

# Sydney Lights Part Four

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## Creative Lighting Masterplan



Paddington Reservoir Gardens, Eric Sierins City of Sydney

# Creative Lighting Masterplan

## 4.1 Introduction

In addition to fulfilling functional lighting requirements this Code recognises the importance of lighting to reinforce a sense of place, influence the appearance and character of streetscapes, buildings, and public spaces, and contribute to a lively engaging city experience for people to enjoy.

Proposals for creative lighting applications are assessed by the City of Sydney on a case-by-case basis, taking into consideration the overall design, the site context, and compliance with the requirements of this Code.

## 4.2 Strategic Approach

To be energy efficient and visually effective the Code advocates a targeted use of creative lighting applications with the city's fabric appearing as a backdrop to selected highlighted places, precincts and elements. The Creative lighting applications comprise of three components:

### City Structure and Precincts

- lighting applications to reinforce the legibility of the city structure or highlight key city precincts;

### Distinctive accents

- lighting applications to individual elements across the city such as monuments, trees and landmark buildings

### Special Lighting Elements

- use of special non- standard lighting elements for functional lighting applications as a means to reinforce a distinctive sense of place and character;

## 4.3 City Structure and Precincts

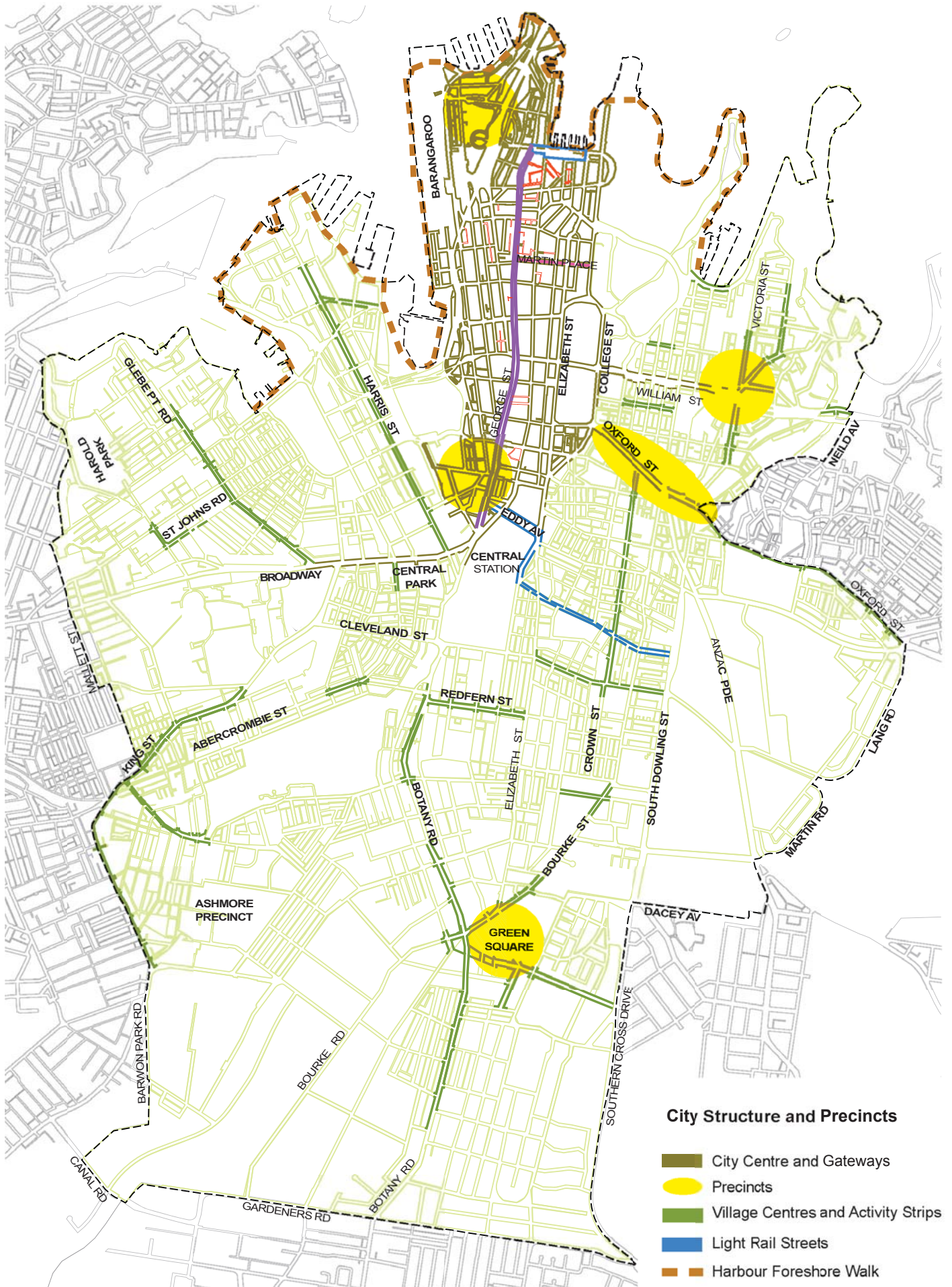
The overarching lighting strategy considers the pedestrian experience within the context of the night time environment. The following elements collectively facilitate the legibility of the city through illumination and navigation which can be read from afar, looking in, as well as at a pedestrian level.

### 4.3.1 City Centre Skyline

Major towers in the City Centre contribute to the identity of the City by providing a unique profile and expression of the skyline. Attention to building capitals and capping buildings with light has the most impact on the development of a strong night time skyline. The relationship between functional lighting applications, creative lighting applications and lighting for private developments needs to be considered and balanced to re-enforce the overall legibility of the city structure.

### Roof Top Illumination

- Care is to be taken in the methods of illumination to ensure that the City does not become over illuminated. The illumination of City buildings must be rationalised to effect a stronger, tidier appearance and in doing so create striking long-distance vistas of the City.
- Close attention is to be paid to building capitals, as 'capping' the building with light creates a strong night-time skyline.
- Techniques and fixtures that minimise upward spill light and energy consumption are to be employed.
- Development Applications are to demonstrate, by photomontage, the effect in the field of view from distant vantage points.
- Where uplighting is proposed evidence must be provided to demonstrate that no waste spill light or obtrusive effects will result and that downlighting is not possible in the circumstances.



### 4.3.2 Harbour Foreshore

#### Approach

Sydney's beauty is often defined by its harbour and foreshore. Lighting applications can reinforce important aspects of the city's relationship to the Harbour edge as well as promote the foreshore walk which acts as a linking element between existing and growing destinations such as Pyrmont, Darling Harbour, Barangaroo, Walsh Bay, The Rocks/Harbour Village North and Circular Quay.

#### Direction

The lighting strategy to the Foreshore walk should create an overall and consistent experience. Lighting should allow for experiencing the harbour at night-time in a safe and guided way, whilst allowing view across and to the water. Considerations shall be given to the use of low level pedestrian or furniture lighting to mark the water's edge whilst maintaining vistas.

The lighting scheme must acknowledge that the Foreshore walk land is not solely owned by the City of Sydney. The City of Sydney encourages the lighting strategy in this area to be adopted by other landowners to create consistency in the public domain.

### 4.3.3 Precincts & Village Main Streets

Primarily, the 'Lighting Overlay' strategy recognises Sydney as a network of distinctive precincts; each with their own unique program and identity. Together they provide a diverse range of attractions across the City.

These precincts are known as:

- Chinatown
- Harbour Village North
- Oxford Street
- Kings Cross
- Greensquare Town Centre

The lighting strategy in each precinct should be tailored to express the identity of the area. The full project scope and lighting applications will be subject to the preparation of individual lighting master plans for each distinctive City precinct.



Circular Quay Panorama, Vivid 2010, Paul Patterson / City of Sydney

## Chinatown

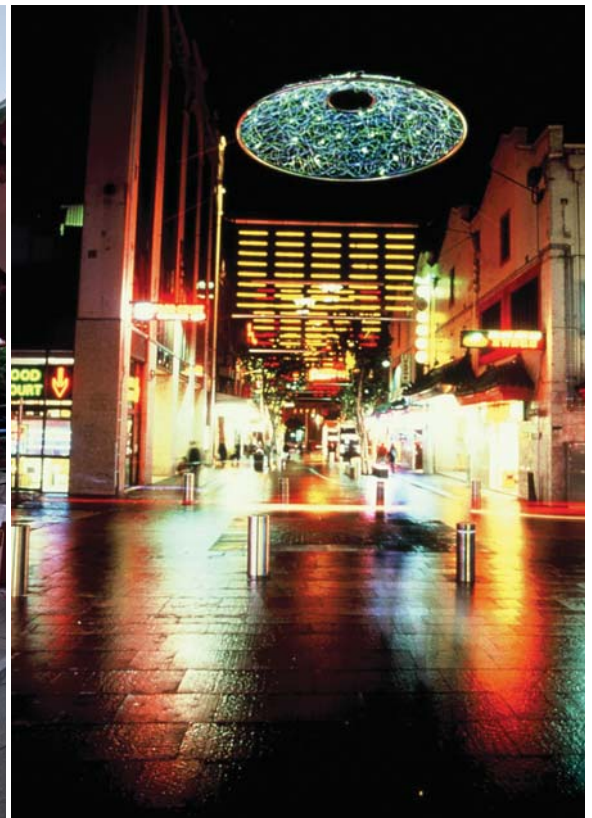
### Approach

Chinatown has a unique identity expressing the vibrancy of Asian Culture and street life in Sydney. Focused on the pedestrianised Dixon Street, small businesses from all over Asia owners populate the area in restaurants, food halls, stores, karaoke venues, bars and markets. This vibrant destination appeals to all age groups, residents and visitors during the day and in the evening.

