards surrounding receptors need to be minimised through the controlled application of lighting in accordance with current best practice standards.

### Covered footways

It has become the norm to extend scaffolding structures over the footway with a support section located adjacent to the carriageway kerb. Quite often these arrangements are then covered in a hoarding for aesthetic and safety reasons.

Such structures essentially create short pedestrian tunnels and may include access arrangements to the building or construction site concerned.

It is important that such structures are considered from a lighting perspective and a good level of lighting provided which, due to ambient lighting levels, may be required to be of a higher level during the daytime than at night.

The lighting and materials used for the hoarding must be carefully considered and designed to meet the needs of the users. The following images show various sites around Westminster that are examples of good and bad practice. Essentially the main differentiator is the use of white and reflective surfaces and, if looked at closely, the tunnels with the lighter surface finishes require less artificial light. Being able to incorporate a level of daylight is always beneficial.



Image 47: Example of good practice



Image 48: Example of poor practice



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## **Hoardings**

The same approach can be applied to hoardings surrounding a development. Here again the use of a reflective light coloured surface makes all the difference to how the area is lit and therefore how users feel about it; this is especially relevant to pedestrians' and cyclists' perception of crime and their fear of crime. Examples of bad practices around the West End of London have caused concern to the Met Police over their ability to undertake surveillance, crime and perception of crime within the area.



## 17. CONSTRUCTION AND MAINTENANCE

It is important that the lighting installations can be readily accessed by standard plant and equipment for maintenance purposes. In the past several installations have located luminaires high upon building façades which have been inaccessible by standard maintenance contract access equipment. This has resulted in the need for specialist equipment as well as road closures to undertake any maintenance activities. Another example of a poor maintenance consideration includes festoon lighting designed and installed below the functional road lighting and preventing access to the lighting installation.

Where vehicle access is limited or not possible then fold down columns shall be considered.

The designer must ensure that through their design and risk analysis that the lighting installation can be installed and maintained safely. This includes ensuring that all equipment can be easily maintainable through the use of contract standard access systems / plant with minimum disruption to motorists, pedestrians and access to premises and unless a departure from standards has been agreed. Such arrangements and the need for specialist maintenance equipment may attract a commuted sum.

Such approaches will ensure that the lighting installations will be easily maintained as design and if vandalism can be effectively repaired.



Image 49: Specialist tower wagon required to access wall mounted lighting



Image 50: Belgrave Square



Image 51: Belgrave Square



## 18. FUTURE READY

There is increasing pressure on lighting column asset owners for new equipment to be added into the street scene. Each of these could be added on its own column or support. However, under 'Well Managed Highway Infrastructure – A code of practice' there is a strategic move towards reducing the roadside clutter. This encourages the equipment to be added to existing structures such as lighting columns but these shall be structurally assessed beforehand and the broader planning and approval issues resolved.

