TRANSFORMING OUR CITY

City Centre Masterplan

Aberdeen in Colour

City Centre Creative Lighting Strategy

CONTENTS

1 INTRODUCTION

This Creative Lighting Strategy has been developed for Aberdeen's city centre in line with the City Centre Masterplan, to bring a strategic approach to lighting that will help to promote character and identity of the city at night.

Lighting can improve aesthetics and the night time experience of streetscapes and public spaces, and provide a sense of comfort and safety. Defining the city centre as an inviting and vibrant place, lighting can serve as a vehicle for increased night time patronage and tourism.

1.1 Purpose

The Aberdeen City Centre Creative Lighting Strategy - Aberdeen in Colour has been developed in response to the City Centre Masterplan (CCMP) vision to create a **City Centre for a Global City.**

The CCMP establishes that currently, the character and identity of the city centre is lost as daylight fades. It identifies an opportunity for a more strategic approach to lighting in the city centre, for supporting wayfinding and encouraging participation, for enhancing historic and distinct buildings and spaces and for delivering associated benefits for the evening economy through creative lighting. The CCMP defines Project EN11, Aberdeen in Colour, as:

"A comprehensive lighting masterplan that identifies lighting proposals to enhance night time safety and improve the vibrancy and attractiveness of the city centre environment at all times of day. Lighting solutions will need to consider energy conservation and reduce light pollution. The opportunity must be taken to achieve emissions reductions through the specification of energy efficient lighting, and introduce intelligent controls to minimize unnecessary lighting and consequential energy inefficiencies."

1.2 Scope

This creative lighting strategy focuses on, the city centre as shown on Map 1.

Map 1 - City Centre

1.3 Methodology

The approach adopted consists of the six steps listed below. Steps one to four have informed the creative lighting strategy and the implementation, from which the approaches emerge in steps five and six.

Step 1 - Application of CCMP recommendations
To translate the masterplan observations and objectives into lighting design objectives.

Step 2 - Site investigation
To assess the current Aberdeen night-scape, identify opportunities for improvement and issues to be addressed.

Step 3 - Precedent Study
To inform and inspire; to identify best practice, the application of new technologies and innovative solutions.

Step 4 - Stakeholder and public engagement
To understand and identify relevant priorities and preferences of stakeholders and the public.

Step 5 - Development of Creative Lighting Strategy
To provide consistent lighting project guidelines for the evolving and transforming city centre; and to identify catalyst projects to drive the continuous transformation of the city.

Step 6 - Development of Implementation Strategy
To outline the priority, programme and cost for each project.

Through the above steps 1 to 4, a range of opportunities for Aberdeen's night-scape has been identified which informed the creative lighting and implementation strategies (steps 5 and 6).

1.4 Reading the Strategy

The strategy is intended for the reference of Aberdeen City Council, designers, planners, developers, business owners and other stakeholders. For all lighting related works within the city centre the structure is:

Section 1 - 'Introduction' provides an overview of the strategy and how it is set out.

Section 2 - 'Opportunities' identifies the possibilities and potential for a more vibrant night time environment.

Section 3 - 'Creative Lighting Strategy' sets out the framework of the strategy, the vision and the guiding objectives. It includes lighting guidelines for typologies and catalyst projects and how they should be applied through projects.

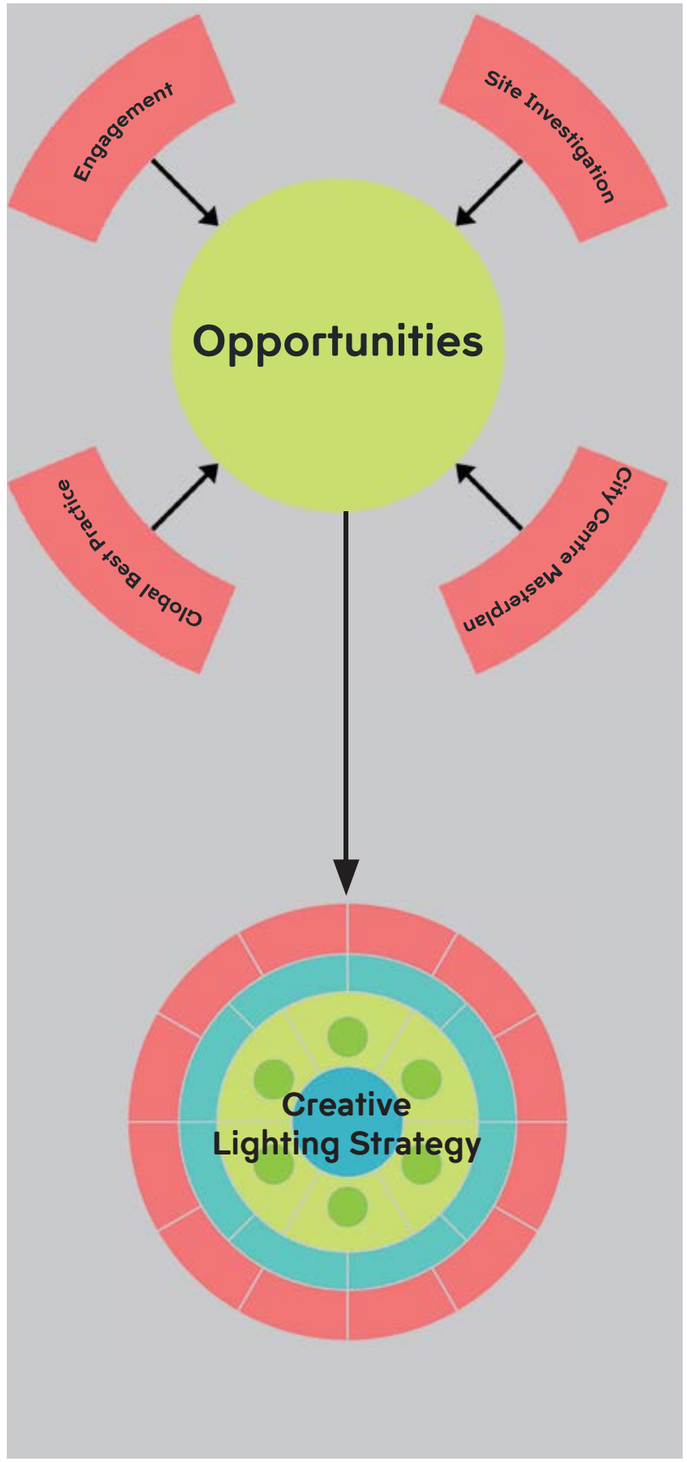
Section 4 - Implementation Strategy provides priority programme and cost for the 12 catalyst projects.

1.5 Context

The strategy is one of a number of documents to guide exterior lighting proposals in Aberdeen City Centre. In addition to the Aberdeen Local Development Plan 2017, the following are applicable to the city centre public domain and should be read in conjunction with this document:

- Aberdeen City Centre Masterplan and Delivery Programme
- Conservation Area Character Appraisals and Management Plan - Strategic Overview and Management Plan
- Conservation Area Character Appraisal - Appendices
- Conservation Areas List of Streets
- Conservation Areas Map
- The Union Street Conservation Area Appraisal
- Supplementary Guidance: Shops and Signs
- Supplementary Guidance: Landscape
- Supplementary Guidance: Union Street Frontage
- Supplementary Guidance: Natural Heritage

CCMP - A strategy for transformational change.



2 OPPORTUNITIES

Aberdeen city centre offers place-making opportunities at night through revealing and highlighting its architecture, layered streets, its harbour, waterfronts, laneways, underpasses and squares.

2.1 Aberdeen City Centre Today

Aberdeen has an approximate population of 225,000 people with the population of the wider region being over 700,000. Union Street, running east-west and lined with classic granite buildings, is a key destination in the centre and the primary retail street. Directly off Union Street, to the south, is the medieval Merchant Quarter with The Green. Other notable zones further south and south west of Union street include the Station Gateway, the River Waterfront and the Harbour. Significant zones to the north of Union street are the Art Gallery Quarter, Union Terrace Gardens, Golden Square, Denburn Valley and the West End.

The city centre currently lacks character and presence at night, and is characterised by a discontinuity and unbalanced lighting appearance. While Union Street is illuminated marking the west-east city spine, there is no connection along north south axes, giving rise to a noticeable contrast in light levels between the brightly illuminated Union Street and most of the streets perpendicular to it and a lack in visual wayfinding.

The current lighting is focused on vehicular traffic with little consideration to the human scale. Illumination is largely functional, using high mast poles or floodlighting, and is aimed at the horizontal street surfaces. Most prominent façades, monuments and other features, key components of Aberdeen's daytime image, are generally not accentuated.

There is no distinction in the lighting approach between the various urban typologies such as commercial streets and squares. This lack of hierarchy and disjointed experience has an impact on legibility and perception of safety.

Lighting levels are generally poor although on some occasions street luminaires and signage have an excessively high intensity resulting in sharp contrast and lack of balance. Some of the present installations create glare and obtrusive spill light. Lack of consistency in light levels of luminaires, retail lighting and correlated colour temperature (CCT) in the same space or street is also apparent.

As identified in the CCMP, there is potential and opportunity for a more cohesive and consistent lighting approach and legibility of the night time city centre, for an increased focus on pedestrian activity, for an improvement of connectivity and creation of a distinct Aberdeen city environment at night.

Aberdeen Today - examples of current lighting

2.2 Opportunities for change

There are many opportunities throughout Aberdeen city centre to promote its history and provide a night time environment which encourages pedestrian night-time activity by creation of activation areas and pedestrian connection routes that provide sufficient light levels for comfort and safety.

Opportunities have already been captured within the CCMP within the theme “Light of the North” where the public realm will provide new attractions to draw people into the city and create well connected spaces.

Various schemes have been or are currently being implemented across the city centre to highlight significant spaces and buildings as they are being redeveloped or refurbished. These include Union Terrace Gardens, Aberdeen Art Gallery, Triple Kirk, Marischal College and Music Hall. These are the beginnings of the transformation of the city at night.

Future lighting projects and lighting improvements need to be aligned with the public realm improvements identified in the CCMP. As Aberdeen is undergoing a range of changes and re-developments, the overall lighting strategy is based on guidelines for the various types of spaces in the city centre which can be adapted to new and changing circumstances. For these guidelines to be relevant, the Aberdeen city centre and streetscape has been translated into a range of typologies to suit the different urban night time requirements.

Through stakeholder and public engagement, key areas were identified to promote change to the night time environment, taking into account the evening economy and public safety. These, together with the review of the city-scape, historic buildings and lighting topologies form the basis of the proposed projects as presented in section 3.5.

A precedent study has been undertaken to inform and inspire the lighting concepts. Benchmarking projects and precedent studies are used to learn from others experience, adapt to local needs and achieve the appropriate balance between various often competing requirements.

Beyond the engagement process undertaken for the development of this strategy, there are various opportunities to collaborate with and involve different stakeholder and community groups. Through this involvement, the engagement process will continue into the actual lighting design of projects, ensuring local input and relevance.

The advances in lighting technology allows for more creative potential within the lighting projects and for changes to the way that lighting is controlled, reducing its adverse effect on sustainability and stimulating night-time activity simultaneously.

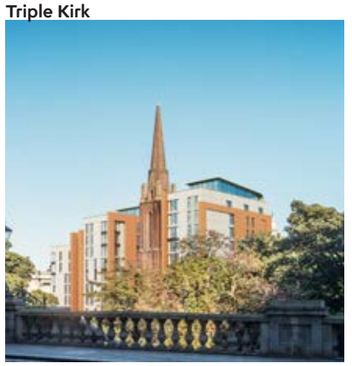
With the current developments in lighting technology and luminaire equipment there is ample potential to reduce costs and carbon footprints of lighting installations, also allowing them to easily integrate within the existing city structure.

> “There’s a defiant separateness to Aberdeen with its silvery granite and prominent port”
>
> Rough Guide to Scotland

Union Terrace Gardens

Aberdeen Art Gallery

Triple Kirk



Marischal College

Stakeholders Engagement workshops, identifying areas of change.

Precedent studies for lighting

3 CREATIVE LIGHTING STRATEGY

The creative lighting strategy focuses on the pedestrian experience within the night-time environment, and unifies a unique Aberdeen lighting identity to highlight the Aberdeen architecture, waterside destinations and character precincts. These elements collectively facilitate the legibility of the city centre through illumination.

3.1 Lighting strategy framework

The strategy framework comprises of:

Vision: The aspiration of the city centre

Objectives: The goals of the creative lighting strategy

Typologies: Coherent lighting guidelines for the various space typologies apparent in the city centre, to be implemented through projects.

Projects: Lighting projects for distinctive city centre areas

The typologies and projects set out two strategic directions:

- A coherent overarching set of guidelines providing a co-ordinated method for a project approach to lighting across the city, which can be applied in the continuously changing urban environment of Aberdeen
- A set of catalyst projects, consisting of targeted creative lighting applications which are designed in line with the guidelines and enhance the city image, its legibility and the night-time experience of pedestrians

This strategy has been structured to allow for adaptation in implementation due to changes in technology, urban space development or context. Additional projects may be developed and proposed in due course following the methodology and guidelines that have been presented.

3.2 The vision

The vision of this creative lighting strategy to create

An inspiring night time experience for a vibrant city through creative lighting

Aims to revive the historic city centre, create a connected city for people at night time and improve vibrancy and quality of life. In line with the CCMP, it sets out to add to the city centre's vitality and people's enjoyment, regardless of interests or means.