### Direction

The significance of this dense community in the City provides the opportunity to allow for the layered growth of the illuminated advertising which has become a hallmark of the contemporary Asian metropolis.

The area will offer a lighting destination, distinct in that it is not controlled design but ordered chaos. This allows the community and businesses to help define the development of their own unique precinct. The Hong Kong or Shibuya experience being brought to Sydney.



Chinatown, google search, photographer unknown

Chinatown, artist's impression, McGregor Coxall

## Harbour Village North

### Approach

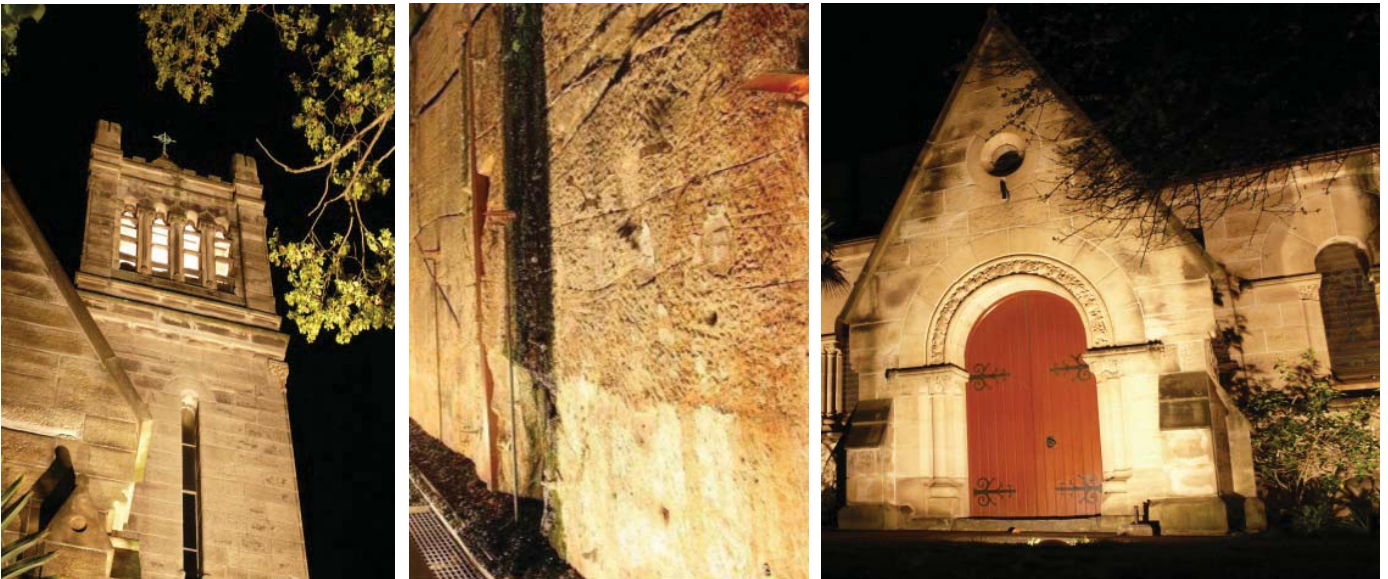
The Harbour Village North and surrounding areas, offer a precinct rich with architectural history, typologies closely weaved in together expressing the city's past in a dense, reminiscent spatial environment unlike any other in Sydney. The opulence of history witnessed in this built environment is prevalent in buildings, ground treatment and even immense infrastructural feats. Coupled with its harbour side location and the precincts role as portal for international visitors, the Harbour Village North has a purely distinct character. This area provides an unparalleled opportunity to celebrate heritage through lighting in a means that can tell a story and enhance Sydney's historical narrative from the very origin point of its development. Curated by the City and characterised by the warmth of illuminated Australian sandstone, this controlled environment provides a place in the urban strategy, which can become an evening destination appealing to a variety of age groups.

### Direction

The lighting strategy in this area is focussing on subtle and warm building façade lighting to enhance heritage features of the built and landscaped environment. The façade lighting needs to consider and respect the heritage fabric of the buildings, and will be supplemented by street and pathway lighting.

Non heritage buildings may be lit from within to distinguish these from heritage buildings.

The lighting in this area must consider SHFA guidelines for the adjacent Rocks area.



Harbour Village North, Paul Patterson / City of Sydney

## Oxford Street

### Approach

Oxford Street describes the rich development of culture capable within a progressive and active city. This distinct night oriented corridor is home to a highly expressive and celebrated gay community who alongside the many other locals generate a hive of evening activity. The mood of this region is distinct within Australian nightlife populated by a huge diversity of characters growing particularly towards later hours of the evening. This segment of the urban strategy looks at a curated, controlled yet highly expressive and changeable lighting environment. The environment would be distinct, channelling the vibrancy and uniqueness inherent in the local community. The dynamic nature of this region would be further expressed through changing curatorial roles and a lighting scheme which is able to respond to the mood of streetscape across different times of the day/ year.

### Direction

The lighting strategy in this area is to consider and include the following elements

- Ability to change lighting scheme or certain features of scheme on a regular (yearly) basis
- Use of catenary lighting which includes a curated light art element
- Consideration of lighting projections if suitable to the curated installation



Oxford Street, artist's impression, McGregor Coxall



Claire Scoville *Dancer.Jordan*, 2010, NYC, google search, photographer unknown



Karim Rashid *Dnarim*, 2010, Milan, google search, photographer unknown



# 4

## Kings Cross

### Approach

Kings cross is Sydney's home of illuminated icons. From known landmarks such as the CocaCola Sign and the El Alamein Fountain to neon signage, exaggeration dominates the senses. This highly accessible, night oriented area while being known as Sydney's Red light districts is also the location of countless of evening destinations which provide an attraction for locals all over Sydney.

### Direction

The lighting strategy for Kings Cross is to respond to the tone of the night's activity cycle, helping facilitate active hours and soften the mood of the area outside these periods.

The lighting strategy in this area is to combine various lighting elements into a holistic strategy, and should consider and integrate the use of catenary lighting installations in specific circumstances, façade lighting and coloured illuminated signage. The focus of the overlay should be concentrated along Darlinghurst Road / Bayswater Road entertainment precincts.