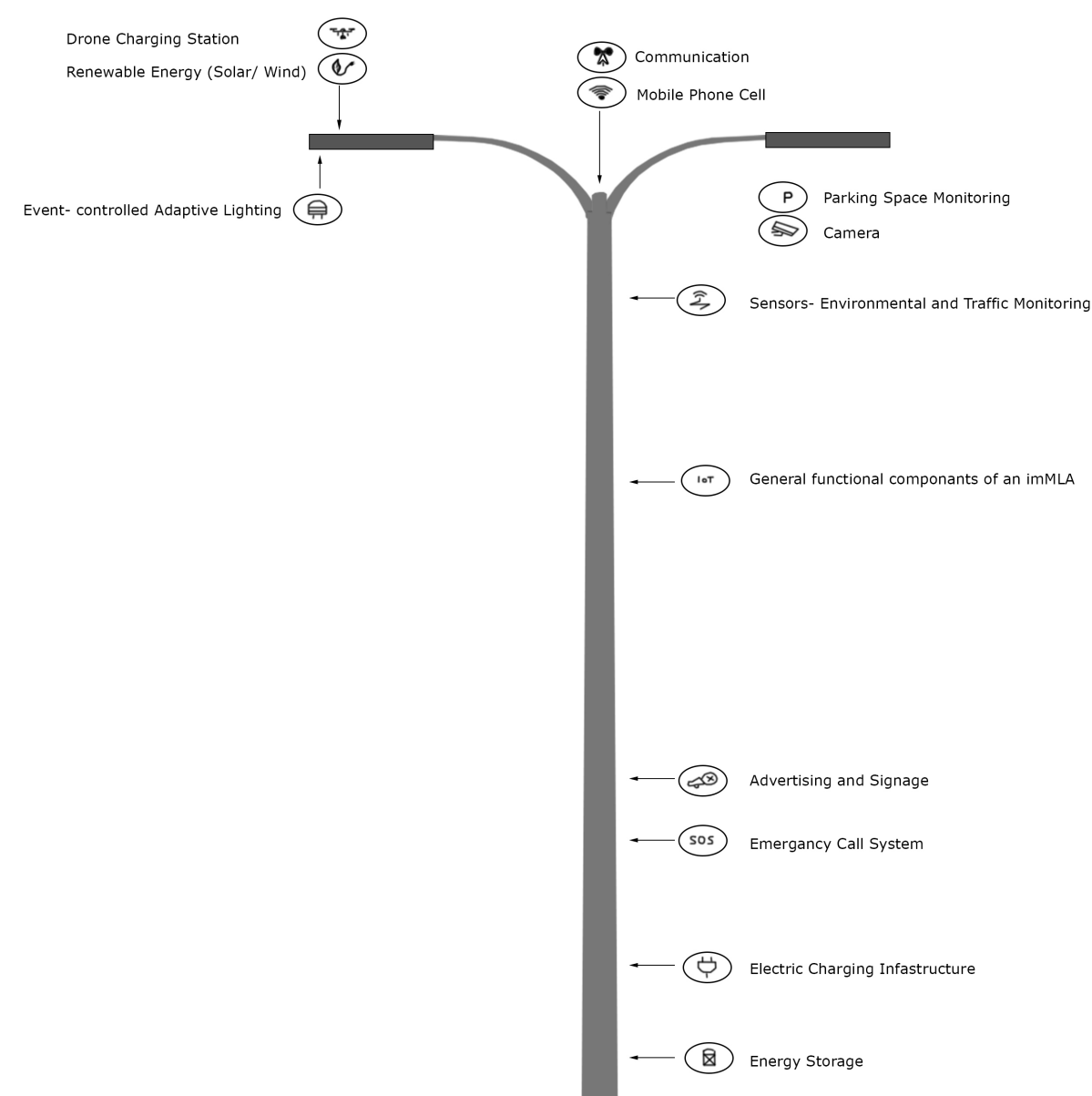
Lighting columns are normally designed specifically for the luminaires and signs that are attached to them using British and European Standard BS EN 40 Lighting Columns<sup>7</sup>. The design criteria of the column will also vary by location in the UK as outlined in PD 6547<sup>8</sup>.

As the sector moves forward it is foreseeable that the humble lighting column will be a facilitator for other infrastructure such as that relating to Smart cities. Considering the installation life of a lighting column they should be considered and assessed as to future loads they, as minor structures, need to support. What may be a 'bespoke' column now may be the standard column in a few years' time.

It is not possible to visually inspect an existing column to confirm whether or not a new attachment can be added safely therefore design calculations are required to show if a lighting column still meets BS EN 40 with the proposed attachment(s) in place and if such attachments adversely affect the expected life of that asset, in which case the financial risk to Westminster shall be covered through a commuted sum or require a long-term management plan with costs covered by the developer.

<sup>7</sup> Or its superseded versions e.g. BS 5649.

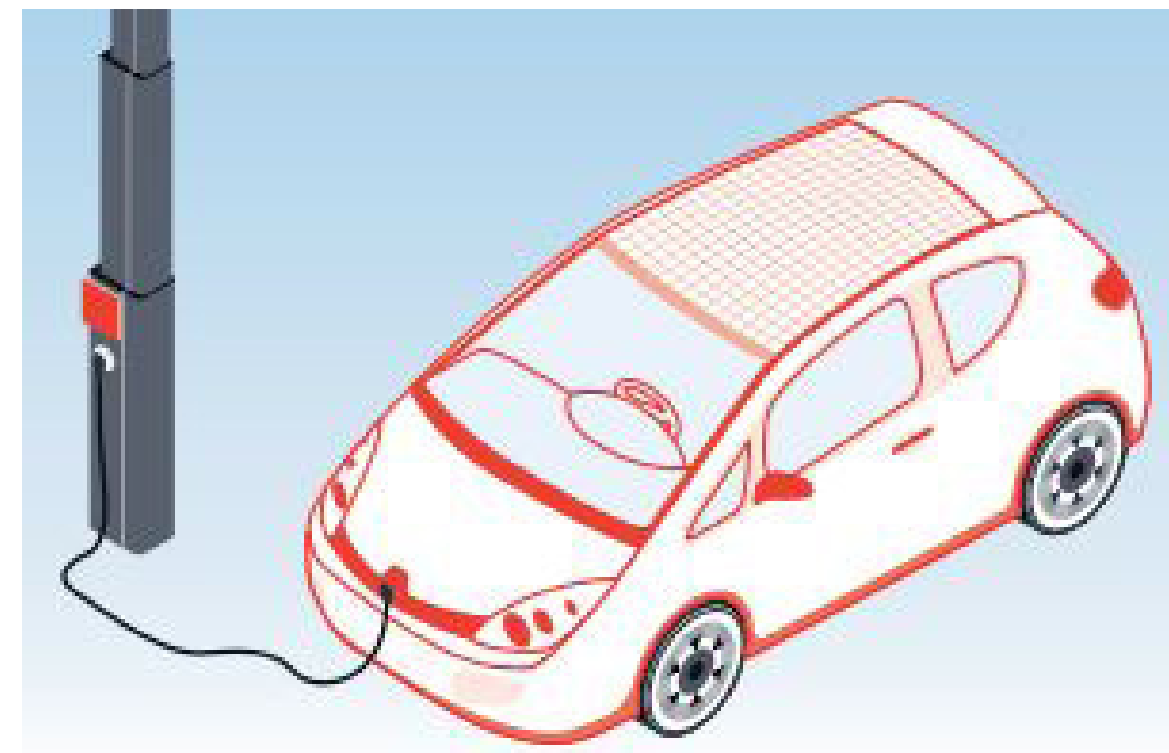
<sup>8</sup> PD6547:2004+A1:2009 Guidance on the use of BS EN 40-3-1 and BS EN 40-3-3.