3.3 Guiding objectives

To achieve this mission, six lighting objectives have been established through translation of the CCMP objectives into lighting specific project aims:

Unique Aberdeen
Emphasising Aberdeen's unique identity at night-time

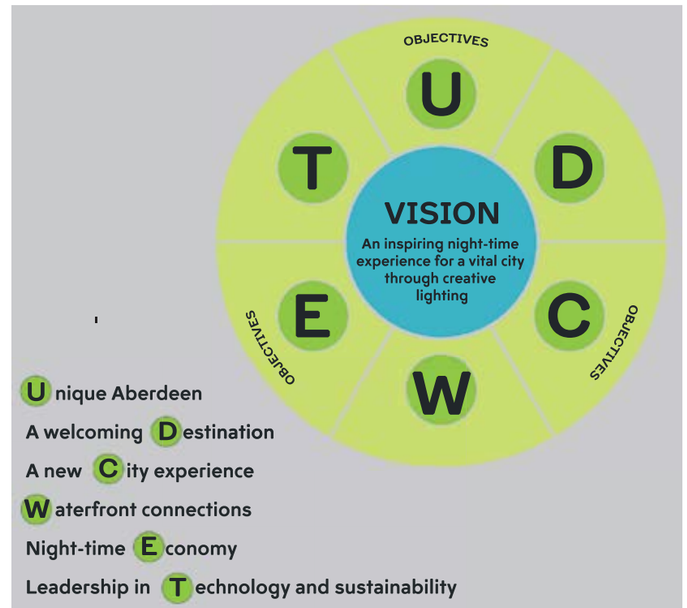
A Welcoming destination
Making the city safe and welcoming at night by creating an inviting night-time experience with focus on the human scale

A New City Experience
Introducing creative interventions, surprising lighting features and activated spaces at night to enable a new experience of night-time Aberdeen.

Waterfront Connections
Making visual connections and links to the waterfronts.

Night time Economy
Promoting night-time economy through inviting and engaging lighting.

Leadership in technology and sustainability
Showcasing leadership in technology and sustainability of the lighting installations and the city as a whole.



Aberdeen in colour - vision and objectives

3.4 Typologies and Guidelines

To achieve coherence of lighting treatments across the city centre, at the same time allowing for changes in the urban fabric and city development, the strategy is communicated through a series of lighting guidelines for space typologies that cover the city centre area. The following typologies have been identified as relevant for Aberdeen City Centre; the related guidelines are to be tailored to each project:

Primary Streets
Consisting of three types - gateway streets, main city arteries and key nodes

Mixed used neighbourhoods
Smaller scale streets including a mix of uses but predominantly residential and retail, seen as a traditional urban area.

Underpasses and connections
Tunnels underpasses and staircases connecting streets and bridging different levels.

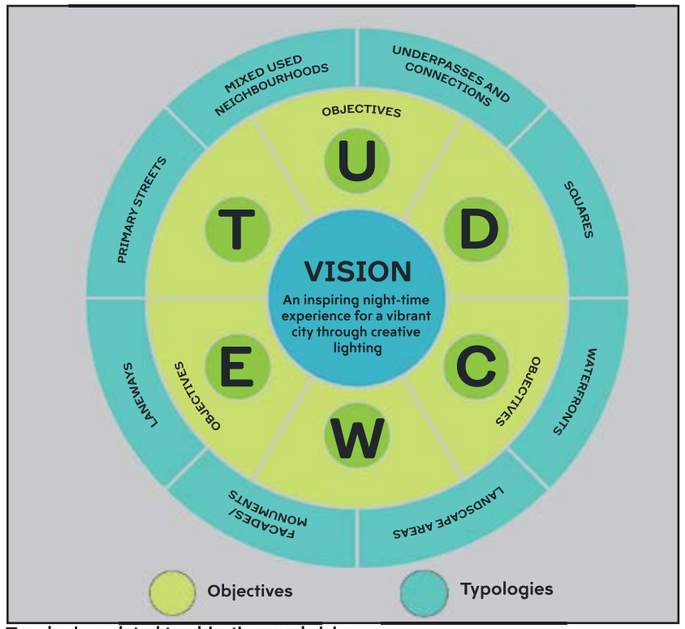
Squares
Public open spaces, which can be used for community gatherings.

Waterfronts
Riverfront and harbour front.

Landscape areas
Recreational green spaces .

Façades and monuments
Significant and historic Aberdeen architecture and sculptures

Laneways
Small narrow and dense streets with commercial and mixed use focus.



Typologies related to objectives and vision

The Creative Lighting Strategy is a two layer approach. Guidelines for the entire city centre, ensuring coherence are provided through the typologies section. They set the standard for the base layer of exterior lighting within the city centre through creative lighting projects

Application approach - The lighting strategy addresses the legibility of the city and provides visual amenity for an improved night-time experience.

Proposals for creative lighting projects should be assessed by Aberdeen City Council on a case-by-case basis, taking into consideration the overall design, the site context, and compliance with the requirements of this strategy.

Guidelines
The guidelines set the range of strategic lighting parameters for creative lighting projects within each typology, based on best practice guidelines. Site specific adaptation will be required.

The guidelines recognise the importance of creative 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. Creative lighting projects can also facilitate a unique identity and recognisable night-time environment by providing a clear and structured night-scape, emphasizing landmarks, defining spatial boundaries and increasing the legibility of the urban nightscape.

Comfort, experience and the perception of safety are key priorities and encompass a variety of issues including:

- The creation of a comfortable and glare-free night-time environment which embraces light and shadow.
- The provision of sufficiently lit spaces with considerations of appropriate illuminance levels as well as lit appearance and brightness (luminance).
- The integration of lighting and daytime appearance of lighting assets.
- The interaction with space, structure, form and material.
- The co-ordination of public and private lighting.
- The assistance in wayfinding and orientation.

Lighting levels (illuminance) set the base requirements for an acceptable lighting scheme, however perceived brightness, the quality of light, colour of light, luminaire distribution and atmosphere created are important for the overall perception of space and pedestrian comfort. The Creative Lighting Strategy sets out the design intent criteria and aspirations for projects in certain areas. The intention is to raise illuminance and perceived brightness with artistic lighting elements thereby increasing activity and raising safety through passive surveillance.

Setting quantitative 'lighting levels' for the functional lighting applications include consideration of a range of factors including public transport routes, pedestrian, cyclist and vehicle density, crime statistics, legibility of wayfinding and signage, and the importance of enhancing the area.

This document references the following British standards, setting the base minimum requirements for lighting projects in streets and other public spaces:

- BS EN 13201-2: 2015: Road lighting. Performance requirements. (BS EN 13201 identifies lighting classes and identifies the performance requirements of each)

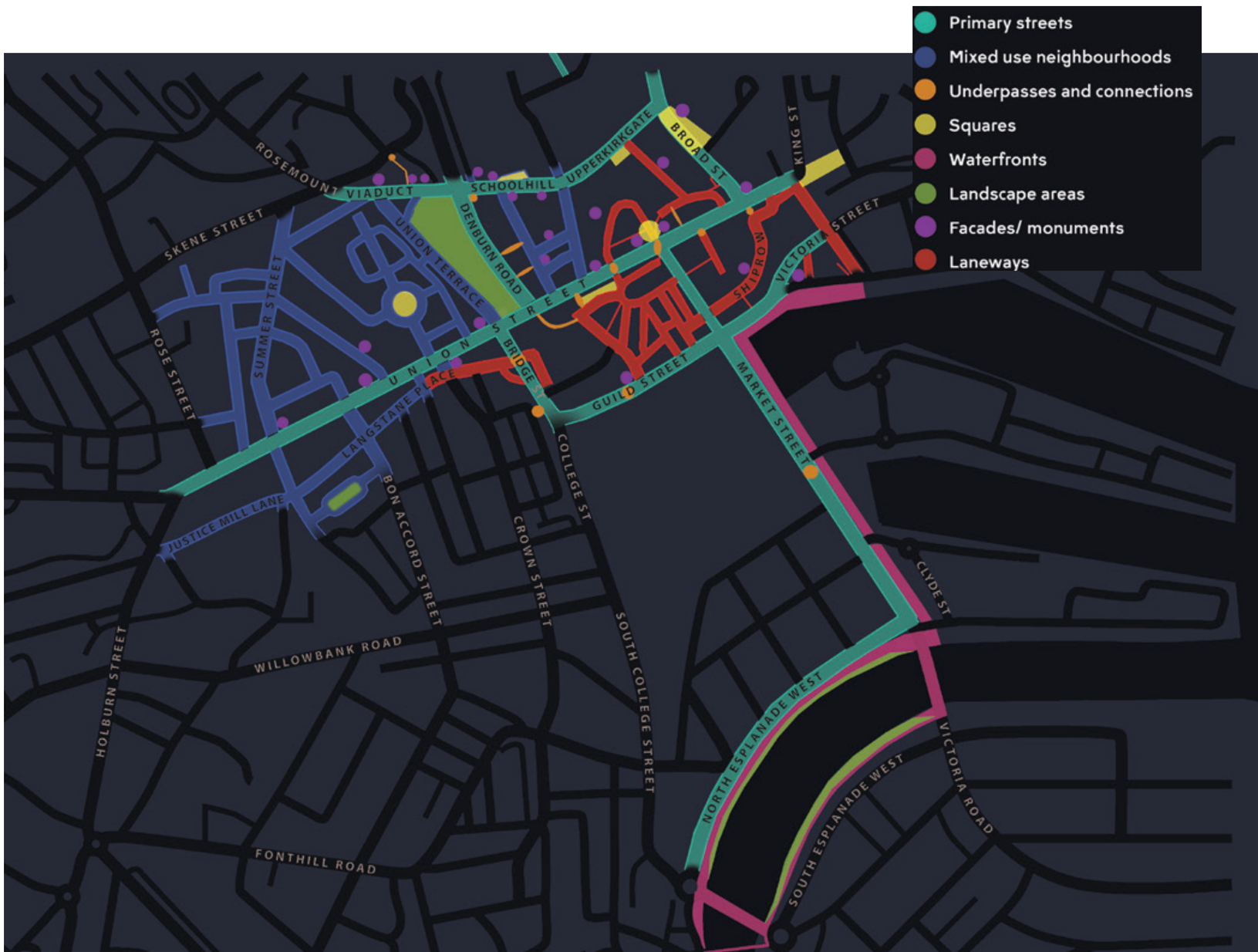
- BS 5489-1:2013: Code of practice for the design of road lighting. Lighting of roads and public amenity areas. (BS EN 5498-1:2013 provides additional road lighting guidance to BS EN 13201 including on how lighting classes are selected and covers all types of roads as well as public amenity areas.)

- ILP GN01 2011: Guidance notes for the reduction of obtrusive light. (ILP GN01 defines the environmental zones light conditions and obtrusive light limitations for external lighting installations within the different environmental zones. It is recommended that local authorities specify the environmental zone with the development plans.)

These provide quantitative lighting requirements for roads and exterior spaces as well as regulations for obtrusive lighting, to be applied in creative lighting projects.

Based on the relevant standards, the typology guidelines provide a range of lighting levels and requirements for creative lighting projects applicable to a range of contexts and situations.

Lighting is one component that needs to be considered as part of an overall streetscape and urban realm upgrade



Map 2 - Typologies

project. Within the urban context, lighting should not be considered in isolation and needs to be to be co-ordinated with other elements such as street trees, furniture and signage. All street lighting applications for a specific project are ideally to be designed at the same time and where possible should be designed in conjunction with the urban / landscape design of the street / area. Consideration should be given to the spacing between street trees and furniture and the reduction of visual clutter including the concealment of luminaire control gear.

Creating evening vibrancy

Strategies that employ the lighting of features, interventions, markers and nodes must be designed to attract and draw the pedestrian comfortably between each night-time experience, laying a vital role in wayfinding through the city and the communication of its culture, history and character.

Lighting overlays, connections and interventions should employ dynamism and technology as part of the designed element and also play a part in wayfinding.

Lighting overlays, connections, and interventions will generally include:

- Dynamic lighting of urban structures
- Projections
- Marker lighting (where appropriate)
- Temporary public art
- Light artworks
- Festivals

The lighting of installations should minimize glare and visibility of light sources and luminous surfaces; lighting is not to distract but enhance an area. Mounting of luminaires is not to affect viewing of the city streetscape, architecture, landscape, feature, artwork or sculpture.

For new installations, or where the artist/ sculptor/ architect/ landscape designer is known, collaboration and dialogue is encouraged to ensure the lighting is appropriate to the urban design and aristic intent.

The following are not supported:

- General floodlighting
- Artwork mounted luminaires (unless luminaires form part of the artwork)
- Strobing or flashing lighting
- light sources directed to the observer's point of view

Sustainable design

With the goal to preserving the future of our environment, responsible lighting solutions with respect to sustainability and energy consumption are a key requirement for any lighting project within Aberdeen City Centre.

Luminaires can cause discomfort or glare if not selected, directed and shielded correctly, which can affect adjacent residences, reduce visibility and cause distractions to both pedestrians and vehicle drivers.

The appropriate selection of lighting equipment, mounting details and aiming is to ensure the minimisation of light pollution, spill light and impact on the evening environment and includes the following:

- Direct and focus light onto surfaces as required for specific applications.
- Select luminaires with precise beam distribution and cut-off as required for a particular application.
- Use shielding and masking techniques to minimize stray light into the sky including baffles and glare shields. The lens selection is also to be considered when selecting luminaries.
- Use full cut-off fittings where possible.
- Consider and respect residential amenity as well as the overall appearance of the city and its skyline.

To avoid over-lighting:

- Illuminance levels are used as a guidance only and due consideration is to be given to the surrounding area, distribution, contrast and surface reflectance.
- Generally, the provided light levels should not be exceeded unless there is a specific instance and reason.
- Colour is to be used in a considerate manner, avoiding possible saturation and disjoint appearance.

The play of light and shadow and lighting modulation rather than floodlighting is encouraged.