Peter McGregor *Llankelly Place Lights*, 2001, Kings Cross



Kings Cross, artist's impression, McGregor Coxall 2001, Kings Cross



Newell Harry *Circles in the Round*, 2010, Temperance Lane



## Green Square Town Centre

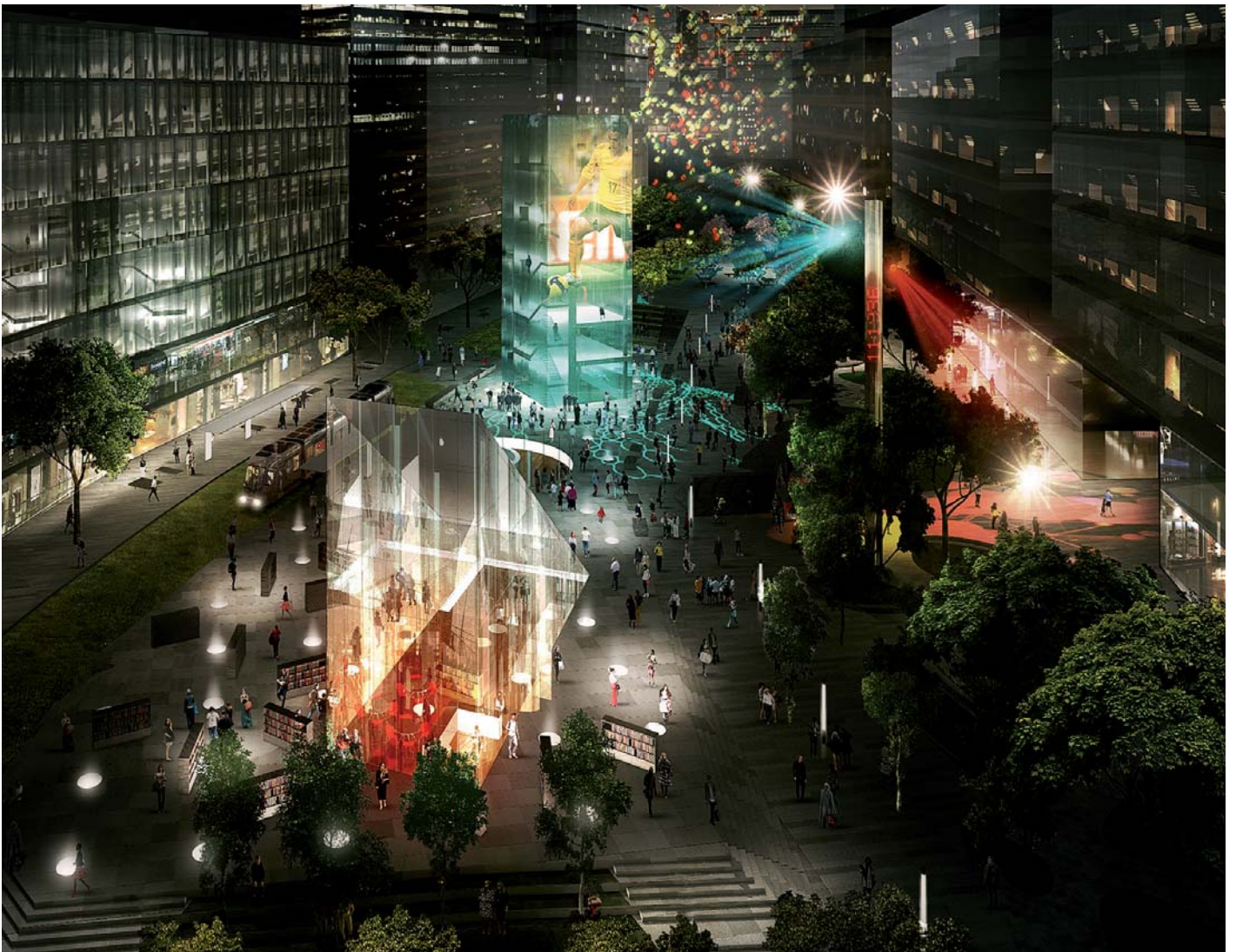
### Approach

Green Centre Town Centre will be the focal point of the Green Square Urban Renewal area.

The Civic Place (Green Square Plaza) will form the heart of the Green Square Town Centre. It will provide a grand civic space offering as the location of the library, communal space for play, learning, and cultural events. Surrounding the civic place is an offer of retail and restaurants.

### Direction

The Green Square Town Centre public domain strategy provides directions to create a distinctive character and memorable place that will be achieved through elements such as iconic built form features, landscape, special street feature and creative lighting applications that could include use of catenary as well as special pole elements.



Green Square photomontage, Stewart Hollenstein, City of Sydney

## Village Main Streets

### Approach

Creative lighting applications may also be limited to a Village Main street context rather than a broader precinct approach. These streets include:

- King Street, Newtown;
- Crown Street, Surry Hills;
- Glebe Point Road, Glebe;
- Redfern Street, Redfern;
- Darlinghurst Road, Kings Cross
- Oxford Street, Darlinghurst
- Harris Street, Pyrmont
- Botany Road

Village Main Street creative lighting applications will further reinforce street hierarchy and contribute to an enhanced retail and night time experience.

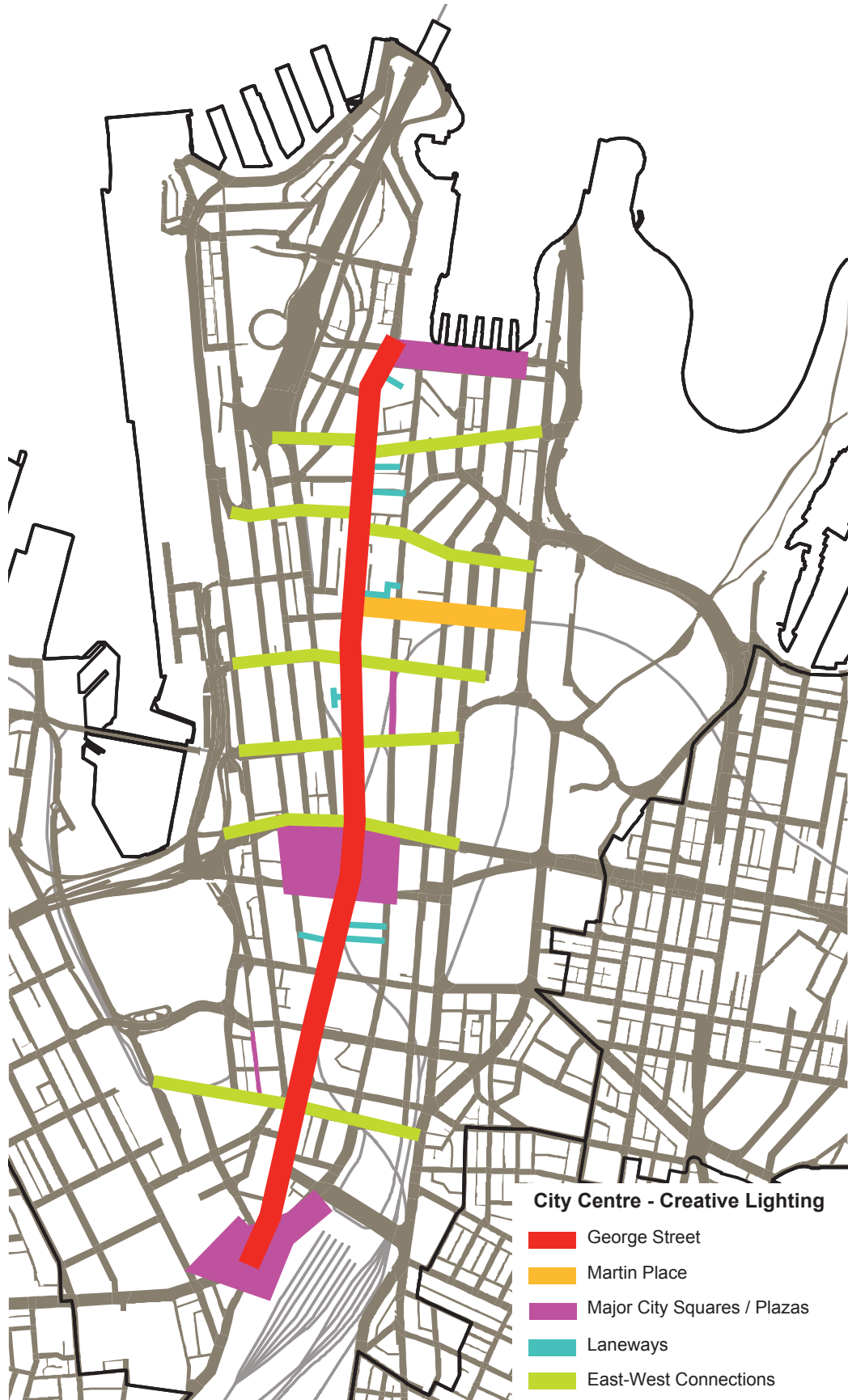
### Strategic Direction

- The functional lighting, in line with the functional lighting palette of this code, is to be supplemented and enhanced with an additional layer of engaging, and pedestrian focussed lighting.
- Lighting is to respond to the unique character of the street.
- Lighting should be appropriate for human scale and human activity, and focus on pedestrian movement through the area.
- The lighting strategies in these areas should utilise lighting treatments such as tree lighting, façade lighting, relevant sculpture/feature lighting and/or integrated furniture lighting.
- To achieve the above directions, special lighting elements and luminaires outside the standard functional lighting palette can be used.



Jubilee Square, Glebe Point Road, Paul Patterson / City of Sydney

#### 4.3.4 City Centre



## George Street

### Approach

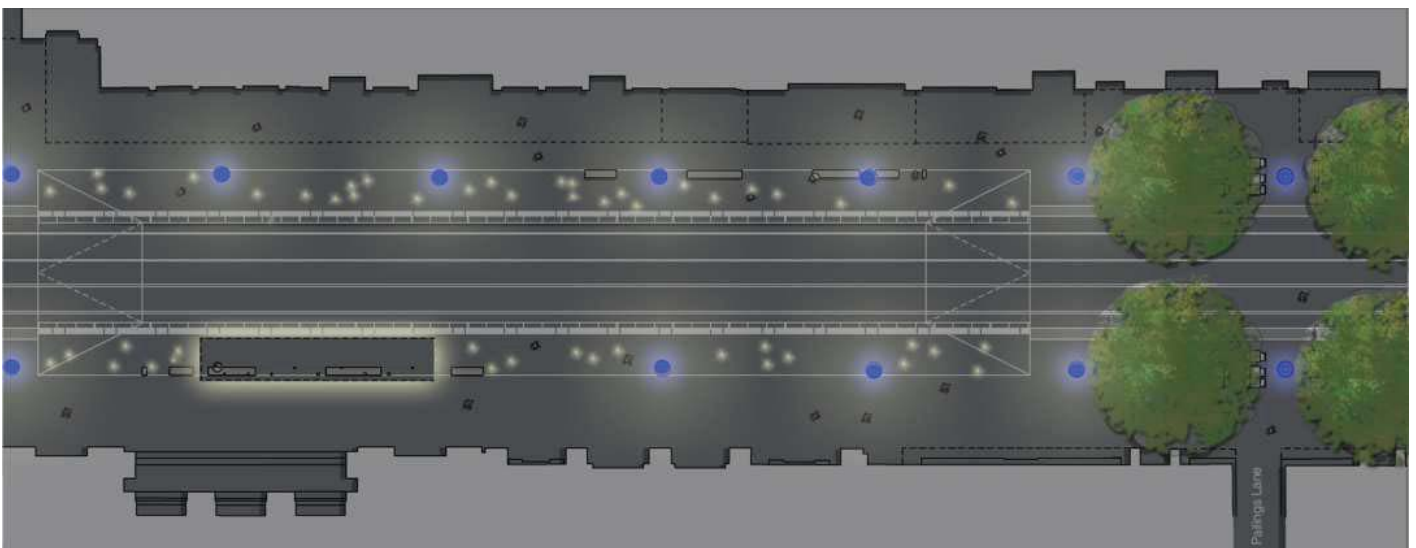
George Street is the City's central spine, with priority for public transport and pedestrians. This central boulevard connects the major city squares and is to provide a unique experience, differing to the other areas within the city centre.