**Diagram 5: Future Ready Lighting Column**

In order to manage the column asset condition Westminster has an approval and licence issuing process for applicants to follow in order to attach new and third party equipment. This is required for a number of reasons:

- To ensure the minor structure is not overloaded, given the weight and wind area for the attachment;
- To ensure any electrical load is covered from the point of view of:
- Energy payment (most columns are un-metered);
- Methods of attaching and gaining (where required) an electrical connection;
- To ensure that the column has the correct type of electrical supply in compliance with the IET Guide for Electrical Street Furniture;
- Where relevant, ensuring the equipment is fail-safe in the event of a column collision. This should be both electrically safe and that transmitting antennae are isolated;
- Contact details for unscheduled maintenance and emergency call outs are recorded against the asset in the asset database. e.g. in the event of the column being struck by a car, who should be contacted to deactivate the equipment and make it safe, prior to repairs;
- That suitable warnings are evident for those accessing and maintaining the luminaire and other attachments to ensure workers are aware of any access restrictions resulting from each of the pieces of equipment on the column e.g. the need to arrange an outage to turn off transmitting antennae before proceeding; and
- To ensure suitable insurances are in place.



**Image 52: Incorporation of electric car charging point within the lighting column**

### New technologies

The lighting industry has seen and continues to see great developments in lighting technologies, be they:

- LEDs
- Electronic control gear
- Central Management Systems
- New sign technologies
- Developments in materials such as sign reflective systems or protective coatings

All of these have the possibility of bringing benefit and efficiencies to the Westminster public lighting service. The technologies discussed within the master plan are not exhaustive and new technologies will be included if they provide a benefit to the lighting application and city. However, as the



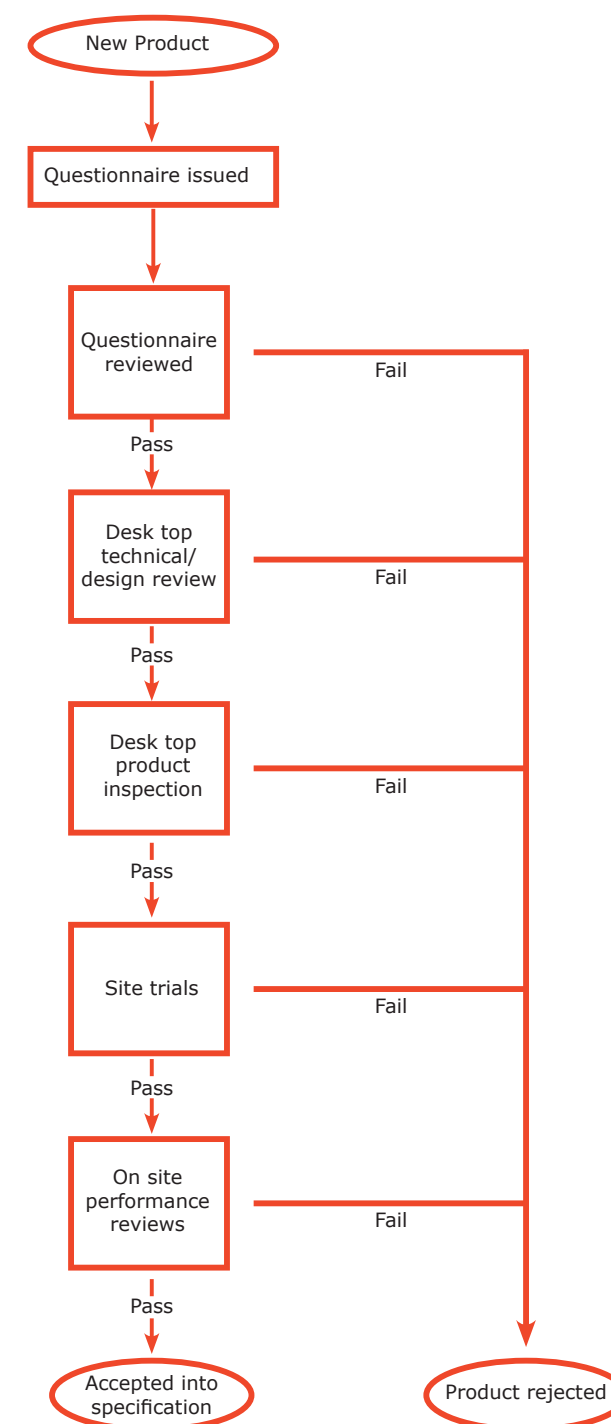
industry is seeing with LED products for example, there are many products being brought to the market or considered that do not meet the performance or quality requirements required either within the UK / EU or to meet / exceed the performance of existing products / services.