The solutions implemented in the lighting design need to take into account environmental impacts by means of balancing a number of issues to achieve an excellent overall energy efficiency, economy and environmental responsibility. The following key requirements need to be considered in each lighting project:

- Choose appropriate luminaire types and light sources to minimise energy consumption, maximise efficiency and

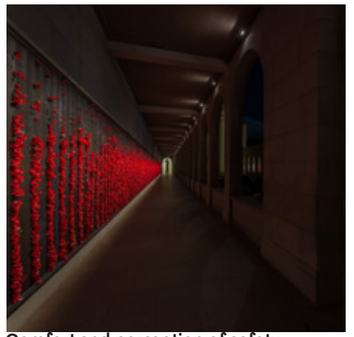

Good balance of light


Integration into architectural fabric


Influencing character of streetscape


Emphasising landmarks


Engaging city experience


Comfort and perception of safety


Solar powered luminaires


Attracting evening crowd

obtain low maintenance expenses whilst considering their qualitative spectral properties.
- Provide appropriate and flexible and adaptable lighting control that allows for dimming and adjustments at certain times.
- Facilitate the monitoring of energy consumption where possible via lighting control systems, smart meters and wireless technologies.
- Locate photo-voltaic cells where appropriate to provide energy for lighting elements, maximizing energy efficiency and minimising environmental impact.
- Consider energy efficiency not only in the luminaire operation, but also in manufacture and installation.
- Minimise and mitigate any adverse effect on flora and fauna; focussing on avoiding disruption of the functioning of specific organisms such as birds, fish, bats and insects.

Lighting sustainability considerations not only address environmental protection but also contribute towards economic development, social equity and justice, whilst avoiding the over consumption of key natural resources.

The impact lighting can have on economy and social behaviour has to be balanced with energy usage. The following issues are to be considered:

- Use controls to enable the facilitation of various moods, interactive interfacing, creating a distinctive interplay of light levels, and adjustments and changes in future use and function.
- Make provisions for events, community and tourist use and consider these applications in the design.
- Design lighting to facilitate activity in the night-scape.
- Design lighting for humans and consider human health, perception and behaviour where applicable and appropriate.
- Include relevant community groups and stakeholders in the design where possible to ensure local issues are addressed and the design remains relevant.

Technology and Controls

Meeting the key strategic objective, to demonstrate leadership in technology, the following needs to be considered and where appropriate incorporated in each lighting project:

- Provide the capacity, quality and reliability of infrastructure required for each project, considering current as well as future loads, redundancy and flexibility.
- Integrate with digital technology where possible and appropriate to enable a future 'smart city'.
- Enable data connection and controllability to enable 'intelligent lighting', such as pre-set scene setting, seasonal dimming, dynamic dimming and colour control. Consider wireless technology such as WiFi and Bluetooth for lighting control where relevant and infrastructure is limited.
- Where possible and appropriate to the installation, incorporate multiple functionality into the lighting installation and lighting infrastructure, including sensors, data transfer/ connectivity, power sources, various lighting requirements and other technology such as cameras and speakers.
- Identify opportunities for logging data, providing tools for analysis and review in the long term.

For each project, investigate the possibility of using existing infrastructure. Where new infrastructure is being installed, consider and address the longevity aspects of the technologies used, considering the evolution of technologies and the likelihood of certain hardware or software being phased out in time.

Different degrees of control and dimming are recommended throughout Aberdeen city centre, dependent on the areas location and use. Use controls to enable the facilitation of various moods, interactive interfacing, creating a distinctive interplay of light levels, adjustments in future use and function where a balance with economic and social consideration is required. The following needs to be taken into consideration:

- In areas of night-time activity the lighting is set up of layers which are to be dimmed down or changed dependent on the day and time.
- Certain areas in the heart of the night-time activity would require intervention lighting, where the levels can be raised if incidents occur.
- Dimming may be used in certain areas outside peak use times to reduce, but not extinguish, overall lighting levels which will reduce the energy consumption. It is permitted under the provision that sensor-timed higher levels of light are built into the controls for safe intermittent passage where required.
- Consideration is to be given to night time control to reduce or turn-off shop-front lighting after curfew if the establishment or retail shop is not open.

Smart control technology has been highlighted to be introduced into Aberdeen's exterior lighting system to enable flexibility for lighting level adjustments and implement smart city solutions. Automating lighting control and considering switching groups, allows for more dynamic control and the reduction of energy consumption when specific lighting elements may not be required. Smart dimming when lighting groups are not required also reduces greenhouse gas emission, maintenance costs, and reduces light pollution.

Lighting control generally consists of two elements- The first element is the physical lighting control equipment that switches or dims the appropriate lighting on and off at the relevant times. The second element is the personnel management control that ensures the lighting systems are fully maintained and operational in accordance with the objectives of the creative lighting strategy and the resulting procedures.

To assist in the maintenance and control of the lighting and allow for adjustment to various lighting levels and the level of interaction required, open access control technology should be used where practical to automate the control and help to establish maintenance requirements.

The following is a list of items to be considered in the lighting control strategy;

- Level of technology required.
- Dimming of fittings, both static 'set and forget' and dynamic for special occasions.
- Separate control/ dimming of street and pedestrian lighting elements.
- Flexibility to enable isolation and stage switching of certain elements.
- Astronomical Time clock controller (sunset switching).
- Provisions and procedures for temporary special event lighting (dynamic lighting or subtle colour change).
- Grouping of lighting fixtures according to locations under similar environmental conditions such as daylight availability.

An additional benefit of dynamic dimming lighting control is the effect it can have on lighting level requirements, allowing adjustments in relation to the use of the space, resulting in running cost saving and a more comfortable night time environment.

Lighting Equipment

Consolidation of lighting equipment (such as pole types, luminaire product ranges, light source technology and control systems) across projects into specific typologies assists in making the environment visually coherent. This is particularly important for maintenance and in preventing uncoordinated lighting approaches as the complexities of a developing city centre increases, bringing with them issues like glare and aesthetic inconsistencies.

The choice of light fitting and source is also of great importance. When considering the lamp and the nature of light it provides, the following should be taken into account:

- Light distribution
- Energy efficiency and source efficacy (the output in relation to energy)
- Asset life
- Colour appearance and colour rendering
- Form/ size/ aesthetic appearance and integration into the urban/ landscape/ architectural design
- Lighting control possibilities
- Quality of material and company track record

Vandalism is a key consideration in the selection and mounting of a luminaire. Considerations for luminaire selection include:

- IK Rating: The IK rating of a luminaire refers to the degree of protection by enclosures for electrical equipment against external mechanical impacts in accordance with IEC 62262:2002 and IEC 60068-2-75:1997. The IK Rating ranges from IK00 for luminaires not protected to a rating of IK10 that protects a luminaire against 20 joules impact.
- Materiality and design of luminaires and brackets should be able to withstand environmental conditions of the site.
- Fixings to be concealed and tamper proof where required.
- Mounting height to be considered for public access.

3.4.1 Navigating through the city

The creative lighting strategy typologies have been designed to activate, attract evening crowds and provide for good night time navigation. This is done by:

- Applying luminaire types specific to zones
- Increasing legibility of city areas and typologies through consistency in approach
- Creating activation zones such as Squares and laneways
- Highlighting pedestrian routes such as underpasses and link routes for wayfinding
- Illuminating significant architecture, creating landmarks and a recognisable city skyline
- Highlighting city entry points.

These lighting elements which support legibility and wayfinding, are found within the creative lighting strategy typologies and projects.

The main entry points into the city centre have been identified (see map 3), relating to the main surrounding vehicular arteries of the city and the public transport hubs. When entering Aberdeen City Centre, the lighting typologies form a coherent unified approach that will be applied to the city emphasising the street hierarchies through the types of luminaires and lighting approaches.

Additionally, emphasis is given to key façades, monument and bridges on the entry thresholds that can be identified as a landmark by illuminating these.

The entry thresholds could be accompanied with lighting installations and lighting overlays where appropriate and where no key landmarks are already present.

The primary routes luminaire poles are proposed as multifunctional poles that have the ability of including banners and a recognisable coloured light ring. On the key primary routes welcome signage or a specific coloured light ring can be included on the street lighting poles.

Pedestrians movement between the urban quarters is promoted via lighting of the laneways, underpasses and connection routes. Lighting treatments to these typologies

will be inviting and create a unique identity during night-time for general orientation within the city; they have been designed with a more dynamic approach, whilst still ensuring a sense of safety to encourage usage. By promoting the smaller pedestrian and cycling routes as connection routes between the different urban quarters, the city is opened up beyond the primary streets.

Making night-time connections beyond the primary streets, the North-South connection is emphasised, starting at the train station and Union Square centre, through the laneways up to the Bon Accord centre at George street.

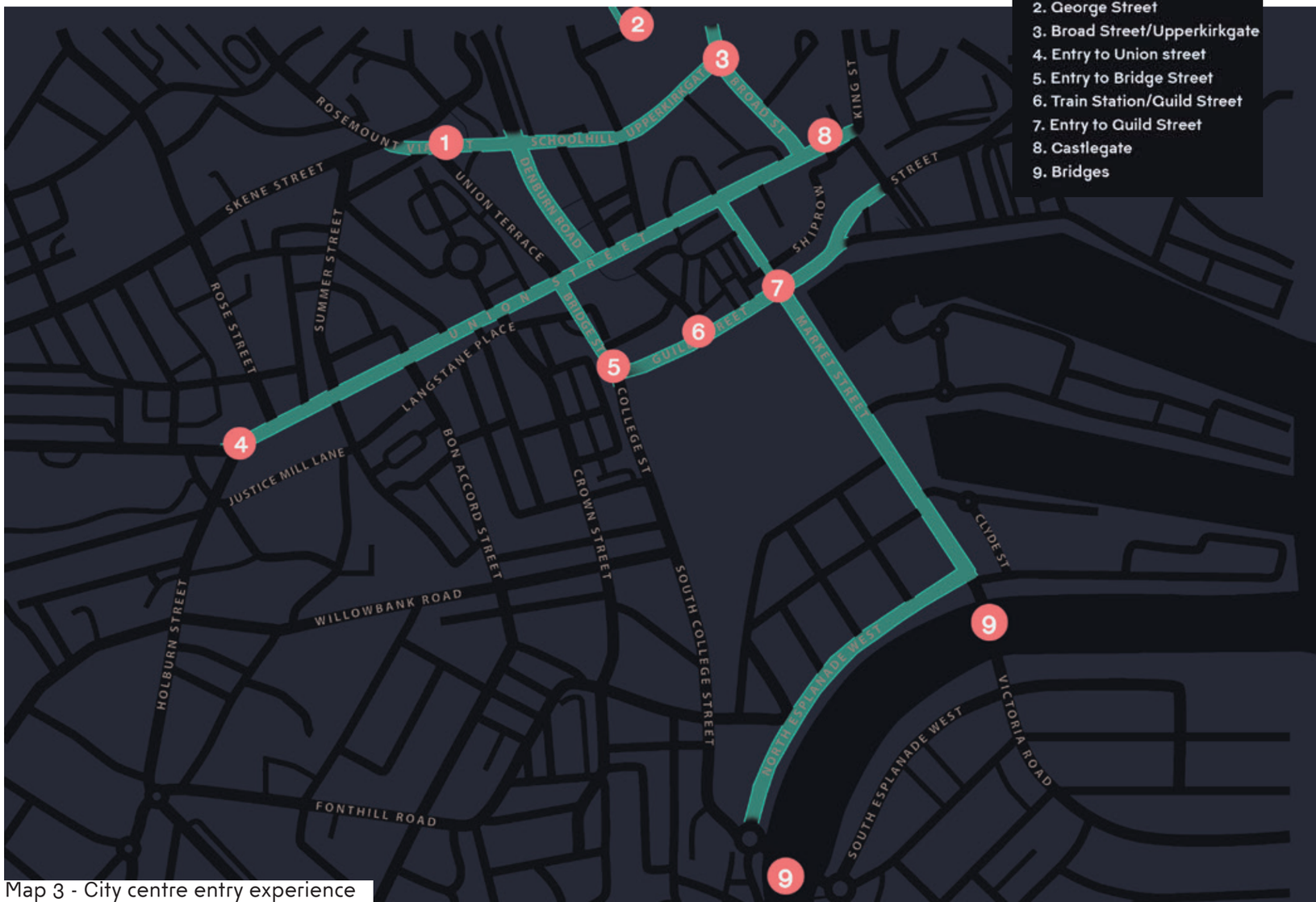
Denburn Road East

One key location for city wayfinding has been identified as Denburn Road East. This is location suited for a lighting installation, where both incoming traffic and pedestrians would view the installation. Within the typology section:

- Denburn Road is identified as a primary street within the city centre.
- The Denburn Road to Rosemount viaduct connection is identified as a pedestrian link route.

To aid night-time navigation through the city, it is suggested that additionally to the 12 identified projects within this document, a lighting installation at Denburn Road East is developed. The design will need to be developed in line with the design of Union Terrace Gardens to ensure that the two complement each other.

Denburn Road East potential entry threshold for art installation



Map 3 - City centre entry experience

3.4.2 Primary Streets

As Aberdeen city centre is the primary destination for locals and visitors, and as a primary area of activity and growth, there is a greater requirement for safe pedestrian and vehicular access within the city centre at all times. The creative lighting strategy guidelines reflects this, defining the primary streets with higher illumination levels compared to surrounding peripheral areas.

The primary streets within Aberdeen city centre have been split into three types to be able to define the type of required lighting:

<u>Gateway streets</u>
Providing primary access to the city centre, where the emphasis is on vehicular traffic.

<u>Main city arteries</u>
Part of the key pedestrian network within the city centre, where the street lighting is more integrated with the surrounding urban environment.

<u>Key nodes</u>
Streets which form key connecting areas with the emphasis on pedestrian and cyclist circulation.