### Direction

A specific lighting strategy and masterplan has been developed in 2013. Key aspects include:

- Consistent lighting techniques along the length of the street, incorporating a custom and unique lighting structure to create a strong and recognisable identity
- Curated architectural lighting/ façade lighting as background for the night- time environment and as a contributor to perceived brightness
- Tree lighting to enhance landscaped elements and the streetscape
- A dynamic lighting layer that follows the movement of the light rail, contributing to safety and creating a dimension of spectacle and engagement

Refer to the George Street Lighting Master Plan 2013 for further information.



George Street Lighting Concept by Stensen Varming for George Street Lighting master plan

## Martin Place

### Approach

Martin Place is a key City Centre Plaza and shared zone for pedestrians and cyclists. The Martin Place Lighting Masterplan is currently being developed to provide lighting principles to inform future lighting renovations and development in the precinct. These principles are to act as benchmark project for future city centre plaza/square lighting masterplans.

### Strategic Direction

In order to create the conditions for unique and specific responses within a harmonious context, the following design strategies have been developed:

- Enhancement of the continuity of the pedestrian zones spanning the length of the precinct
- Conceptualising of the precinct as a collage of 'moments'
- Specification of unique lighting treatments, appropriate to the style and scale, to individual buildings and objects
- Establishment of a luminance hierarchy to promote way-finding and legibility, and avoid visual fatigue
- Use of lighting features such as façade lighting and lighting of monuments and also different light levels to articulate that the character of Martin Place is different from the vehicular cross streets in lighting ambiance.



Martin Place, Paul Patterson / City of Sydney

## City Centre East West Connections

### Approach

**East-West Pedestrian Connections:** Six key city centre east-west connectors have been identified as playing a significant role in the pedestrian experience and wayfinding ability. These include:

- Hay Street
- Park Street- Druitt Street
- Market Street
- King Street
- Hunter Street- Curtin Place- Margaret Street- Wynyard Walk
- Bridge Street- Grosvenor Street- Kent Street Underpass

### Strategic Direction

In order to create the conditions for unique and specific responses within a harmonious context, the following design strategies have been developed:

- Enhancement of the continuity of the pedestrian zones spanning the length of the precinct
- Conceptualising of the precinct as a collage of 'moments'
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- Use of lighting features such as façade lighting and lighting of monuments and also different light levels to articulate that the character of Martin Place is different from the vehicular cross streets in lighting ambiance.

## Laneways

### Approach

The City Centre laneway revitalisation program provides the opportunity for special lighting applications to reinforce legibility of the city and create laneways as a destination.

### Strategic Direction

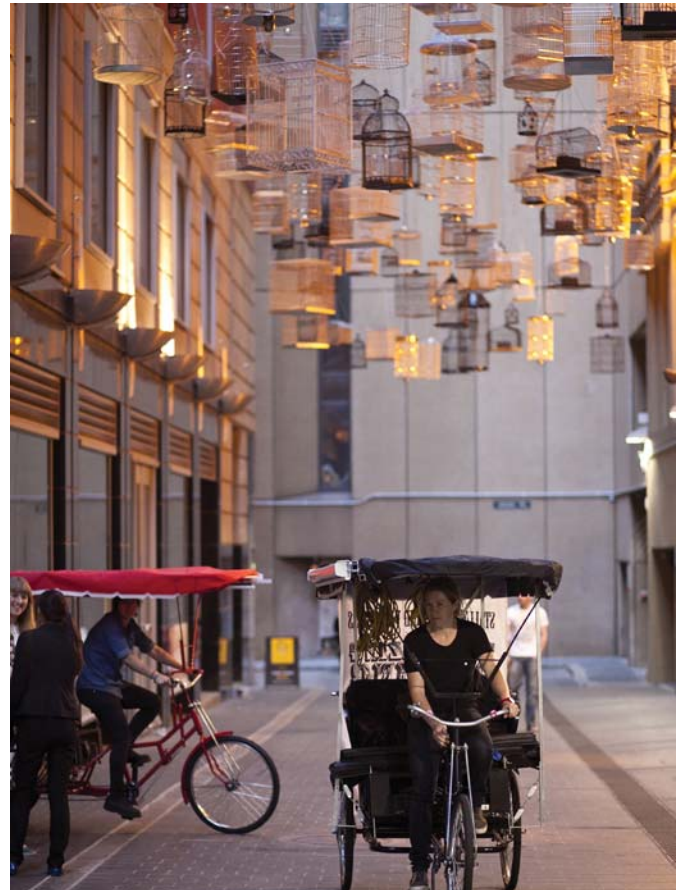
- Lighting is to respond to the unique character, history and features of each laneway.
- The lighting strategy in these areas should utilise light art, catenary lighting, façade lighting and/or integrated furniture lighting to revitalise these underused spaces and create a 'laneway' culture.
- Lighting should be appropriate for human scale and human activity.
- Lighting should engage the public and activate the space.
- Lighting is to provide minimum requirements for both pedestrians and vehicles. If light art is used for functional lighting requirements, the installation is to be approved by a lighting designer to ensure minimum requirements have been met.
- Lighting design may utilise a range of different colour temperatures as long as the base lighting requirements are met. Coloured lighting is to be devised in consultation with the City of Sydney.

Lighting not considered appropriate:

- Street Lighting types
- General floodlight applications
- Festoon type lighting



*Light Breezes*, ARUP, VIVID installation 2012, Cambridge Street, The Rocks, City of Sydney



*Sydney Forgotten Songs*, Michael Thomas Hill, Angel Place, Sydney, City of Sydney



## 4.4 Distinctive Accents

### 4.4.1 Approach

Distinctive Accents are considered as unique elements within the city, which do not qualify as precincts themselves but are integral to the overall legibility of the city and enhance the perception of urban form.

Distinctive Accents work to provide an active lighting environment across the city without disrupting the dominant impact and key identities of the precincts. Distinctive Accents hold their own unique identity and may take on varied roles though such as artistic interventions and landmarks.

The classification and application of Distinctive Accents will be assessed individually on a case by case basis by the City of Sydney and can include the following:

- Civic buildings
- Monuments
- Civil Infrastructure including underpasses and pedestrian tunnels
- Parks
- Plazas
- Tree lighting
- Temporary Events
- Public Art

Distinctive accents can be temporary, permanent or dynamic and can include a variety of lighting techniques such as:

- Strategically selected façade lighting, using colour and media façade techniques where appropriate only;
- Concealed and integrated architectural lighting (e.g. lighting of heritage buildings or features)
- Lighting of public art, or creation of decorative lighting sculptures to enhance streetscapes and laneways;
- Projected images, which are capable of being choreographed to create changing effects;
- Temporary decorative lighting, associated with special events, cultural and civic festivities.

If applied selectively, distinctive accent lighting responsibly addresses energy consumption, sky glow and other environmental impacts.

### Civic Buildings

Lighting applications can call attention to distinctive civic buildings and other landmarks that are worthy of accentuation to help create reference points and aid in way-finding, particularly in areas outside the city centre.

### Strategic Directions

- Buildings with distinctive lighting applications are to be chosen selectively and in consultation with the City of Sydney. Most of the city should appear as a backdrop to a few special buildings and places that have distinctive lighting.
- Timer controls are to be used to limit the duration of distinctive lighting applications. All distinctive lighting is to be non-operable after 2am to reduce energy consumption and excessive light pollution.
- Light sources to light heritage building are to be incandescent in appearance with a colour temperature range of 2500K – 3200K to give a warm glow to historic architecture. Refer to 3.4.2 Heritage Areas for further information. All other light source colour temperatures are to be selected to enhance the architectural quality, colour and texture of the building.

Lighting not considered appropriate:

- Lighting on buildings which can detract from the architectural qualities (e.g. festoon lighting on architecturally expressive façade)
- Broad indiscriminate floodlighting of facades from large light sources located remotely from the building. These significantly impact on glare and sky glow. Floodlighting should be directed to enhance building architecture and detailing.
- Coloured lighting is only to be used in specific circumstances in consultation with the City of Sydney.



Queen Victoria Building, George Street, Paul Patterson / City of Sydney

## Monuments

Lighting of selected public monuments within the City of Sydney can create a sense of prominence and express the history of an area.

## Strategic Directions

- Monuments are to be selected for significant public merit and to establish recognisable night time landmarks.
- Timer controls are to be used to limit the duration of distinctive lighting applications. All distinctive lighting is to be non-operable after 2am to reduce energy consumption and excessive light pollution.
- Light sources are to be of appropriate colour temperature to enhance the natural colour, materiality and texture of the monument. Consult with the City of Sydney for specific requirements.
- The lighting design is to accentuate specific features of interest and is not to floodlight.
- Luminaires should be located so they do not visually interfere with viewing the monument.