It is therefore important that working closely with Westminster Officers, a vetting process is applied.

Seeking feedback and lessons learnt from trials undertaken by other UK authorities is important in the vetting process as it will help City of Westminster make better informed decisions on future trials.

As such, all new technologies can be reviewed to ensure they meet the requirements before being considered for implementation within the city with minimum effect upon officer and contract staff time.

The adjacent flowchart 2 details the process to be followed when considering any new technology or product.



**Flowchart 2: Consideration process of any new technology or product**

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The process will essentially be driven by a product / technology specific questionnaire for the supplier to complete and return for desk top review; such a questionnaire has already been developed for LED lighting products by the IET and revised to suit Westminster's own performance requirements. Upon successful review the performance of the product will be evaluated to ensure that it meets the application requirements, i.e. the optical performance at least matches existing Westminster 'Standard' products and if successful the physical product will be inspected and checked for quality.

For those products that pass these stages, site trials will be considered where the products will be monitored and inspected for at least six months before being considered for acceptance into the Westminster specification.

This trial period will enable the technology / product to be reviewed against the baseline considering the viability, reliability and what improvements / benefits they will bring to the service, be it energy / carbon related and / or maintenance operations improvements reducing the impact of routine and reactive maintenance operations.

Products and technologies that are accepted into the Westminster specification / Westminster 'Standard' will then be considered for implementation through the asset management process.

Following this approach reduces the impact of contract and WCC officers' time allowing an efficient review of technologies and products as they enter the market.



## REFERENCES/ BIBLIOGRAPHY

### Westminster guidance documents

Westminster Way a Public realm guide  
 Public Lighting Maintenance Management Plan (PLMMP)  
 Artificial lighting environmental impact strategy (light pollution, obtrusive light, street scene and the effects of fauna and flora)  
 Lighting design guide  
 Lighting value management model (LVMM)  
 Lighting policy  
 Festive lighting guide  
 Third party attachments guidance  
 Cherished column strategy  
 Adaptive lighting strategy  
 Gas lighting strategy  
 Standard lighting equipment technical review  
 Guides for Banners, catenary systems, hanging baskets

### Clean Neighbourhoods and Environment Act (CNEA) 2005

The Clean Neighbourhoods and Environment Act (CNEA) 2005 gives Local Authorities and the Environment Agency additional powers to deal with a wide range of issues by classifying artificial light emitted from defined premises as a statutory nuisance.

The CNEA 2005 amends section 79(1) of the Environmental Protection Act 1990 to extend the statutory nuisance regime to include light nuisance stating the following:

‘(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance’.

Guidance produced on Sections 101 to 103 of the CNEA 2005 by DEFRA (DEFRA, April 2006) extends the duty on local authorities to ensure their areas are checked periodically for existing and potential sources of statutory nuisances including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light. Once satisfied that a statutory nuisance exists or may occur or recur, local authorities must issue an abatement notice

(in accordance with section 80(2) of the Environmental Protection Act 1990), requiring that the nuisance cease or be abated within a set timescale.

### National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) (Communities and Local Government, 2019) is the new national planning policy. It seeks to combine all the PPSs, Planning Policy Guides (PPGs) and Guidance notes into a single document. It promotes sustainable development and opportunities for local communities to engage in plan making at a neighbourhood level. The document was fully implemented in March 2012. The core underpinning principle of the new framework is the presumption in favour of sustainable development, defined as:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (Paragraph 9).