Most of the primary streets are already adequately lit, however they lack design consistency, modernised technology and smart systems. Therefore the main objectives for the creative lighting projects when appropriate, to:

- Provide an identity to the primary street types and the streets of key importance.
- Provide adequate lighting levels, avoiding overlighting and high contrast.
- Integrate smart systems.
- Integrate any further requirements such as cameras, speakers, accent lighting, banners,etc. within the lighting infrastructure to reduce street clutter.

Design approach for creative lighting
Projects in the three different street types will have unique lighting treatments to reflect their requirements.

The utilisation of multi-function poles (MFP) aims to reduce visual streetscape clutter by integrating services and providing a consistent lighting aesthetic within a project.

For consistency and identification, a circular luminaire head is proposed for the lighting


Union street


Broad street

Bridge street

Virginia street


Guild street


Schoolhill


George street


North Esplanade West


Rosemount Viaduct

fixture family, including MFPs, catenary elements and pedestrian poles, with the circle representing connection and connectivity between city areas.

Gateway streets
The gateway streets are generally larger with multiple lanes providing the main routes into the city for traffic. Creative lighting projects should promote multi-functional poles with the following criteria:

Lighting Colour Temperature: 3500-4000K
Pole Type: Multi functional smart pole.
Pole Height: 10m
Minimum CRI: RA85
Distribution: Asymmetric widespread distribution for optimum street coverage.
Other notes: Corrosion resistant finish. RAL colour to be approved by Aberdeen City Council.

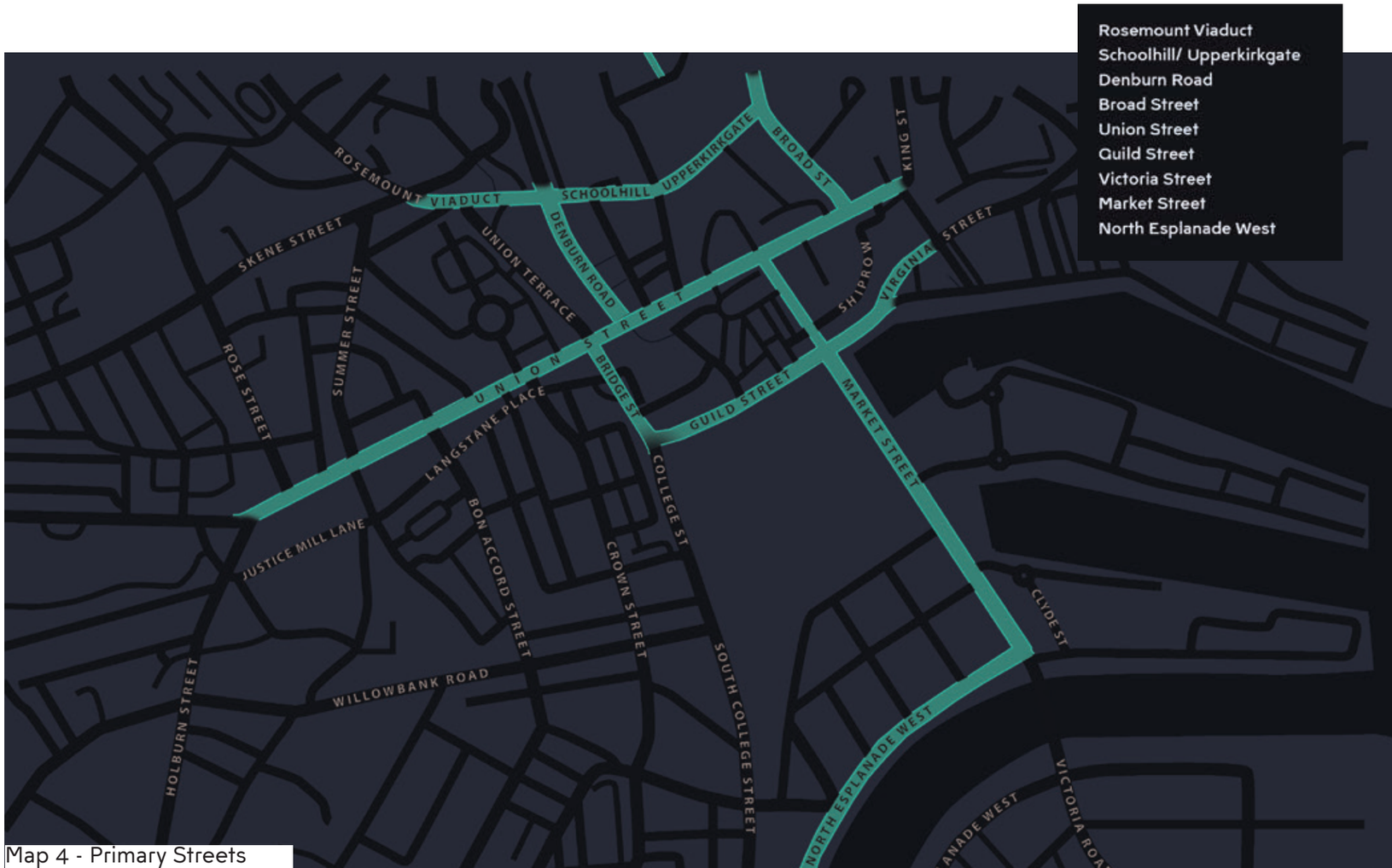
Projects should consider pedestrian lighting and experience. Appropriate lighting elements for human scale and human activity can be added where appropriate.

Main Arteries
The main arteries are the main streets linking back to Union Street. Multi-functional poles for creative lighting projects with the following criteria should be promoted:

Lighting Colour Temperature: 3500-4000K
Pole Type: Directed light with asymmetrical flat beam light distribution from smart pole top.
Pole Height: 6m
Minimum CRI: RA85
Distribution: Asymmetric widespread distribution for optimum street coverage
Other notes: Corrosion resistant finish. RAL colour to be approved by Aberdeen City Council.

Key Nodes
Union street is the key commercial street of the city. By providing it with a unique lighting design it provides a firm identity whilst providing sufficient functional lighting. See chapter 3.5 for the project concept for Union Street. This promotes:

Lighting Colour Temperature: 3500-4000K
Luminaire Type: circular catenary luminaire with directional light as per project, including smart technology.
Mounting Height: Same height as current wall mounted luminaires.
Minimum CRI: minimum RA85



Map 4 - Primary Streets

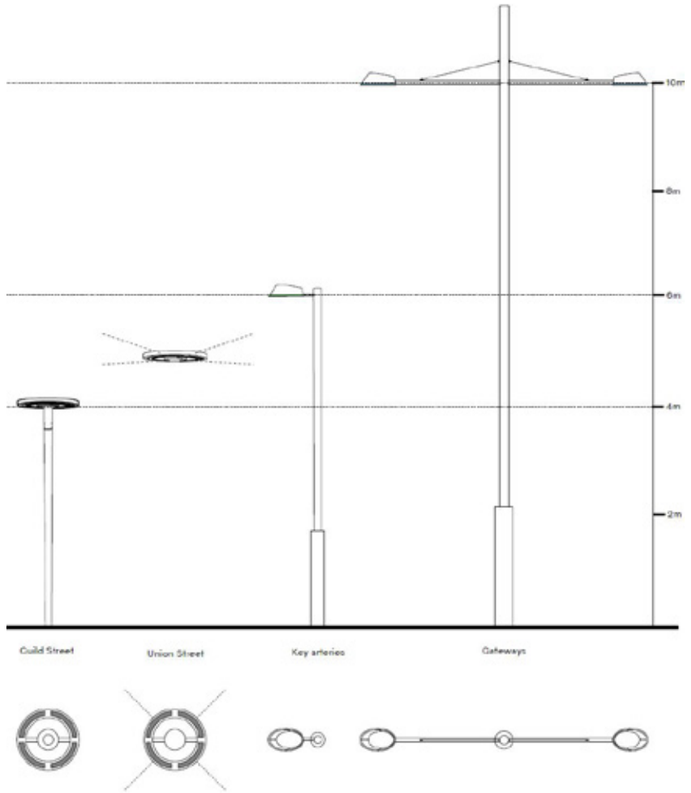
Distribution: Symmetric widespread distribution for optimum street coverage.
Other notes: Corrosion resistant finish. RAL colour to be approved by Aberdeen City Council.

Guild Street will form a pedestrian link between the train station, mall, harbour and city centre, designed as an evening activation area, for which a more distinct luminaire is to be selected that allows a unique identity to the area.

Lighting Colour Temperature: 3500-4000K
Luminaire Type: Pole mounted luminaire with a circular form similar to that of Union Street. Unique detailing to be integrated.
Mounting Height: 4m poles
Minimum CRI: minimum RA85
Distribution: Dependent on the proposed luminaire, optimum street coverage is required where the vehicular traffic crosses with pedestrian (buses, taxis, cyclists).
Other notes: Corrosion resistant finish. Luminaire proposal to be approved by Aberdeen City Council.

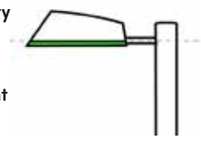
Street type	Street name	Lighting Elements	Quantitative measures	Quality measures	Considerations
Gateway	• North Esplanade West • Market Street • Virginia Street • Denburn Road	Multifunction Pole to replace existing street pole	Per BS EN 13201-2: 2015 and BS 5489-1:2013	3500 - 4000K Min RA70, 85 for pedestrian areas	Lighting elements for human scale where appropriate
Main Arteries	• Rosemount Viaduct • Schoolhill /Upperkirkgate • Broad Street • Bridge Street • George Street • Market Street between Guild and Union St	Multifunction Pole to replace existing street pole	Per BS EN 13201-2: 2015 and BS 5489-1:2013	3500 - 4000K Min RA70, 85 for pedestrian areas	Lighting elements for human scale where appropriate
Key Nodes	Union street	Circular catenary luminaire with smart technology	Per BS EN 13201-2: 2015 and BS 5489-1:2013	3500 - 4000K Min RA70, 85 for pedestrian areas	Union street is the main spine and commercial street of the city
	Guild Street	Circular post top luminaire with smart technology	Per BS EN 13201-2: 2015 and BS 5489-1:2013	3500 - 4000K Min RA70, 85 for pedestrian areas	Guild street is to be developed into key pedestrian area, mixed with cycle, taxi and bus use.

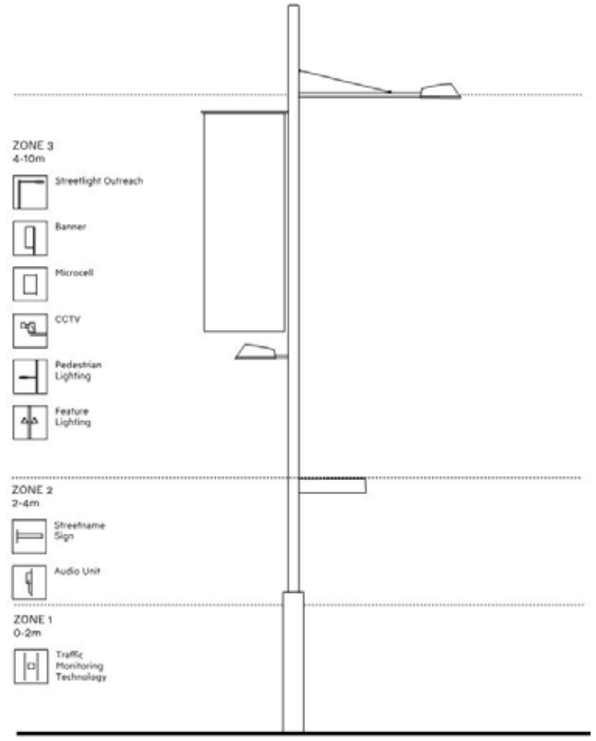
Creative lighting considerations for primary streets.



Luminaire types treated as one family across projects for the main streets.

**Opportunity for street identity through inclusion of colour halo to the edge of the luminaire.
Consideration of this element for entry points into city.**





Multi-function capabilities of gateways and main arteries streets.

3.4.3 Mixed Use Neighbourhoods

The mixed use neighbourhoods are defined as areas that include both residential and commercial properties, where higher light levels are required without creating unnecessary spill light to the residential properties and provide lighting at a human scale.

The main objectives for creative lighting projects are:
- Provide human scale lighting that will provide sufficient lighting for safe movement.
- Control the quality of the light and direction of the light to reduce obtrusive light spill into neighbouring properties.
- Set a standard for shopfront windows to retain the consistent ambience through the mixed use spaces.
- Set a standard for signage lighting to ensure excessive spill light is omitted and signage of the shop takes into consideration the surrounding environment.

Design approach for creative lighting

Lighting
The lighting to the mixed use neighbourhoods should be provided by pedestrian scale pole mounted luminaires that have a similar circular shape to those used for the primary streets to ensure that they relate to each other.

The luminaire type will be smaller and more delicate to reflect the type of space; to include:

Lighting Colour Temperature: 2700-3500K
Luminaire Type: Pole mounted luminaire with a curved form similar to the Primary Streets
Mounting Height: 4m poles
Minimum CRI: minimum RA85
Distribution: Directed light with asymmetrical flat beam light distribution from pole top without back spill to avoid spill light into residential properties
Other notes: Corrosion resistant finish. Luminaire proposal to be approved by Aberdeen City Council.