Lighting not considered appropriate:

- Broad indiscriminate floodlighting of monuments from large light sources located remotely from the building.
- Coloured lighting is only to be used in specific circumstances in consultation with the City of Sydney.



Glebe War Memorial, Paul Patterson / City of Sydney

## Plazas

City Centre public plazas and squares, act as recognisable meeting places and spaces to sit and relax within the urban context of the City. Plazas provide opportunity for community activities, voicing opinions, sitting areas and meeting areas. They provide a pocket of space allowing reprieve from the busy main city streets. Lighting should therefore reflect a more subtle, integrated approach, with pedestrian focus.

A distinctive and creative approach may be taken for specific plazas in consultation with the City of Sydney

## Strategic Direction

- Plaza lighting should be designed and integrated into the urban fabric and landscape design of the space.
- Lighting should respond to and highlight the uniqueness and character of each plaza.
- Luminaires should be concealed from view wherever possible and the day- time view of the fittings should be considered and minimised.
- Lighting should not be uniform across the site but should utilise shadow and light to create focal points and engage the users.
- Sculptures or public art within the plaza may be highlighted.
- Vertical façade lighting unique and appropriate to the style and scale of individual buildings and objects. In some instances façade lighting to contribute to pedestrian pathway lighting, if controlled and maintained by CoS.
- Street level lighting to be relative to façade brightness rather than uniform throughout.
- Tree lighting to enhance landscaped elements amongst the paved experience
- Lighting to provide a series of pedestrian 'moments' throughout the site.

Lighting not considered appropriate:

- Flood-lit spaces with uniform brightness across the entire park
- Use of solely pole lighting applications.
- Lighting that focusses on ground illumination only



## Parks

Parks that have a unique character or are a night time destination have potential to include a creative lighting overlay. Parks provide an important social function within the City both during the day and in enhancing the night time economy. These areas require an individual lighting strategy that is to be developed to align with the parameters set out for general parks.

## Strategic Direction

- Meet the basic lighting requirements as defined in the functional lighting palette for a general park. The lighting types used to achieve these levels are open to the designer in conjunction with CoS. Luminaires must comply with the technical requirements outlined in Section Two.
- **Heritage parks need to be considered taking into account existing heritage elements and in line with relevant heritage conservation plans and plans of management.**
- A creative lighting overlay is encouraged through use of tree lighting, catenary lighting or furniture lighting.
- The design of up-light for trees and landscaping should consider existing site conditions to ensure limited impact on tree root zones.
- Provision should be made to implement a holistic lighting strategy for both general use and 'event' use. This may be the case for a park used for monthly markets. The 'creative' lighting overlay may be turned on for a specific period each month.
- The lighting scheme for all parks should consider lighting of the following elements; Main park entries, park perimeter, main pedestrian and cycle through pathways and surrounding areas, selected landscaped areas i.e. trees, furniture or public art/architectural elements.
- The lighting strategy should utilise both shadow and light to distinguish the park from the general streetscape and to provide direction and focus at night-time.

Lighting not considered appropriate

- Flood-lit spaces with uniform brightness across the entire park
- Lighting limited to the main pathways only, with dark trees or bushes surrounding the pathway, without extending the light into the surrounding areas.
- Fairy / Festoon type lighting



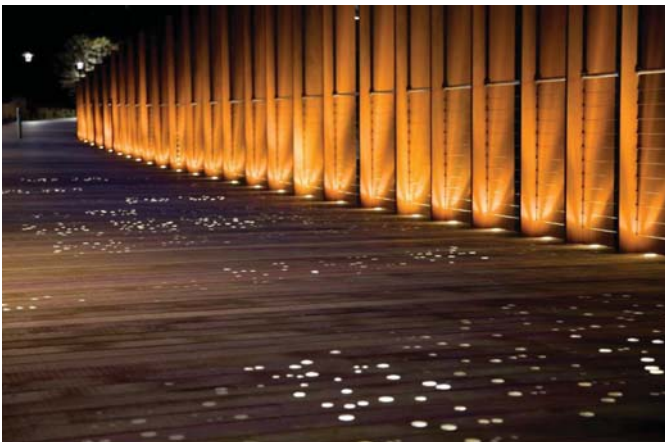
*The Highline* New York, google web search, photographer unknown



*The Highline* New York, google web search, photographer unknown

## Civil Infrastructure- Underpasses and Pedestrian Tunnels

Within the City of Sydney there is an opportunity for the mundane and often non-attractive civil infrastructure, such as road viaducts, underpasses and pedestrian tunnels, to be subject to distinctive lighting interventions to create unexpected delight not evident during the day without impacting on the strength and identity of the distinctive precinct lighting schemes.



University of Sydney Public Domain, Lighting Design Steensen Varming, Cavanagh Photography

## Strategic Directions

- General lighting to utilise wall mount, catenary, furniture and light art lighting typologies rather than pole mounted luminaires.
- Light Art installations must meet functional lighting requirements as outlined in the Standard Lighting Palette.
- Lighting should be create a feeling of safety and enhance the night time pedestrian experience.
- Minimum lighting requirements are to be sustained from dusk until dawn. If distinctive lighting is used in conjunction with general lighting, then timer controls are to be used to limit the duration of distinctive lighting elements. All distinctive lighting is to be non-operable after 2am to reduce energy consumption and excessive light pollution.
- Lighting elements should provide guidance to pedestrian users.
- General lighting is to be provided for vehicular use if required.
- Consideration of transition and visual adaptation between daytime environment and underpass/ tunnel lighting is required. Surface brightness is encouraged.

Lighting not considered appropriate:

- Strobe or flickering lighting
- Glare sources or visible luminous surfaces



Warren Langley, *Aspire*, 2009, Harris Street, Ultimo

## Tree Lighting

Tree lighting is to be utilised in particular parks and along priority pedestrian routes to enhance pedestrian amenity, the perception of safety and overall feel of brightness. Tree lighting can facilitate and contribute to way finding and important vistas, and where appropriate, can add a more dramatic effect or background.

### Strategic Direction

- Use of white light, with a colour temperature suitable to the tree type.
  - Luminaires are generally to be located on adjacent poles or in ground. In ground lighting should be directed towards the tree trunk and underside of the canopy to minimise upward spill light.
  - Consultation with arborist where lighting positioning affects tree roots or branches.
  - Lighting to deciduous trees must be controlled via a seasonal timer to turn lights off when the tree is bare.
  - Tree lighting is not to contribute to overall lighting levels. Surrounding lighting must comply with relevant standards when tree lighting is turned off.
- Control timers to turn off late at night for energy efficiency, adjust to any seasonal variation of foliage and avoid disruption to fauna;

Lighting not considered appropriate:

- Coloured lighting (unless specifically agreed with the City of Sydney or provided for a temporary event only)
- Fairy / Festoon type lighting



Glebe Foreshore, Paul Patterson / City of Sydney

## Public Art

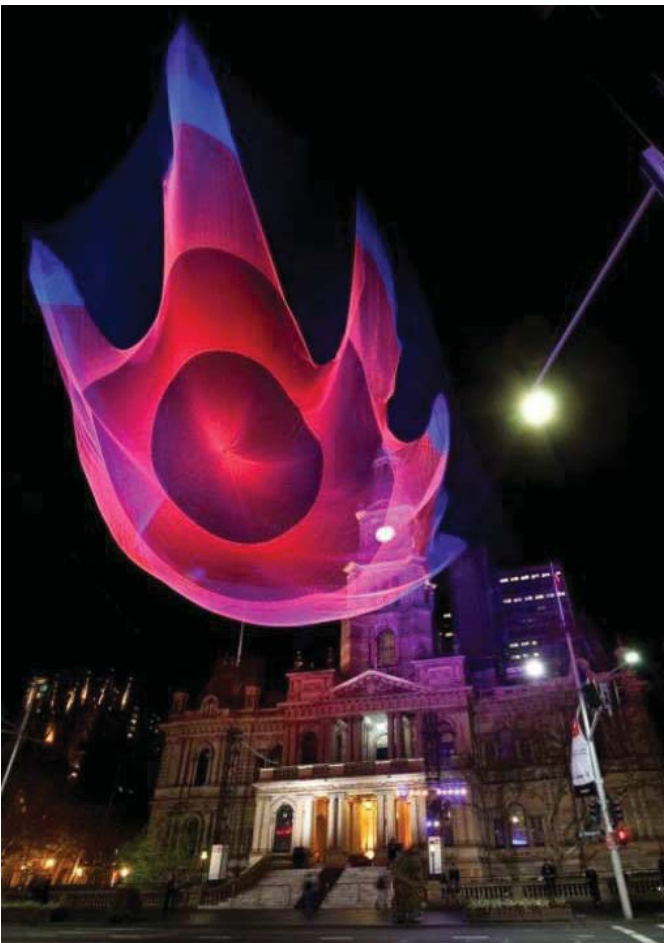
Public Art provides distinctive elements within the city. In some instances these are accentuated by lighting and in other instances, they are lighting elements in their own right. The City's Public Art Strategy, 2011 and the following Green Square Public Art Strategy 2012, provide further strategic directions for both temporary and permanent public art installations.