### International Guidance

Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, Commission Internationale De L’Eclairage (CIE 150 - International Commission on Illumination) (2003)

Guidelines for Minimising Sky Glow CIE 126 (1997)

### National Guidance

The Institution of Lighting Professionals (ILP, 2011) Guidance Notes for the Reduction of Obtrusive Light  
 Chartered Institute of Building Service Engineers (CIBSE) Lighting Guide 4 (LG4) Sports lighting  
 Chartered Institute of Building Service Engineers (CIBSE) Lighting Guide 6 (LG6) The exterior environment  
 Road to Zero document from the Transport Secretary  
 London Local Authority and Transport for London Act 2013 – Part 2  
 Section 4 ‘Lighting Attachments and Street Signs’



APPENDICES

Appendix A  
Westminster Street Inspection Hierarchy map





## Appendix B

### Existing column styles within Westminster



#### Small Grey Wornum

##### History:

Large Grey Wornum was originally designed by the famous architect George Grey Wornum for parliament Square in 1951. The small Grey Wornum was developed around 1958. Also available in Large (1.4) and Extra Large (1.5) versions.



Tatchbrook Street

##### General Description:

Small Grey Wornum  
5m or 6m Short Parliament Square  
Column, originally cast by Revo.

##### Materials:

Cast Iron and Steel

##### Colour:

Black with gold detail

##### Bracketry:

Post-top mounted

##### Suitable Luminaires:

Small Grey Wornum

##### Manufacturer(s):

D W Windsor, Metcraft, Urbis



##### Areas of Use:

All areas of the City not classed as Standard or Cherished – see Westminster Way for lighting areas.





City of Westminster

### Large Grey Wornum

#### History:

Originally designed by the famous architect George Grey Wornum for Parliament Square in 1951. Also available in Small (1.3) and Extra Large (1.5) versions. Modifications can be seen to accommodate traffic signals, CCTV and Wifi.



St James's Street

#### General Description:

Large Grey Wornum 8m Parliament Square Column with Embellishment Kit.

#### Materials:

Cast Iron and Steel

#### Colour:

Black with gold detail

#### Bracketry:

Post-top mounted

#### Suitable Luminaires:

Large Grey Wornum

#### Manufacturer(s):

Metcraft, Urbis



#### Areas of Use:

All areas of the City not classed as Standard or Cherished – see Westminster Way for lighting areas.





City of Westminster

### Extra Large Grey Wornum

#### History:

Large Grey Wornum originally designed by the famous architect George Grey Wornum for Parliament Square in 1951. Also available in Small and Large versions. Modifications can be seen to accommodate traffic signals, CCTV and Wifi.



St James's Street

#### General Description:

Extra Large Grey Wornum 10m Column with Embellishment Kit

#### Materials:

Cast Iron and Steel

#### Colour:

Black with gold detail

#### Bracketry:

Post-top mounted

#### Suitable Luminaires:

Extra Large Grey Wornum with single or double optic

#### Manufacturer(s):

Urbis



#### Areas of Use:

All areas of the City not classed as Standard or Cherished – see Westminster Way for lighting areas.





## City of Westminster

### St Martin- in- the Fields

#### History:

Ornate cast lamp column used only in the parish of St Martin in the Fields. Further replicas have been produced and the date indicated the provenance for the benefit of future generations.



*Strand*

#### General Description:

St Martin- in- the Fields

#### Height:

8m (excluding bracket)

#### Materials:

Cast Iron

#### Colour:

Black with red and gold detail

#### Bracketry:

Double bracket and extended double bracket for original smaller column

#### Suitable Luminaires:

Gladstone, Rochester

#### Manufacturer(s):

Metcraft



#### Areas of Use:

Parish of St Martin- in- the- Fields only







## City of Westminster

### George V Replica

#### History:

George V Eddystone was replicated for the use in the 1992 alterations to Leicester Square Gardens. This modern replica has a door for access and has no date, crest or monogram for the Monarch.



*Southampton Street*

#### General Description:

George V Replica

#### Height:

4m

#### Materials:

Cast Iron and Steel

#### Colour:

Black

#### Bracketry:

Post- top mounted

#### Suitable Luminaires:

Gladstone, Rochester

#### Manufacturer(s):

Sugg



#### Areas of Use:

Covent Garden and other locations where replicas of George V Eddystone columns are required with access doors.







City of Westminster

### Knightsbridge

#### History:

Originally produced by Suggs known as 1265, 10' in height. Replicas of this column are now produced by D W Windsor.