Shop and signage lighting
To ensure shop and signage lighting doesn't produce obtrusive lighting to its surrounding residential areas, the window displays should be designed so that the brightness of all light sources, luminous surfaces and lit surfaces that are visible from the street, including digital and internally lit signage and billboards, should be of an appropriate luminance to suit the surrounding environment. Consideration is to be given to night time control to reduce or

Summer Street

Chapel Street

Crimon Place


North Silver Place

Ruby Lane

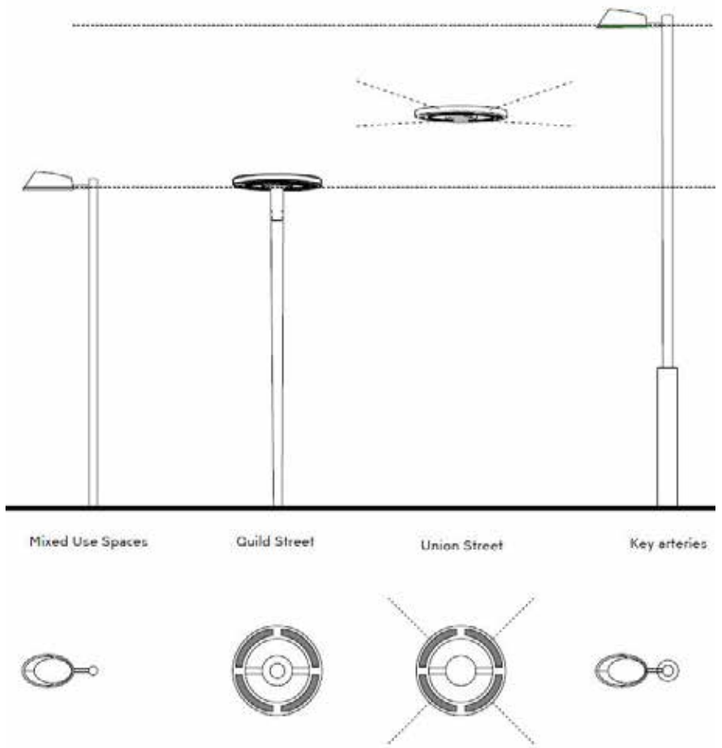
Langstane Place

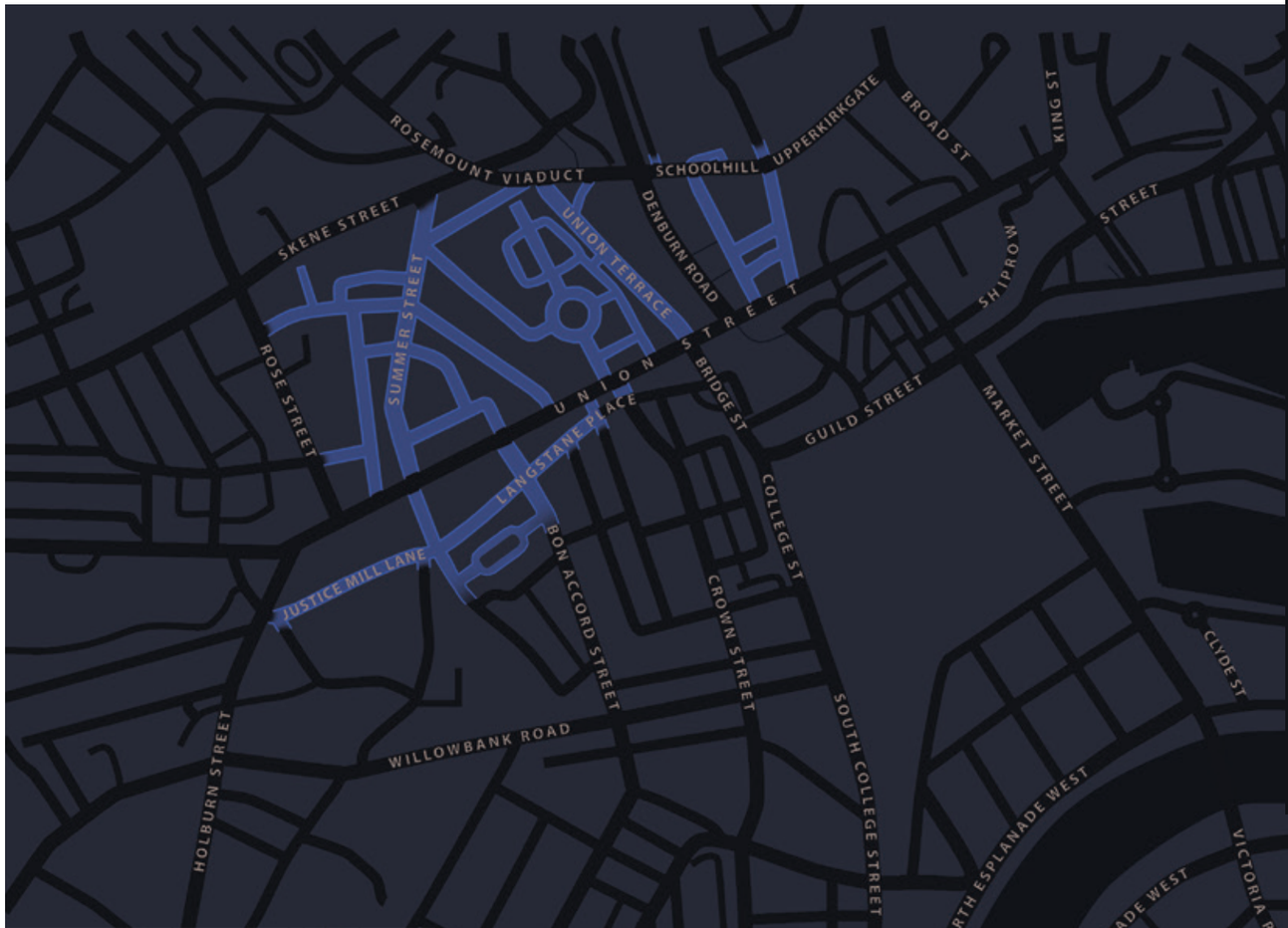
turn-off shopfront lighting after curfew if the establishment or retail shop is not open.

Lighting should focus on highlighting merchandise or internal surfaces rather than floodlighting and may be used to create a visual hierarchy. Luminaires should be located in a manner to reduce glare and reflections on the window surfaces to provide a considered lighting quality to the adjacent streetscape.

Lighting elements	Quantitative measures	Quality measures	Considerations
Street lighting	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85	Spill light to the surrounding residences.
Signage	Per PLG05: The brightness of illuminated advertisements, environmental zone 2 or 3 dependant.	A max of 4000K for whites. Special request required for use of colour.	Viewing angles from surrounding residences, Ensuring to fit within the streets context.
Shop front/ window display	No higher than the illuminance of the surrounding environment	Dimmed down or switched off after curfew.	Viewing angles from surrounding residences, Ensuring to fit within the streets context.

Creative lighting considerations for mixed use neighbourhoods.





Map 5 - Mixed use neighbourhoods

3.4.4 Underpasses and Connections

Underpasses and connections within the city centre provide a great canvas for a creative lighting approach to enhance general circulation routes. They are visually important for wayfinding and guidance through the city.

Key proposals for a creative approach to Correction Wynd and Donald's Way are included in chapter 3.5 as catalyst projects.

Comfort and the perception of safety is a key priority within underpasses and connections as well, ensuring they are sufficiently lit with considerations of appropriate illuminance levels as well as lit appearance and brightness (luminance).

The main objectives for creative lighting proposals are:
- Provide adequate lighting for comfort and safely.
- Provide visual interest for guidance and wayfinding.
- Reduce the potential for undesirable behaviour due to better lit spaces.
- Connection of prominent spaces.
- Creation of interest and attraction, drawing people into spaces off the primary streets

Design approach for creative lighting

The underpasses and connections are split into three different lighting approaches based on their context within the city.
- Underpasses
- Narrow pedestrian connections
- Exposed connections

<u>Underpasses</u>
Creative lighting should be provided that emphasises the inner curved architecture of the underpasses whilst ensuring sufficient visual brightness and light levels for comfort and safety. This can be provided using linear luminaires that are either floor recessed along the edges or surface mounted at the top centre. Luminaire mounting option should be project specific dependent on the location and whether art installations will be included. The luminaires should adhere to the following:

Lighting Colour Temperature: 2700-3500K, possibility for combining with contrasting colour or the ability to change colour where appropriate

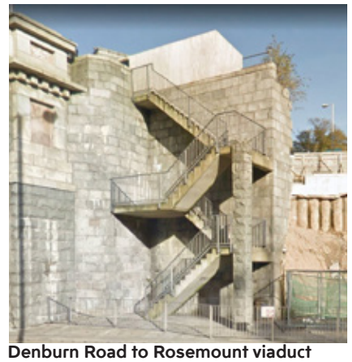

Correction Wynd underpass


Donald's way

McCrombie's Court


Windmill Brae


Bridge Street to Crown Street


Denburn Road to Rosemount viaduct

Luminaire Type: Inground or surface mounted
Minimum CRI: minimum RA85
Distribution: Symmetrical linear medium distribution.
Other notes: Corrosion resistant finish. Inground to be walk over or driver over with anti slip cover, dependent on location. Luminaire proposal to be approved by Aberdeen City Council.

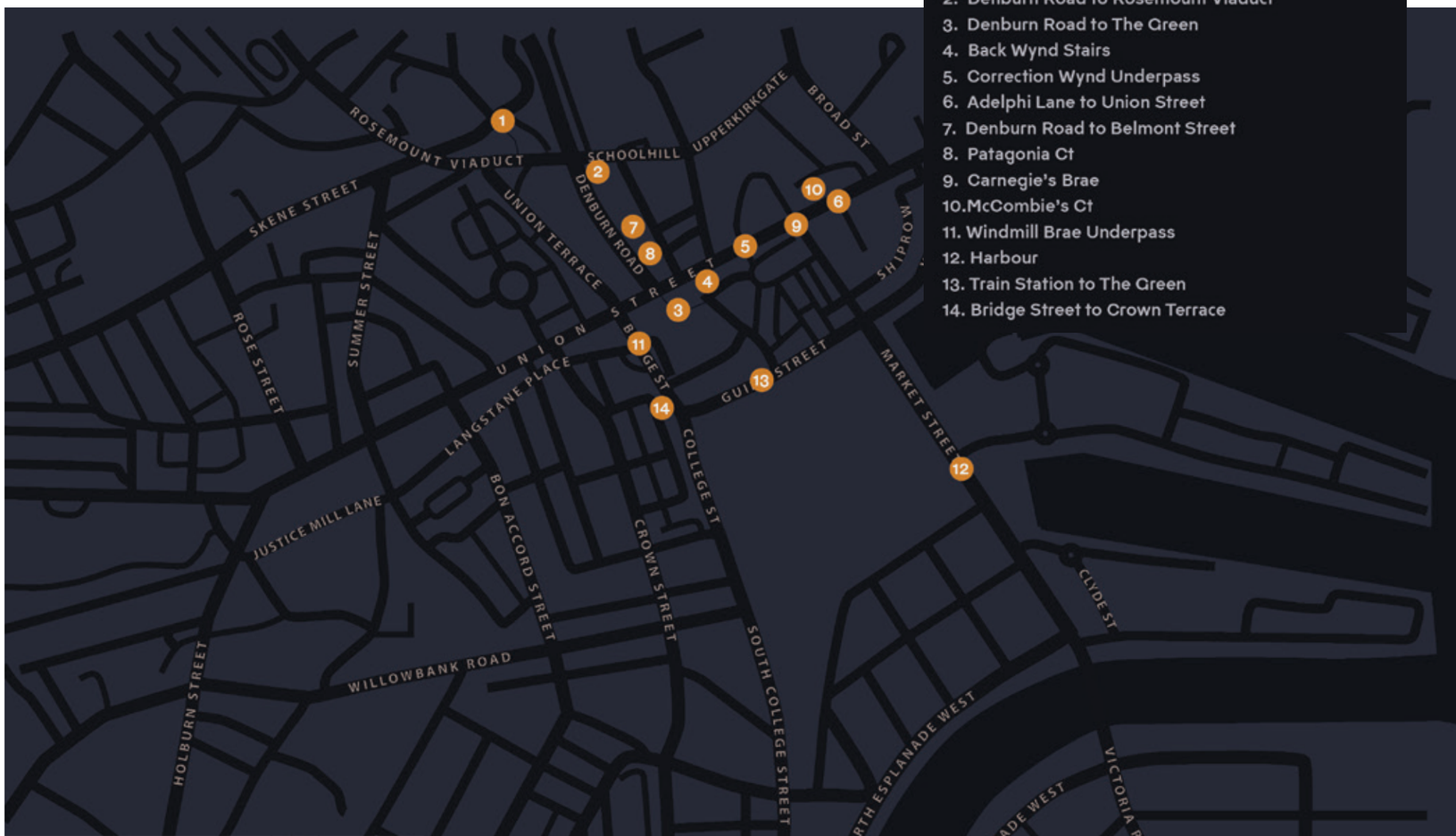
Lighting overlays of various nature (such as projections, light/shadow patterns, enhancing of specific features etc) are encouraged where appropriate to add to the character and create unique and attractive connections.

Narrow pedestrian connections
The nature of these connections is that they are quite secluded and hidden to the rest of the urban realm, allowing great opportunities for creative lighting to encourage pedestrians to use the routes. Lighting will be project specific, where the lighting design should fit in contextually with the surroundings and be of a human scale. Adequate visual brightness for comfort and safety will require to be demonstrated in the design proposals.

Exposed Connections
These connections sit within a larger streetscape where lighting languages are already defined. The connection is should highlighted for wayfinding and human scale interaction. This can be emphasised by a change in colour temperature, introduction of colour treatment or an art installation. The concept will have to be designed in context to the surrounding streetscape.

Lighting elements	Map numbers	Quantitative measures	Quality measures
Underpass lighting	3, 5, 6, 9, 10, 11	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85, colour incorporation dependent on the creative installation.
Narrow pedestrian connections	1, 2, 4, 7, 8, 10, 14	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85, colour incorporation dependent on the creative installation.
Exposed connections	12, 13	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85, colour incorporation dependent on the creative installation.

Creative lighting considerations for underpasses and connections.