## Strategic Direction

- Light art is to be used in specific areas as designated by the CoS to activate a space such as a laneway and create a unique atmosphere.
- Where possible light art should provide sufficient lighting to comply with the recommended AS1158 lighting levels as designated in the above character areas and pallets. This should be confirmed by a lighting designer. If compliance is not achieved other lighting elements must be considered as part of the overall lighting scheme.
- Light art will be reviewed on a case by case basis for specific locations in line with the specific intent of the artist
- Minimisation of glare and glare sources are paramount; lighting is not to distract but enhance the artwork.
- Mounting of luminaires is not to affect viewing of the artwork during the day time or the night time.
- Collaboration and dialogue with the artist is encouraged to ensure the lighting design is appropriate to the artwork and artist's intent
- Light art to comply with OH&S issues of public safety

Lighting not considered appropriate:

- General floodlighting without focus
- Artwork mounted luminaires, unless luminaires form part of or form the artwork
- Strobing or flashing light art



Janet Echelman, *Tsunami 1.26*, 2011, Town Hall, Sydney

## Temporary Events

Permanent lighting installations can be complemented by temporary lighting events. Temporary lighting events can create theatrical displays for cultural and civic festivities such as Art and About and Sydney Vivid Festival.

## Strategic Direction

- Lighting is to be designed specifically for an event and to be temporary in nature
- OH&S and safety requirements are to be considered and included in the design, despite the temporary nature of the installation
- Integrated into lighting structures where practical to do so
- Consideration and planning of power cable runs and access points is required
- Use of permanent infrastructure (for mounting etc) is encouraged, but is to be coordinated with the City of Sydney.

Lighting not considered appropriate:

- Lasers



Richard Goodwin, Russell Lowe, Adrian McGregor, *Seven Metre Bar*, 2009, Underwood Street, Sydney, Jamie Williams / City of Sydney



## 4.5 Special Lighting Elements

This section outlines basic outlines technical parameters for use of special lighting elements, providing benchmarked examples and project references.

### 4.5.1 Non Standard Poles and Fixtures

Use of special non-standard poles and lighting fixtures to provide functional lighting provision may be appropriate in certain contexts to reinforce sense of place or character.

The use of these special non-standard elements is subject to approval by the City of Sydney. Unless a specific project warrants a custom designed luminaire element, the general preference and direction is the use of an existing and available product with local support, to reduce maintenance costs and streamline City lighting assets management procedures. Both instances offer the opportunity for a custom designed pole or lighting structure.

The luminaire in both instances outlined above must comply with the requirements below:

- Luminaire should shield light source to prevent upward spill light and direct all light downwards. If otherwise, consult with the City of Sydney.
- Light source to be LED 3000K/4000K, min 65 lumens/watt with lamp LED life min 80% at 50,000H
- Light distribution to be rotationally symmetrical, asymmetric forward throwing or longitudinal (side throwing), dependant on site location and lighting requirements. Above 0° horizontal, the light output ratio is to be  $\leq 3\%$  of lamp lumens.
- Luminaire to have min IP65 rating and min IK04 rating
- For mounting detail information refer to the City of Sydney Streets Code 2013

### 4.5.2 Catenary Lighting

Catenary lighting is a high tension suspended cable lighting system that is to be used in plazas, laneways, underpasses, pedestrian tunnels and pedestrian priority areas in order to differentiate the space from the surrounding environment and create a more intimate and informal atmosphere. This lighting application is generally not supported by CoS, but may be approved in certain circumstances.

- Light source to be LED, min 65 lumens/watt with lamp LED life min 80% at 50,000H. LED CCT may be selected for sight specific applications. Consult with the City of Sydney for approval.
- Light Distribution is to be asymmetric or symmetric. Above 0° horizontal, the light output ratio is to be  $\leq 10\%$  of lamp lumens (TBC).
- Catenary luminaire to have min IP65 rating, and min IK04 rating
- Mounting to be concealed and respective of building fabric. Refer to Streets Code.



Prince Alfred Park, Paul Patterson / City of Sydney



Pitt Street Mall, Paul Patterson / City of Sydney

### 4.5.3 Bollards

Bollard lighting is generally not supported by the City for use in the public domain. In some cases a bollard may be considered, where a particular effect is required or where views and certain proportions need to be maintained. The use is subject to City of Sydney approval.

### 4.5.4 Furniture Lighting

Integrated lighting in furniture is to be used in parks, plazas, pedestrian priority areas and village centre and activity strips. Integrated furniture lighting provides an informal, playful lighting element within a community area.

- Lighting integration is to be seamless
- Light source to be LED, min 65 lumens/watt with lamp life min 80% at 50,000H. LED CCT may be selected for site specific application. Consult with the City of Sydney for approval.
- Light distribution to be appropriate for context and installation so as to not cause glare or upward spill light.
- Luminaires to have min IP65 rating and min IK04 rating.



Jubilee Square, Glebe Point Road, City of Sydney

## 4.6 Creative Lighting – Implementation

### Priority Implementation Plan

It is recommended that a stage approach to implementation be undertaken. Staging and timing will involve identifying project priorities based on:

- Available resources allocated in the City's capital works program.
- Strategic opportunities to link with other existing public domain projects and programs such as George Street light rail. In general it will be more cost effective to implement lighting masterplans in conjunction with other projects to achieve efficiencies by co-ordinating with other civil works.
- Contribution a creative lighting application can make to achieve City's strategic objectives in Open Sydney, Retail Action Plan, and Tourism Action Plan.
- Private sector interest to contribute and partner with the City to deliver a creative lighting application.
- Capacity to maintain the system to a high level quality over time.

### Creative Lighting Masterplans

For each identified precinct the preparation of a creative lighting masterplan that fully scopes the opportunities and proposed lighting scheme is vital to ensure co-ordination with broader public domain proposals for an area.

A masterplan will also allow the private sector to progress the development of a lighting scheme for their buildings in a consistent and co-ordinated manner.

Ideally the lighting masterplan should be considered as part of an overall Public Domain Plan for a precinct / place.

The lighting masterplan should include:

- Specific creative lighting masterplan objectives
- Co-ordination with required functional lighting requirements and public domain proposals
- Guidelines for recommended colour temperature, and approach and directions for fixtures on buildings and public domain
- Implementation strategy
- Energy efficiency considerations

Creative Lighting Masterplans will form the basis for developing detailed lighting designs and specifications to allow scheme implementation.

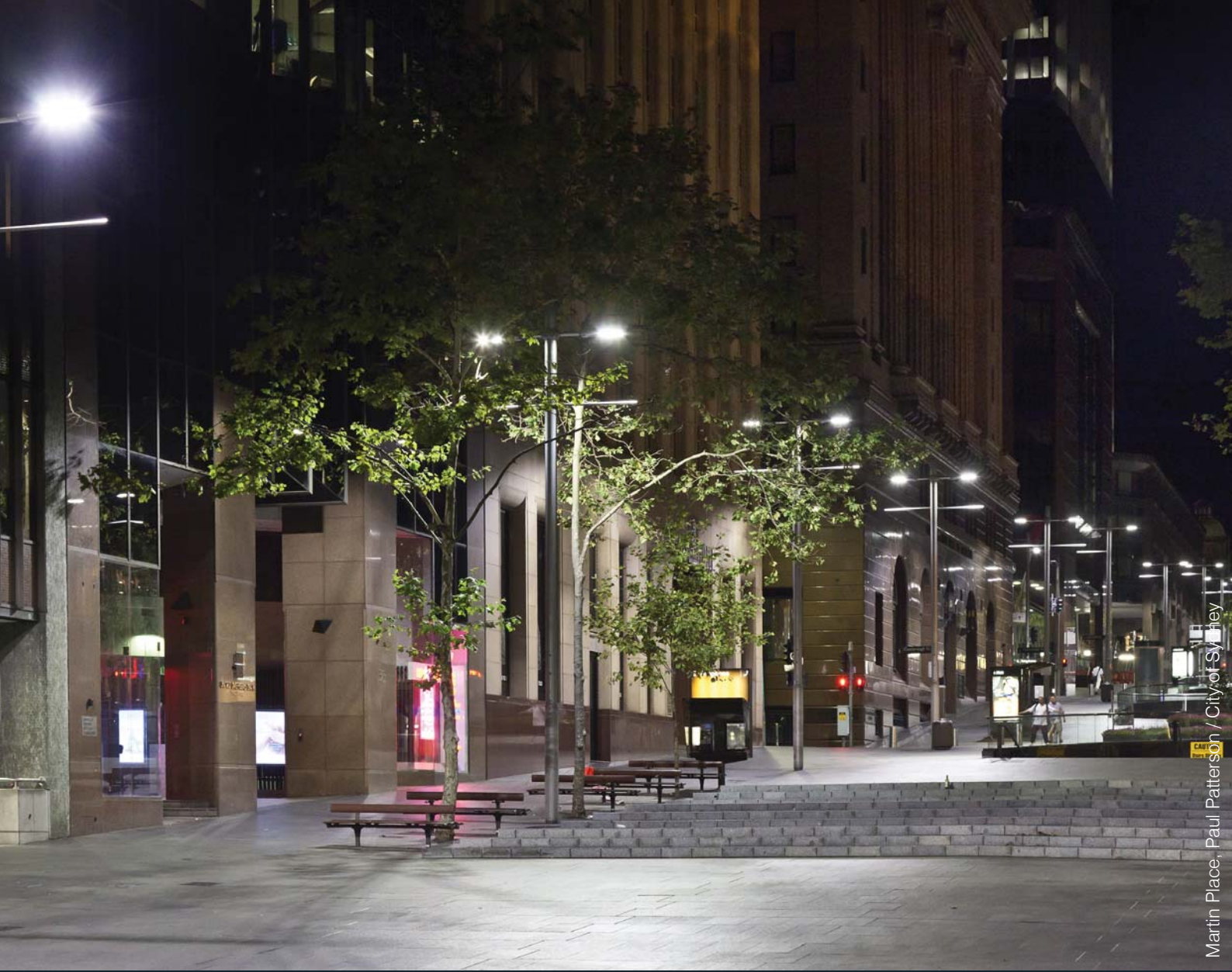


Wynyard Park

# Sydney Lights Part Five

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## Maintenance and Asset Management