*Montpelier Square*

#### General Description:

Knightsbridge

#### Height:

5m

#### Materials:

Cast Iron

#### Colour:

Black

#### Bracketry:

Post- top mounted

#### Suitable Luminaires:

Windsor, Grosvenor, Rochester

#### Manufacturer(s):

D W Windsor



#### Areas of Use:

Residential Streets within conservation areas where there is an existing concentration of the same type







City of Westminster

### Mackenzie Moncur Original

#### History:

This heavy cast iron column has been used within the City since early 1900s originally manufactured by Scottish Ironfounders Mackenzie Bros, later Mackenzie & Moncur. Founded in 1850 they expanded their range in the mid 1890s to include electric street lighting. Replicas are now manufactured by Metcraft and Sugg.



Stanhope Gate

#### General Description:

Mackenzie Moncur (original)

#### Height:

8m

#### Materials:

Cast Iron and Steel

#### Colour:

Black with gold detail, White stripes (New and Old Bond Street only)

#### Bracketry:

Double bracket or single bracket with varying detail.

#### Suitable Luminaires:

Mackenzie Moncur

#### Manufacturer(s):

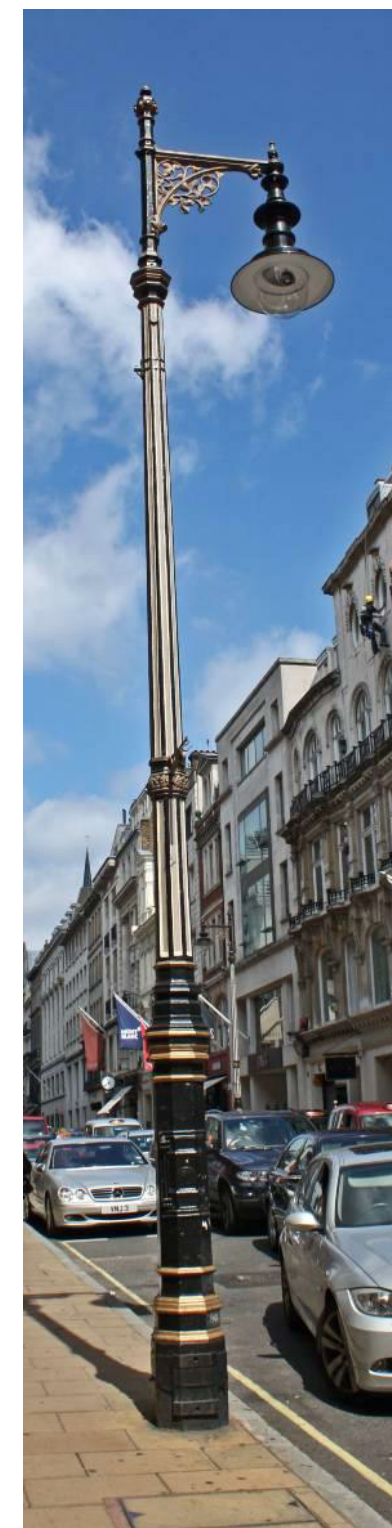
See Mackenzie Moncur (replica)



Note that two different lantern skirts are used on this column

#### Areas of Use:

Pimlico, Belgravia, Mayfair and Whitehall







## City of Westminster

### Mackenzie Moncur Replica

#### History:

This heavy cast iron column has been used within the City since early 1900s originally manufactured by Scottish Ironfounders Mackenzie Bros, later Mackenzie & Moncur. Founded in 1850 they expanded their range in the mid 1890s to include electric street lighting. Replicas are now manufactured by Metcraft and Sugg.



Whitehall Place

#### General Description:

Mackenzie Moncur (replica)

#### Height:

8m

#### Materials:

Cast Iron and Steel

#### Colour:

Black with gold detail

#### Bracketry:

Double bracket or single bracket (this new style bracket shown is an acceptable alternative to the original)

#### Suitable Luminaires:

Mackenzie Moncur

#### Manufacturer(s):

Mackenzie Moncur



#### Areas of Use:

Pimlico, Belgravia, Mayfair and Cambridge Circus







City of Westminster

### George V Eddystone

#### History:

1910 George V Eddystone column now replicated with a door added for access (see 1.8)



*Kings Street, Covent Garden*

#### General Description:

George V Eddystone Column

#### Height:

4m or 5m

#### Materials:

Cast Iron and Steel

#### Colour:

Black

#### Bracketry:

Post- top mounted

#### Suitable Luminaires:

Rochester, Windsor

#### Manufacturer(s):

Sugg



#### Areas of Use:

Historic locations including Covent Garden. This column is used in gas lit streets.