Map 6 - Connections and underpasses

3.4.5 Squares

City centre squares are characterised by pedestrian only activity. They act as recognisable meeting places and spaces to gather, sit and relax as well as centres for events and activity. They provide opportunity for community activities, sitting areas and meeting areas. The squares should be lit with sufficient surrounding brightness and sufficient illuminance within the key areas to provide comfort and safety, but with modulation in lighting and a unique element to each square, creating uniqueness and variety.

Design approach for creative lighting

Lighting should be provided by unobtrusive and integrated column lighting with one or more of the following elements:

- Multiple smaller spots for accent lighting and zoning.
- Gobo projection.
- WIFI connection.
- Integrated solar panels.

Lighting Colour Temperature: 2700-3500K
Pole Type: Slim minimalistic poles appropriate to accommodate the above elements.
Pole Height: 4/6m
Minimum CRI: RA 85.
Distribution: Project dependent
Other notes: Corrosion resistant finish. RAL colour to be approved by Aberdeen City Council.

The Golden Square and Castlegate projects in chapter 3.5 are examples where a unique element is included to define each square. Castlegate introduces temporary seating elements with integrated lighting to promote the use of the square; historic features are lit to provide further visual brightness and identity. Golden Square introduces the play of light and patterns through the use of gobo projection, complimented by under bench lighting to frame the space.

The following lighting can be applied to provide additional creative lighting within squares:

Rigid or flexible linear luminaires recessed into architecture or street furniture:

- Light source/ luminaour surface is not to be visible or obtrusive.
- Luminaires diffuser should provide a homogeneous finish which will not shift in colour due to sunlight exposure.
- Materiality and properties of floor and furniture element needs to be considered


Golden Square


Schoolhill Square


St Nicholas Rooftop


Castlegate

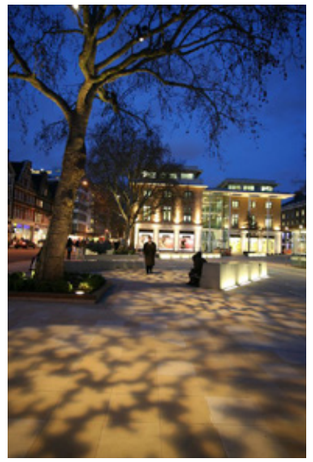

Broad Street


The Green

Spot lighting for accents, highlights or patterns:
- Luminaires should be discrete in size
- Mounting position, aiming direction and accessories should be reviewed to ensure glare minimisation
- Mounting brackets should be appropriately sized
- RAL finish to match the finish of the architecture if mounted onto a facade or monument base.

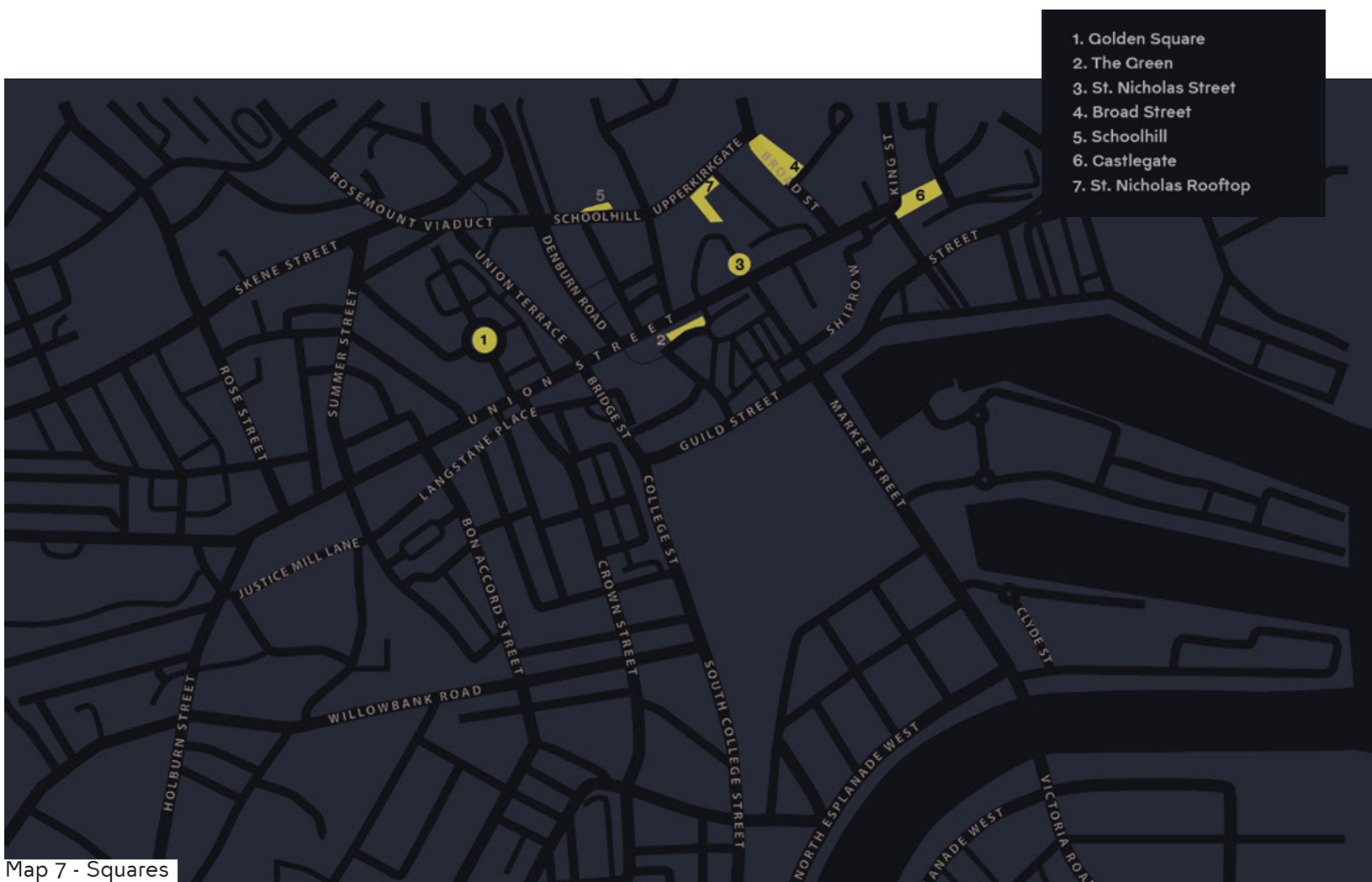
Floor recessed spot:
- Ensure spot is adjustable for commissioning
- Ensure suitable housing from reliable and proven manufacturer
- Ensure walk/drive over dependent on project requirements
- Allow for anti slip cover where accessible
- Ensure adequate drainage.

All of the above types of fixtures would have to comply with the following:
- Driver housing and location needs to be taken into consideration.
- Luminaires require to be appropriately IP and IK rated
- Lighting Colour Temperature: 2700-3500K
- Minimum CRI: RA 85.



Lighting elements	Quantitative measures	Quality measures	Considerations
Functional pole top lighting.	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85	Poles can be used to mount feature or projection lighting as well.
Standalone solar panels	N/A	N/A	Location of solar panels need to be reviewed for the optimal sun positions. Solar panels to be integrated within the post tops and not on top

Creative lighting considerations for squares.



Map 7 - Squares

3.4.6 Waterfronts

Aberdeen has a varied waterfront including rivers, harbours and beaches, where the city centre verges onto two important waterfronts consisting of the River Dee and harbour.

The objectives are:
- To promote the southern connection to the city centre.
- To emphasise the unique waterfront assets.
- To create a night time activation area along the River Dee.
- To provide visual guidance from the ferry terminal to the city centre.
- To reconnect the city to the historic waterfront.

Design approach for creative lighting

Creative lighting is introduced in different ways to address waterfronts, where the treatments are split into the following:
- Riverfront walk
- Harbourside walk
- Southern connection

Riverfront walk
The riverfront should be illuminated to promote pedestrian circulation night time activity with benches to sit and relax. Uplighting to the trees along the river front will provide a visible guidance along the pedestrian path and provide visual brightness for comfort and safety.

As both north and south banks of the river between Victoria and Queen Elizabeth II bridge are proposed to be illuminated a visual connection is made across the water linking the two spaces. This is encouraged with the riversbank project in chapter 3.5 that promotes both the riverfront walk lighting and captures an art installation on the south bank.

Luminaire requirements:
- Ensure suitable housing from reliable and proven manufacturer.
- Ensure housing is walk over.
- Allow for anti slip treatment to glass top.
- Luminaires require to be IP65 rated.
- Marine grade steel used in the housing.
- Lighting Colour Temperature: 2700-3500K
- Minimum CRI: RA 85.
- Visibility of sources and glare to be avoided, ensuring views across the river

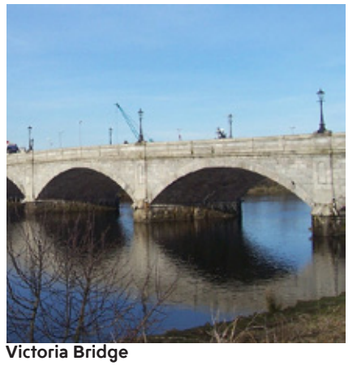

North river bank


South river bank

Harbour walk


Harbour Board Offices


Wellington Bridge

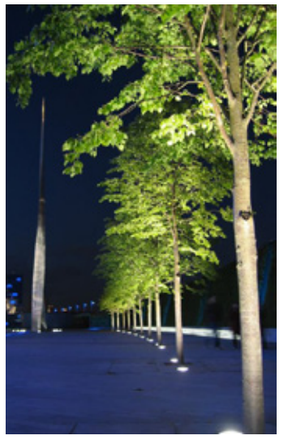

Victoria Bridge

Harbourside walk

The harbourside could be illuminated to provide a visual guidance for the pedestrians arriving at the ferry terminal and to promote a pedestrian connection from the riverside to the city centre using human scale lighting to create an overall and consistent experience. Lighting should allow for experiencing the harbour at night time in a safe and guided way, whilst allowing views along the port from the historic centre to the water. Considerations should be given to the use of low level pedestrian or furniture lighting to mark boundaries whilst maintaining vistas.

Luminaire requirements:

- Lighting Colour Temperature: 2700-3500K (colour treatments dependent on project and council approval).
- Luminaire Type: various, pending application.
- Minimum CRI: RA85
- Distribution: mainly soft and diffused, pending application.
- No visible light sources unless diffused marker lights.
- Marine grade steel housing required and consideration to salt water environment.
- Luminaires require to be IP65 rated.



Southern Connection

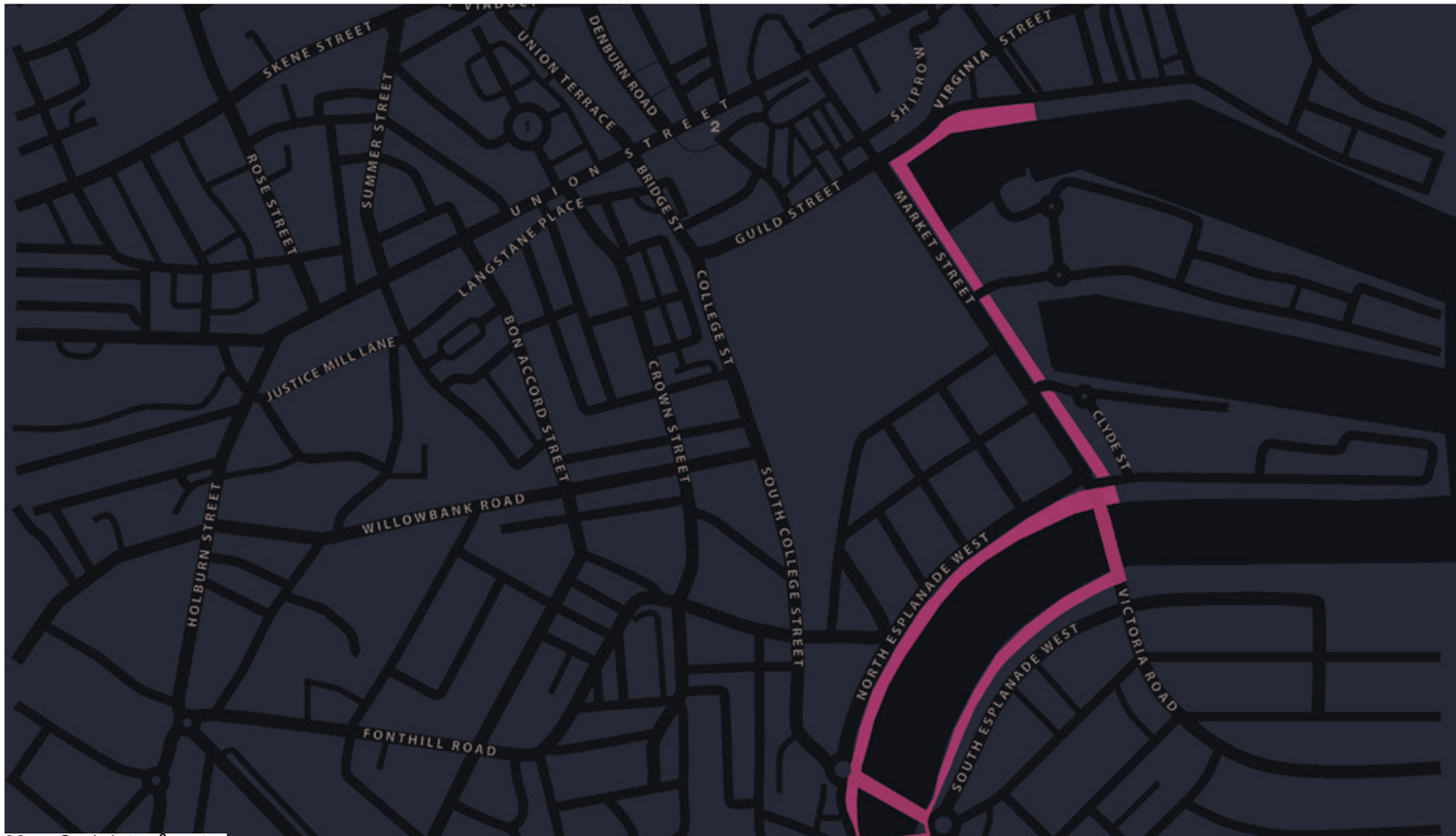
The main vistas approaching the city centre from the south include the Victoria Bridge, Queen Elizabeth Bridge and Wellington Suspension Bridge, providing visual connections for the main public transport, vehicular and pedestrian routes into the city centre from the south. It provides Aberdeen with a welcoming visual intrigue to the city centre and communicates the extent of the city centre to the arriving visitors connecting the waterfront areas.