Martin Place, Paul Patterson / City of Sydney

## 5.0 Maintenance and Asset Management Procedures

### 5.1 Asset Management

The City's Asset Management Policy is to ensure that the City has information knowledge and understanding about the long-term and the cumulative consequences of being the custodian of public infrastructure.

Public lighting asset management is based on the following principles to guide sustainable management of infrastructure assets. They are:

- Take a lifecycle approach – apply a whole of life methodology for managing infrastructure assets including planning, acquisition, operation, maintenance, renewal and disposal
- A manageable portfolio of lighting technologies to minimise lighting maintenance response times
- Sustainable environmental performance
- Best value – balance financial, environmental and social aspects to achieve best value
- Decision support systems and knowledge such as GIS mapping of lighting assets– core systems will include up to date infrastructure asset information to inform decisions
- Service levels – infrastructure asset service levels will be clearly defined
- Long-term financial plans – asset practices, plans and systems will enable the development of long term financial plans for asset classes
- Manage risks associated with infrastructure assets; and
- Continuous improvement of asset management practices

### 5.2 Maintenance

Properly maintained equipment is an essential prerequisite of all approved lighting installations. It not only is important from a civic appearance aspect but in many cases from public safety and security aspects.

All installations will decrease in effectiveness over time due to aging lamps and the soiling of the exterior of luminaires and reflectors. Aiming suffers due to factors such as vibration and poor adjustment after lamp replacement. These characteristics not only spoil the designed appearance but also waste energy.

The proposed practice for the maintenance of public lighting is to carry out a bulk replacement of lamps at the end of the effective lamp lifetime, taking into account the economic and operational characteristics of the lamps. Alternatively the preference is to replace defective lamps upon notification of faults.

It is recommended to initiate a new maintenance regime for City owned lights. To control total lighting maintenance costs, the City will adopt a preventive and predictive maintenance regime for all City owned lights. The City will conduct or contract to have conducted a regular inspection, cleaning and maintenance (including bulk lamp replacement as appropriate) of all decorative lights.

The inspection, cleaning and maintenance cycle should be driven primarily by the bulk lamp replacement and cleaning requirements for the installations (24 or 36 months depending on lamp technology and location). The tasks should include the following:

1. Verification of existing inventory data and corrections as needed
2. External visual condition assessment of luminaire and pole/bracket
  - Missing, damaged or defective components
  - Tree or other interference
  - Verify night-time operation
3. Replace any readily replaceable defective or broken components
4. Determine if current/imminent major repair or replacement is required and record
5. Cleaning of luminaire lens and reflectors and, bulk lamp replacement
6. Coat visible corrosion with rust protection and touch-up paint as required
7. Re-coat base of pole with rust protection or paint as appropriate
8. Return recovered components for recycle or appropriate disposal. Failed lamps should be sent to an appropriate recycling facility

The City may also pursue night patrols 3-4 times per year in areas where there are no natural reporting parties

(eg park safe city staff or security personnel). Lamp replacements could then be conducted in bulk following a patrol.

In addition, development applications that cover the illumination of the public domain must include maintenance plans for approval.

In regard to lamp/ light source maintenance it is recommended that bulk lamp replacement be carried out within sections of the precinct according to the lamp type. Most luminaires will use LED sources: LED's generally have a service life in excess of 50,000 hours at which point the luminous flux drops below 70% of its original output. The LEDs will then slowly continue to degrade and need replacement.

It is recommended that a luminaire maintenance and lamp replacement schedule be incorporated within documentation provided by the lighting designer for each specific project.

Education of staff plays an important part in a well maintained lighting installation. Not only to fully understand the technical aspects but to also be informed of the lighting design principles and objectives.

### **5.3 Waste Management Plan and Recycling**

Public lighting produces a number of waste and recyclable streams.

Waste management planning involves recycling of as many materials and components as possible and responsible disposal of the balance.

Systematic maintenance using bulk replacement of lamps at end of design life rather than failure allows for better and more effective management of lamp waste and maintenance of luminaire performance.



# Sydney Lights Part Six

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## Appendices



## 6.0 Appendices

### 6.1 Appendix 1: Glossary

<b>Accent</b>	Where light is used to emphasise or highlight objects.
<b>Candela (CD)</b>	Unit of luminous intensity equal to one candle power.
<b>Colour rendering</b>	The effect of a light source on the colour appearance of an object.
<b>Correlated colour temperature</b>	The absolute temperature of a black body radiator whose chromaticity most nearly resembles that of the light source being considered. Unit: Kelvin.
<b>Efficacy</b>	A factor which quantifies the effectiveness of a luminaire in converting electrical power to light.
<b>Glare</b>	The discomfort or impairment of vision experienced when parts of the field of view are excessively bright.
<b>Illuminance</b>	The luminous flux arriving at a surface divided by the area of the illuminated surface. Unit: lux
<b>Lamp</b>	Complete light source unit.
<b>Light</b>	Electromagnetic radiation with a wavelength between 380nm to 720nm.
<b>Luminaire</b>	Complete lighting units consisting of lamp, control gear (if required), reflector and housing.
<b>Lumen</b>	Unit of luminous flux used to describe a quantity of light emitted by a source or received by a surface. Unit: lumens
<b>Luminance</b>	The physical quantity corresponding to the brightness of a surface in a specified direction. Unit: cd/m <sup>2</sup>
<b>Sky Glow</b>	Sky glow is the brightening of the night sky that results from the reflection of radiation (visible and non-visible), scattered from the constituents of the atmosphere (gaseous, molecules, aerosols, land particulate matter), in the direction of observation. It comprises two separate components. Natural sky glow – that part of the sky glow which is attributable to radiation from celestial sources and luminescent processes in the Earth's upper atmosphere. Artificial sky glow – that part of the sky glow which is attributable to manmade sources of radiation (e.g. outdoor electric lighting), including radiation that is emitted directly upwards and radiation that is reflected from the surface of the Earth.
<b>Traffic deterred</b>	As defined under AS/NZS 1158.3.1:2005 Clause 3.2.6.3. "When the purpose of the road is such that the intention of traffic management devices is generally to slow and deter traffic other than vehicles with their origin or destination in that road, the devices shall be identified to drivers using one of two technologies as follows:" (a) Using reflectors (Refer to standard for details) (b) Using roadlighting luminaires including roundabouts and the intended effect of a traffic management device on a vehicle passing through it is to cause the driver to reduce speed and maintain a reduced speed while travelling through the device. (Refer to standard for further details.)
<b>Traffic slowed</b>	As defined under AS/NZS 1158.3.1:2005 Clause 3.2.6.2. "Where the purpose of the road is such that the intention of traffic management devices is generally to slow traffic and regulate its flow at conflict points but not to deter or reduce the volume of through traffic, the intended effect of a traffic management device on a vehicle passing through it is to cause the driver to reduce speed and maintain a reduced speed while travelling through the device." Refer to standard for further details.
<b>Watt</b>	Unit of electrical power

## 6.2 Appendix 2: Background- City of Sydney Initiatives

The Sydney Lights Design Code fits under a broader policy and strategic planning directions prepared by City of Sydney. This includes the following:

### 6.2.1 Sustainable Sydney 2030

Sustainable 2030 Targets that public domain lighting can contribute to include:

#### Target 1

By 2030, the City will reduce greenhouse gas emissions by 50 per cent compared to the 1990 levels, and by 70 per cent compared to 1990 levels by 2050  
'A 10 per cent overall reduction in emissions is possible by phasing out incandescent light bulbs with progressively more efficient lighting technologies.'

#### Direction 4

A City for pedestrians and cyclists  
**Objective:** 'Develop a network of safe, linked pedestrian and cycle paths integrated with green spaces throughout both the City and Inner Sydney.'

#### Direction 5

A lively, engaging City Centre  
**Objective:** 'Strengthen the City's public domain, identify and create more places for meeting, rest and leisure.'  
**Objective:** 'Support the development of diverse, new bars and restaurants in the City Centre'

#### Direction 9

Sustainable development renewal and design  
**Objective:** 'Define and improve the City's streets, squares, parks and open space, and enhance their role for pedestrians and in public life.'