City of Westminster

## Chester

### History:

The Chester column is simple in design with a detailed section at the top of the base which is often painted gold. This is a modern take on heritage design but shall not be used for future schemes.



Queensway

### General Description:

Chester

### Height:

4m, 5m or 6m

### Materials:

Steel

### Colour:

Black

### Bracketry:

Post- top mounted

### Suitable Luminaires:

Windsor, Grosvenor

### Manufacturer(s):

D W Windsor



### Areas of Use:

Not to be used for future schemes. Small Grey Wornum columns (1.3) to replace existing.







Trafalgar Square Triple

**General Description:**  
Trafalgar Square Triple

**Materials:**  
Cast Iron  
**Colour:**  
Black and Gold  
**Bracketry:**  
Triple



Trafalgar Square



**Areas of Use:**  
Trafalgar Square







City of Westminster

### Sturgeon

#### History:

Mounted on the Victoria Embankment River Wall on the North Bank are 47 ornate cast iron columns mounted on plinths at approximately 22m spacings. The globe luminaires and festoons were refurbished in 2010/ 2011.



*Victoria Embankment*

#### General Description:

Sturgeon

#### Materials:

Cast Iron

#### Colour:

Black, Gold with silver and blue detail on crest

#### Bracketry:

Post- top mounted

#### Suitable Luminaires:

Large Globe

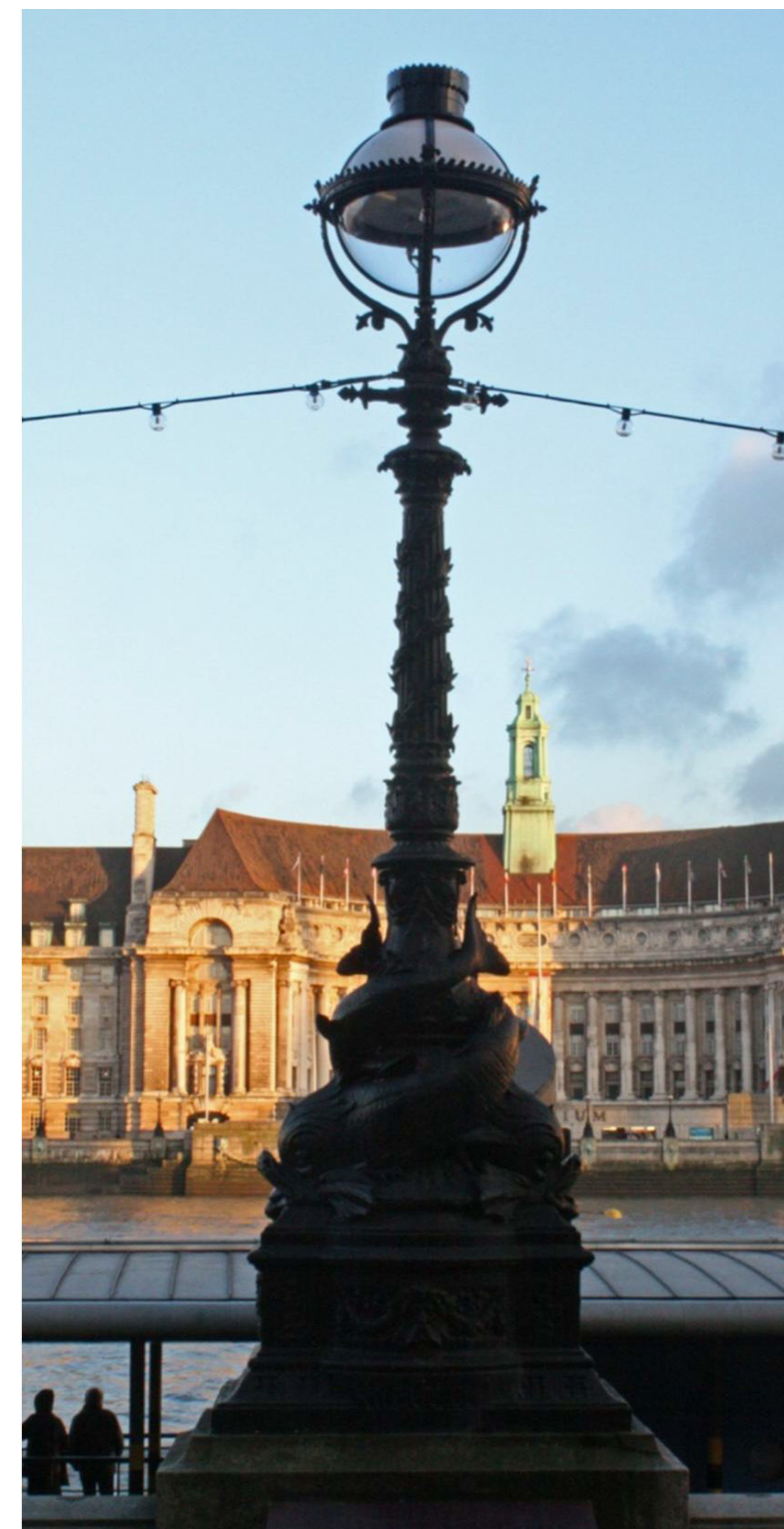
#### Manufacturer(s):