Light treatment to the bridges as indicated in the Wellington and Victoria bridges project in chapter 3.5 shows how the vista can be transformed.

Luminaire requirements:

- Lighting Colour Temperature: Various including subtle colour treatments.
- Luminaire Type: various, project dependent.
- Minimum CRI: RA85
- Distribution: various, project dependent.
- No visible light sources unless diffused marker lights.
- Marine grade steel housing required.
- Luminaires require to be minimum IP65 rated.

All waterfront installations need to consider and minimise impact on fish and their migration behaviour.



Map 8 - Waterfronts

3.4.7 Landscape areas

Parks provide an important function within the city. They mostly require an individual creative lighting strategy. Currently a project is already underway to transform Union Terrace Gardens (see section 2.2) that corresponds to the lighting guidelines for landscape areas.

Design approach for creative lighting

A varied lighting approach can be applied, resulting in a more comfortable user environment. A creative lighting scheme for a park should consider the following elements:

- Main park entries
- Park perimeter
- Main pedestrian and cycle through pathways and path surrounds
- Selected landscaped areas i.e. trees
- Furniture
- Public art (where applicable)
- Architectural elements and structures (where applicable)

The riverbanks project in chapter 3.5 is an example of introducing the use of an art installation along the south side of the River Dee to provide visual intrigue from close proximity and from across the river allowing the two spaces on either side of the river to connect.

The size, location, circulation patterns / access and use of city's parks will determine the creative lighting design that would consider the following:

- The visibility the pedestrian has of the surrounding environment.
- Extend park lighting off the main pathway, providing greater visual depth and comfort.
- Reduce glare sources.
- Investigate the application of additional lighting applications such as tree lighting and integrated furniture lighting which can contribute to the overall pedestrian experience and perception of safety.
- Provide sufficient light to the main park pathways and the park perimeter to aid in navigation and wayfinding.

Luminaire requirements:

- Lighting Colour Temperature: 3000K to 4000K (where 4000K is only used to enhance particular fauna)
- Luminaire Type: various, pending application.
- Pole Height: 4-4.5m
- Minimum CRI: RA85


River Dee


Union Terrace Gardens


Bon Accord Square


River Dee North Bank


River Dee South bank

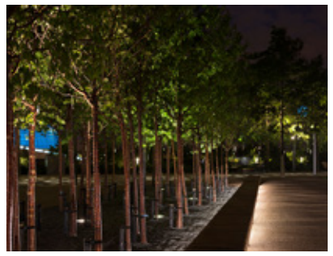

Bon Accord Terrace Gardens

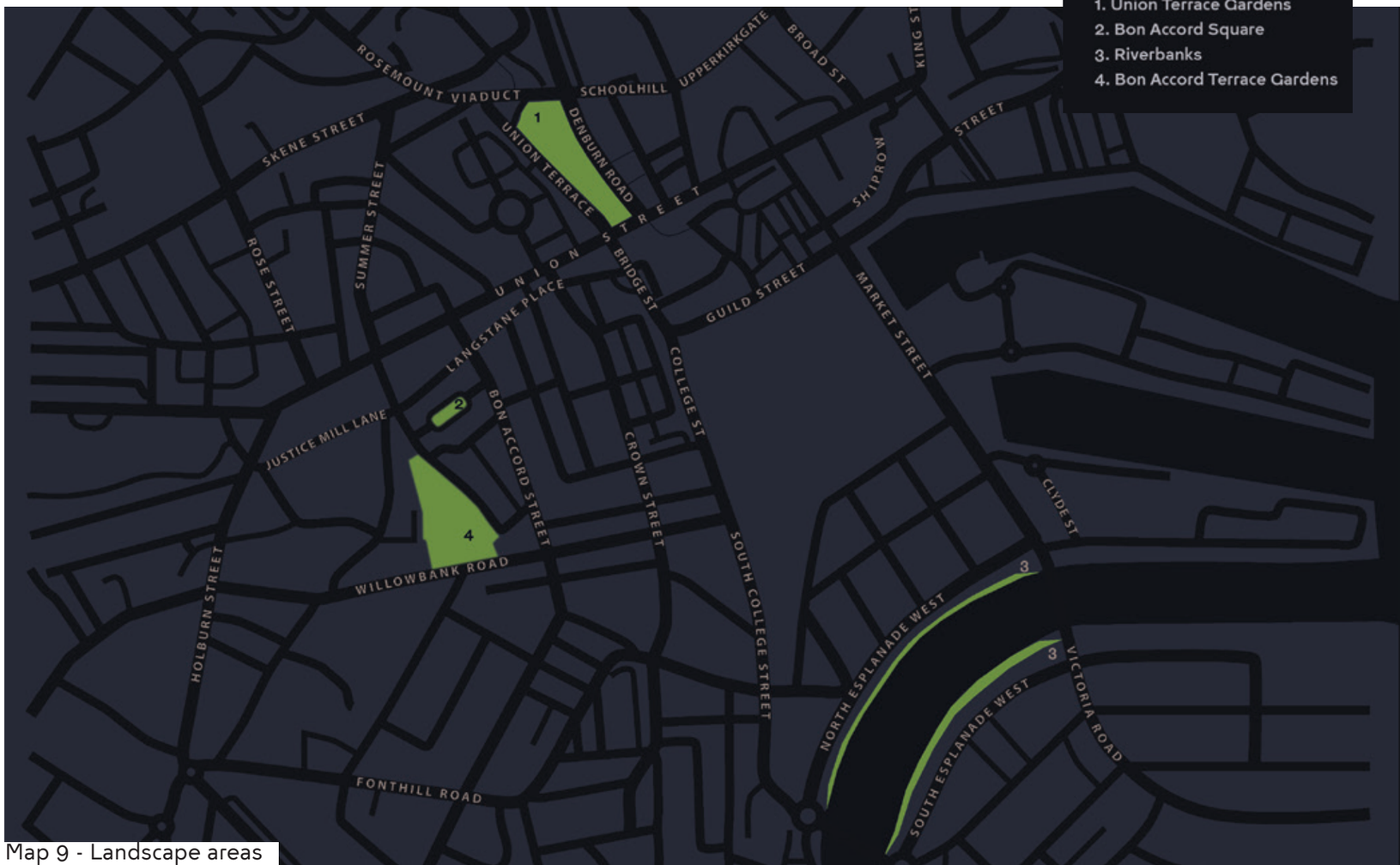
- Distribution: various, pending application.
- Light shall extend into the surrounding areas, including perimeter and landscape surrounds (trees, bushes etc.) to increase perception of brightness and safety.
- Flood-lit spaces with uniform brightness across the entire park are not considered appropriate.

Other notes: Materials shall be stainless steel, galvanised steel or anodised aluminium with Corrosion Resistant Finish. Both shadow and light shall be utilised to distinguish the park from the general streetscape and to provide direction and focus at night time.

Lighting elements	Quantitative measures	Quality measures	Considerations
Functional lighting.	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85	Functional lighting can be achieved in different manners and will be project specific.

Creative lighting considerations for landscape areas.





Map 9 - Landscape areas

3.4.8 Façades and Monuments

The rich Aberdeen architectural and sculptural legacy celebrating the city's and Scotland's past is ingrained in its identity. The granite townscape gives the city a distinctive signature. Dotted around the city are a number of architecturally unique buildings. Domes and spires form the distinct Aberdeen skyline.

Currently there are projects already underway to support the development of facade lighting throughout significant heritage buildings in the city centre. These include Aberdeen Art Gallery, Marischal College and the Music Hall.

The following domes and spires should be given due consideration as key to the skyline of the city:

Domes:
- Central Library
- St. Mark's Church,
- His Majesty's theatre
- Cowdray Hall
- Former Aberdeen Academy

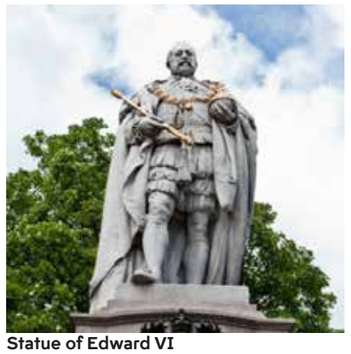
Spires:
- Kirk of St Nicholas
- Triple Kirks
- St. Mary's Cathedral
- Gilcomston South Church

The main objectives are:
- To portray Aberdeen's architectural heritage at night, considering the street vistas and the skyline views.
- To improve the legibility of the city and the amenity at night time.
- To promote the activation and movement of visitors through the city whilst being sensitive to the reduction of light pollution and energy consumption.

Design Approach for creative lighting

As part of the Creative lighting strategy key façades and monuments are highlighted on map 9 to identify significant buildings and their pattern in location. A select few as highlighted above have been identified to be illuminated based on their historical, architectural or


Dome of St. Mark's Church


Statue of Edward VI


Triple Kirk


Gilcomston South Church

Central Library


St. Mark's Church


War memorial/ Cowdry Hall

His Majesty's Theatre


Former Aberdeen Academy

cultural value as well as the building context.

Creative lighting should be subtle, highlighting specific features only. Floodlighting entire façades or over illumination for business purposes is not supported. Lighting on general commercial building shall have a ‘low key ‘approach so as not to compete with the identified landmark buildings.

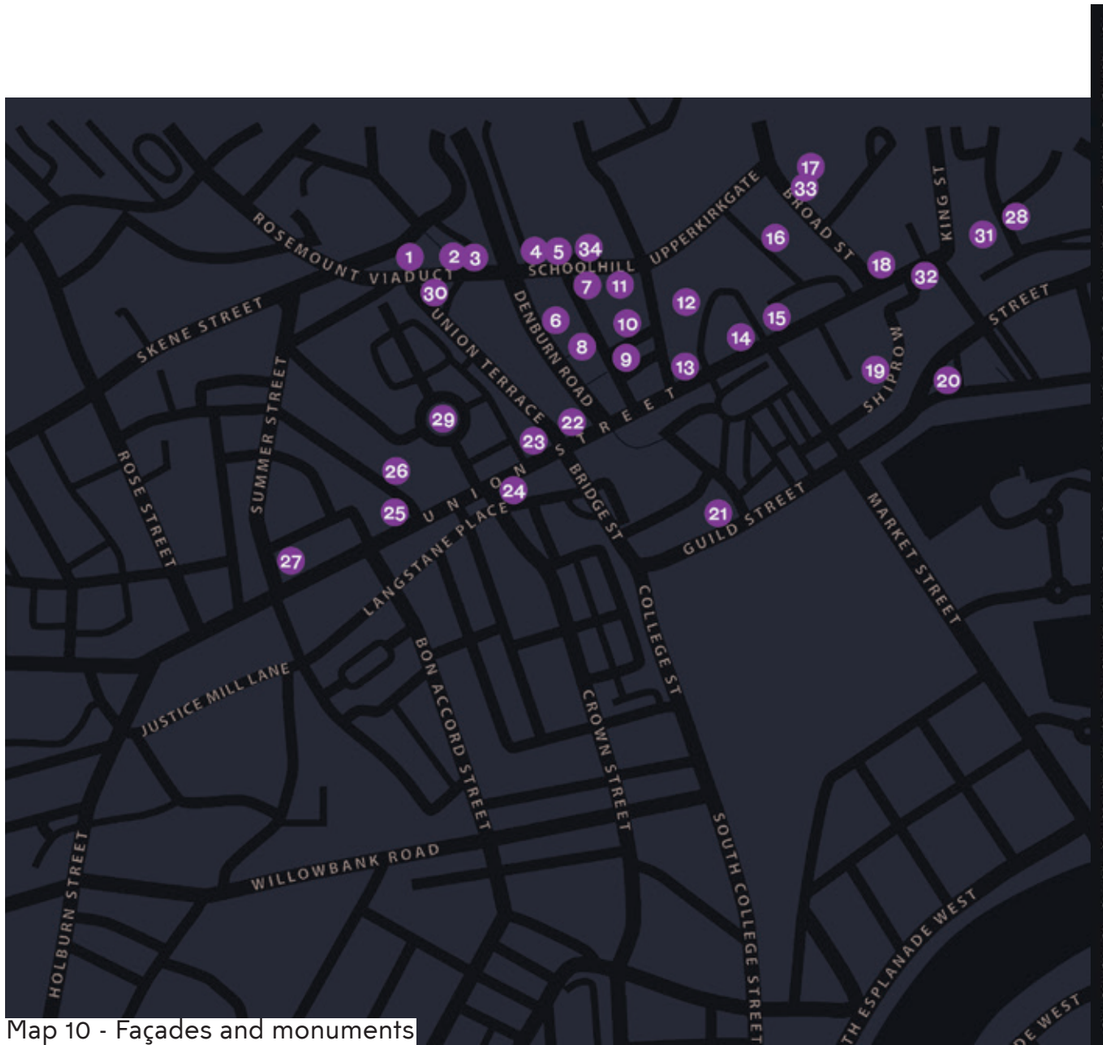
Dark recesses in building façades affect the perception of safety within the streetscape of the public domain. Adequate lighting should be provided to these areas as an integrated part of a building façade lighting scheme.