### 6.2.2 City Public Domain Plans

The City Centre has been divided into precincts for which detailed feasibility and public domain plans will be developed. To date Plans have been prepared for Chinatown, Harbour Village North and George Street. These Plans analyse and recommend the scope, location and extent of public domain improvements including lighting over the short, medium and long term. Recommendations for creative lighting overlays will be further scoped and developed by individual Lighting Masterplans for each precinct.

### 6.2.3 Open Sydney

Open Sydney provides a vision for the night time economy of the City of Sydney and is a guiding factor in the development of the lighting master plan. Lighting activates the night and is crucial in allowing and supporting night time activities.

The night time vision is based on five goals all of which relate to lighting.

A Global Sydney where Sydney is an internationally recognised night-time city, based on our design, diversity, safety, innovation, creativity, strong economic growth and leadership; where we govern our city well through coordinated action.

A Connected Sydney where businesses connect to events, to each other and to residents, workers and visitors; with hubs that activate different city precincts; where transport links to outer suburbs; where digital access is fast and free.

A Diverse Sydney with later opening hours, and where more no-alcohol activities attract families and older people; where new venues and activities emerge in underused spaces, and where traditional spaces by day take on new uses at night.

An Inviting and Safe Sydney with beautiful design, including lighting, where spaces for pedestrians encourage strolling and exploring; where streets are safe and free of violence, and where there is respect between visitors and residents.

A Responsive Sydney where innovation is encouraged by reducing red tape, and where proactive, problem-solving teamwork with government and industry is the norm, and local solutions reflect local character

#### **6.2.4 Liveable Green Network**

The Liveable Green Network is a key project idea in Sustainable Sydney 2030 to deliver a pedestrian and cycling network that connects people to the City Centre, Village Centres and neighbourhoods, as well as to public transport, education and cultural precincts and major parks and recreation facilities.

The Liveable Green Network Strategy and Masterplan report 2010 found that to encourage use of pedestrian network will depend on improvements to infrastructure such as footpaths and crossings, wayfinding information and improved public lighting to encourage pedestrian activity at night.

The Liveable Green Network Masterplan provides the means to identify key pedestrian links and destinations across the LGA that may require a review to ascertain if additional lighting provision should be provided.

#### **6.2.5 Safe City**

Safe City is a multi-faceted program to address the safety and security issues of people who live work and visit the City.

The City's Safe City Strategy stresses the importance of adequate lighting levels as a key crime prevention measure, contributing to the reduction in crime and the increase in the public's perception of safety. Part of the Safe City program is the undertaking of safety audits in collaboration with police Local Area Commands to identify safety issues and develop rectification plans that may include a review and update of public lighting provision.

#### **6.2.6 Public Art Masterplans**

In May 2011, Council endorsed a new Public Art Policy and a new City Art Public Art Strategy as a key action of Sustainable Sydney 2030 in line with its key directions to create a "lively and engaging city" and "a cultural and creative City".

Part of the Strategy directions is the preparation of Public Art Masterplans that will guide the creation of high quality public art projects, including projects by the City of Sydney, projects created in partnership with cultural organisations and other projects created by the private sector.

To date public art masterplans have been developed for the City Centre, Green Square, and Chinatown.

In collaboration with the City's public art curatorial advisors lighting could be a key component of a public art proposal that contributes to the distinctiveness of a location.

### **6.3 Appendix 3: International Benchmarking and Positioning Study**

A benchmarking study of a number of recently completed master plans from different countries and of different scales assisted in the positioning of this masterplan within other cities and similar projects, and indicates the following key principles as best practice design.

#### **Sustainability**

A key goal of recent lighting masterplans is to achieve a target of specific sustainable objectives, focussing on a reduction of CO2 emissions, a decrease of energy use, energy costs and minimisation of light pollution. Advancements in technology, including LED colour quality and consistency, efficiency, optics and accessibility provides a viable alternative for City lighting in future upgrades.

The role of lighting in a sustainable city development need to embrace wider aspects of 'urban life', 'identity', 'ideas', 'aesthetics', 'function' and 'technology'.

#### **Safety and wayfinding**

A sense of safety for people at night is a vital and needs to be recognised by the lighting masterplan. Most lighting strategies for public spaces emphasise way finding to main streets and key destinations, to encourage greater public use and feeling of safety.

To guide movement and assist in wayfinding, light can be used for defining and outlining edges and site boundaries, as marker or beacon and with increased focus on pedestrian scale and traffic. Visual links can be created and areas of darkness removed by indicating pedestrian underpasses and passages through lighting.

#### **Identity**

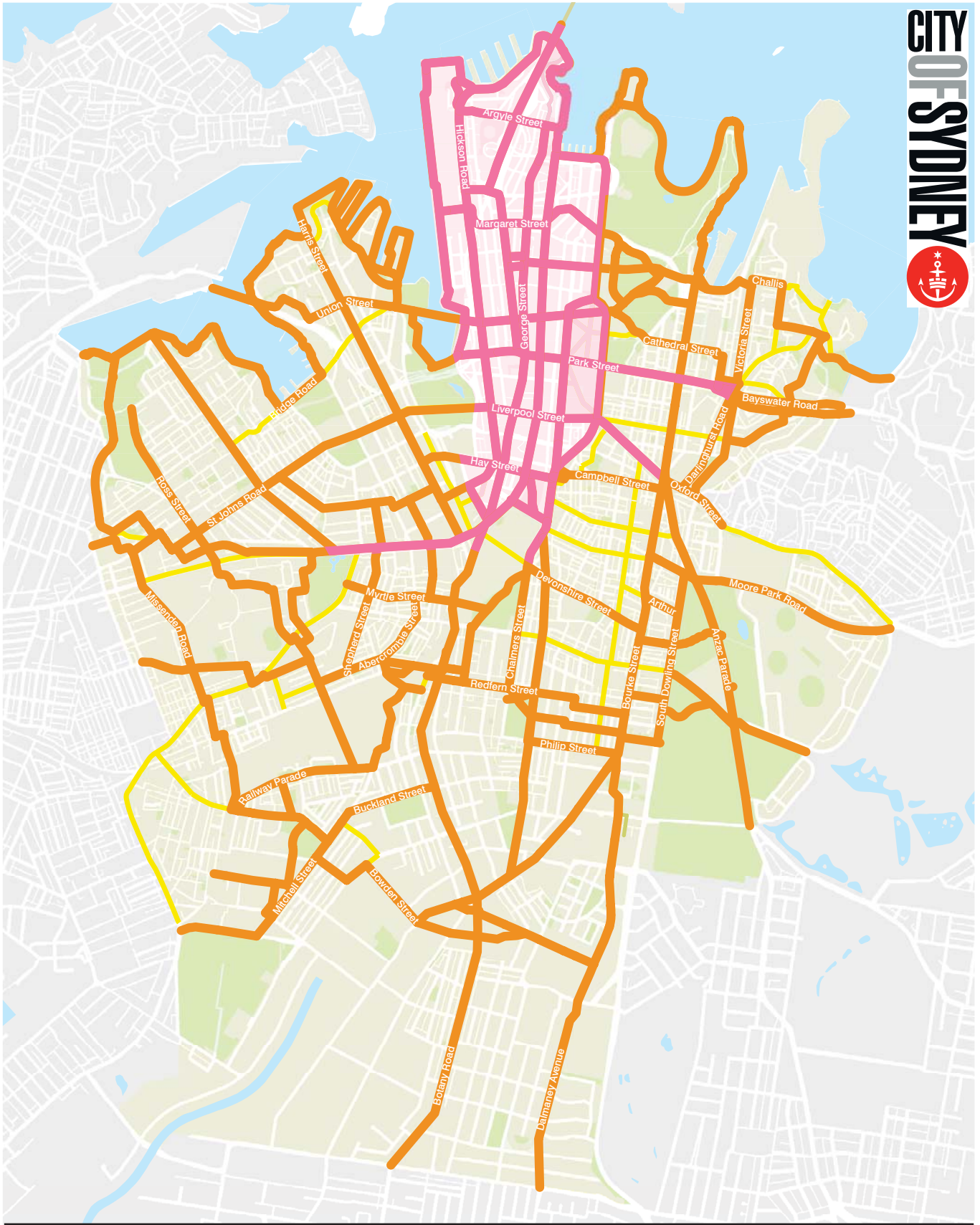
As an intrinsic part of a city's day and night-scape, lighting is used to shape life, place and identity in a city.

Used in the right way, lighting can facilitate a unique identity and recognisable night time environment by providing a clear and structured nightscape, emphasising landmarks, defining spatial boundaries and increasing the legibility of the urban night scape.

Whilst a coherent solution will enhance the overall city identity, recent masterplanning recognises and embraces the diversity and local character of individual precincts and allows for natural and individual developments to enhance specific precinct identities.

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6.4 Appendix 4: Pedestrian Lighting Improvement Plan



	PHASE 1: LGN Priority Network (Pedestrian + Cycle)		City Centre and Gateways note - outside of scope but included in CBD granite infill program
	PHASE 2: Citywide Pedestrian Priority Network		

Liveable Green Network - Pedestrian Lighting Improvement Plan