Clobes- D W Windsor. Festoons- Luminaires



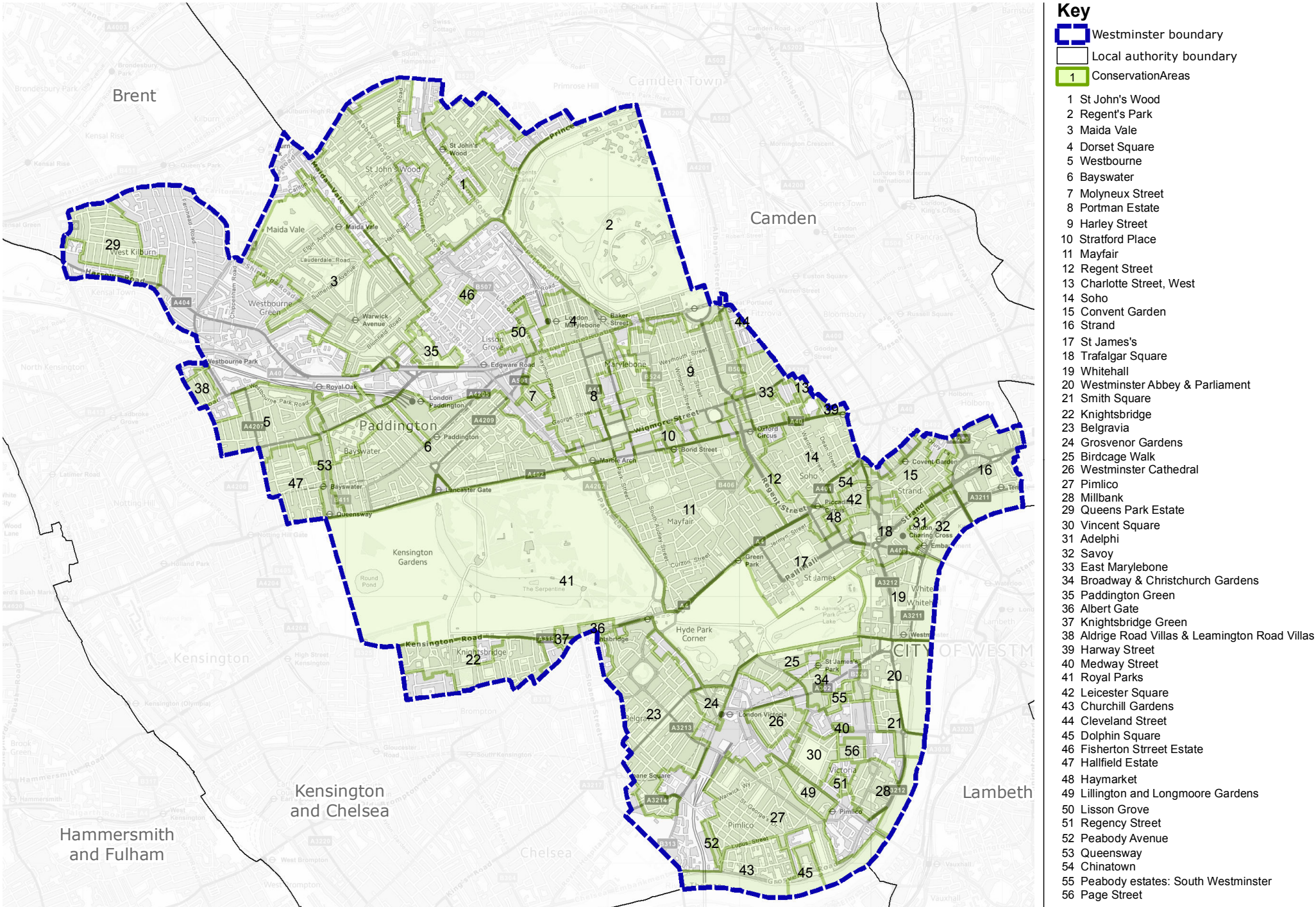
#### Areas of Use:

Victoria Embankment





Appendix C  
Conservation areas and listed buildings







City of Westminster