Lighting equipment shall be integrated in the architecture of the building where possible with the daytime appearance of the luminaires not being visually imposing. The conservation status of the building shall be checked and addressed. Consultation with heritage officers of Aberdeen City Council should be sought and conservation planning policy requirements adhered to.

Location should also be chosen so as to avoid source visibility and glare and to minimise spill light. Facade lighting can be partially integrated into street lighting where applicable.

Luminaire requirements:

- Light Source: LED
- Colour Temperature: 2700K – 3000K to create sense or warmth and ambience. CCT should be tested in mock-up on the actual facade/ stone.
- Minimum CRI Façade Lighting: RA80
- Minimum IP rating: Is dependent on the mounting location but should be no less than IP54, generally when exposed to the weather IP65.
- Installation: External lighting fixtures are to be integrated with the architecture of the building where possible and the daytime appearance of the luminaires is not to be visually imposing. Collaboration with heritage consultant and on-site mock-ups are recommended.



Map 10 - Façades and monuments

1. Central Library, Rosemount Viaduct
2. Aberdeen’s St. Mark Church, Rosemount Viaduct
3. His Majesty’s Theatre, Rosemount Viaduct
4. Aberdeen City War Memorial/ Cowdry Hall, Schoolhill
5. Art Gallery, Schoolhill
6. The Triple Kirks, Schoolhill
7. Former Aberdeen Academy, Schoolhill & Belmont Street
8. Former Church, Belmont Street
9. Kirk House, Belmont Street
10. Town School, Little Belmont Street
11. James Dun’s House, Schoolhill
12. The Kirk of St. Nicholas, Union Street
13. St. Nicholas Churchyard and Screen, Union Street
14. Royal Bank of Scotland, 78 Union Street
15. Clydesdale Bank, 62 Union Street
16. Provost Skene‘s House, Guestrow
17. Marischal College and Greyfriars Church, Broad Street
18. Town House, Broad Street & Union Street
19. Provost Ross’ House, Shiprow
20. Aberdeen Harbour Board, 16 Regent Quay
21. Station Hotel, Guild Street
22. Edward VI Statue, Union Terrace & Union Street
23. Commercial Union, 1 Union Terrace
24. Bank Of Scotland, 201 Union Street
25. Paul & Williamsons, 214 Union Street
26. St. Mary’s Cathedral, Huntly Street
27. Gilcomston South Church, Union Street
28. Citadel, Castle street & Justice street
29. Duke of Gordon, Golden Square
30. William Wallace, Rosemount Viaduct
31. Mercat Cross, Castlegate
32. The Mannie, Castle Street
33. Robert The Bruce, Broad Street
34. Charles George Gordon, Broad Street

3.4.9 Laneways

The heart of Aberdeen is characterised by narrow, low traffic streets, some dating back to medieval times. Granite road and footpath surfaces are one of the features of this typology. In some of these laneways mostly situated to the south of Union street, desired activation is low while in others it is high.

The main objectives are:

- To focus on pedestrian amenity, making laneways a destination.
- To attract visitors at night and encourage activity.
- To create a sense of identity.
- To increase the perception of safety through passive surveillance for residents and visitors.
- To support wayfinding and connection

Design Approach for creative lighting

Laneway lighting should be appropriate for human scale and activity and should respond to the unique character and scale of each laneway.

The lighting strategy proposes the use of wall mounted lanterns, pedestrian height small poles and catenary installations. Luminaires shall be contemporary in style but create the same warm ambiance of the traditional lanterns. Vertical feature urban texture such as murals or cultural wayfinding points could be highlighted, whilst avoiding unwanted obtrusive light to the neighbouring residential properties.

A consistent luminaire throughout this typology will demonstrate consistency and legibility within the typology and aid wayfinding in the city. The unique identity of each laneway can be translated into lighting design by having a different colour to the internal face of the lanterns cap, which won't dominate its appearance but provide intrigue during the day and have a soft glow at night. The approach sits in line with the colour strategy within the primary routes linking back to the greater scheme of the city centre.

The lighting levels shall be adequate to provide a sense of comfort and safety and promote the use of the laneways as pedestrian and cycling routes. Signage throughout the laneways should be illuminated sufficiently for wayfinding without dominating the overall lighting levels.

Areas that contain commercial night time activity should have increased light levels during

Adelphi Lane


East Green


Mc Combie's Court

Bath Street


Shiprow Lane


St. Nicholas Lane

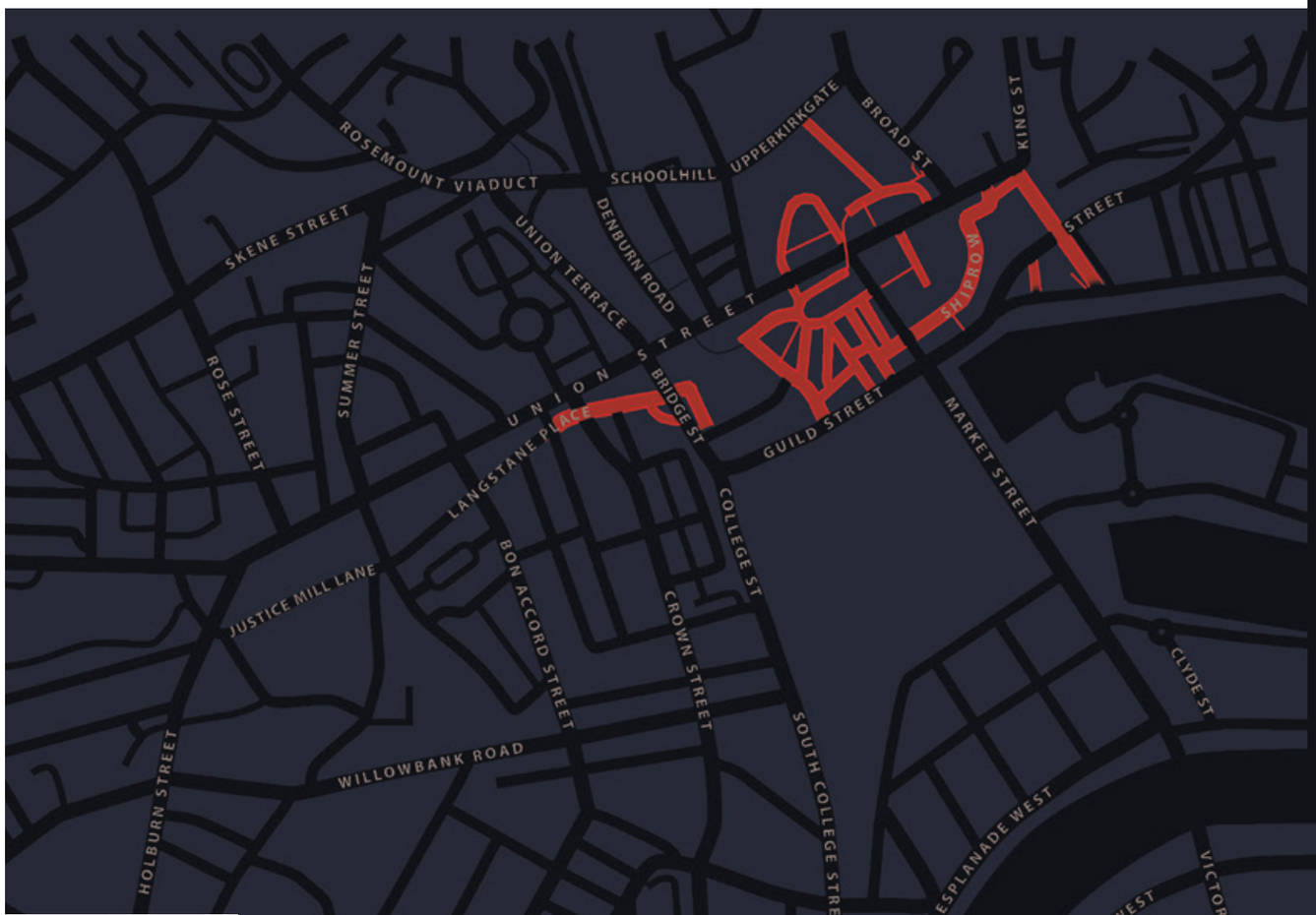
the active hours before curfew to ensure adequate lighting is allowed for their use.

Luminaire requirements:

- Light Source: LED
- Colour Temperature: 2700K – 3000K. Use of colour or cooler colour temperatures could be included for murals or art installations, project dependent, pending approval.
- Minimum CRI: RA85
- Minimum IP rating: Is dependent on the mounting location but should be no less than IP54, generally when exposed to the weather IP65.
- Installation: Enhancement lighting fixtures are to be integrated with the architecture of the building where possible and the daytime appearance of the luminaires is not to be visually imposing.

Lighting elements	Quantitative measures	Quality measures	Considerations
Wall mounted contemporary lanterns, pedestrian height small poles of similar style, catenary installations and signage lighting	Per BS EN 13201-2: 2015 and BS 5489-1:2013	2700 - 3500K Min RA 85	Signage lighting is to be focused directly on to the sign without creation of glare or spill light.

Creative lighting considerations for laneways



Map 11 - Laneways

3.5 Creative lighting projects

This chapter describes twelve creative lighting catalyst projects, representing each of the eight typologies in section 3.4. They introduce the lighting strategy in Aberdeen City Centre. The selection was informed by the stakeholder engagement and discussions with the City Council and include key areas identified that had a potential for people to pause or to stay.

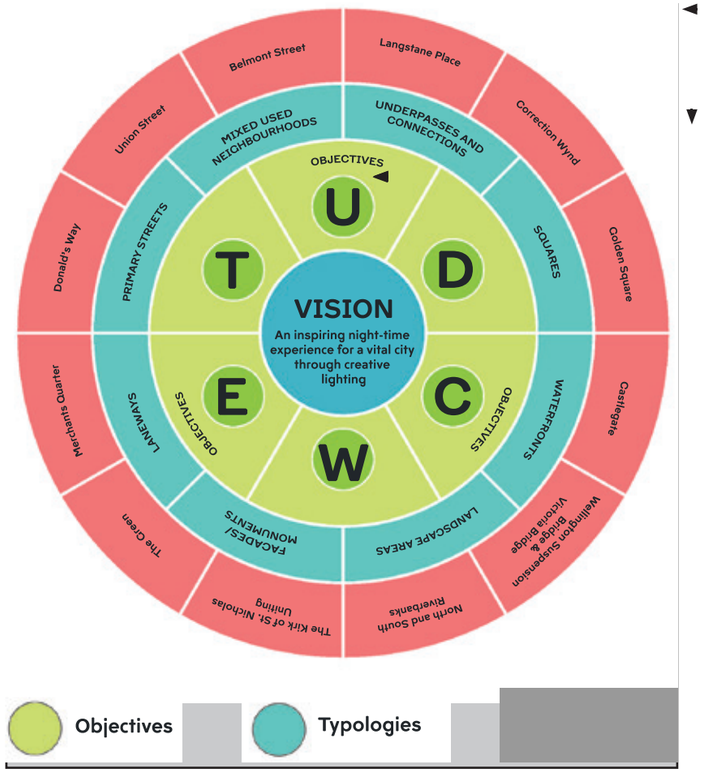
Apart from aesthetic appeal, visual coherence, enhancement of safety and comfort these proposals amplify the vibrancy and contribute to an engaging and memorable night-time journey that expresses the unique identity and characteristic of Aberdeen City Centre.

These projects intend to encourage locals and visitors to linger and gather; to pause during their journey due to engaging and dynamic lighting intervention. They also play a role in wayfinding and orientation by creating landmarks at street and skyline level.

Each of these projects delivers on four or more of the six driving objectives. These are identified for each project. Sections 3.5.1 to 3.5.12 below describe the following projects: Union Street, Belmont Street, Langstane Place, Correction Wynd, Golden Square, Castlegate, Wellington and Victoria Bridges, Riverbanks, The Kirk of St. Nicholas, The Green, Adelphi Lane, Donald's Way.

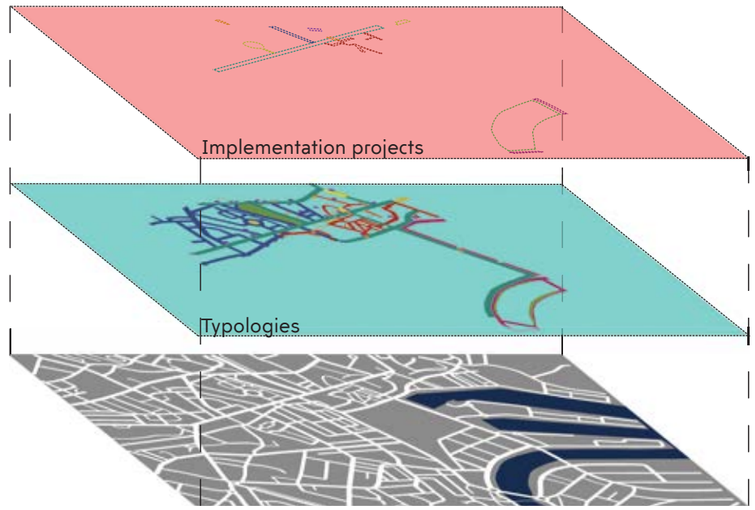
The design of the creative lighting projects should have regard to the urban realm opportunities revealed in the CCMP. Some project locations such as Belmont Street already offer the high quality urban realm and lighting will enhance the role of the area in the city. Other projects such as the Riverside provide prospects for urban realm interventions and developments, in addition (or following) the lighitng proposals.

Union Street is proposed as a pedestrian friendly street that reinforces its role as Aberdeen's major spine and connector.



◄ **Complete Creative Lighting Strategy Framework Diagram** - 12 projects from 8 typologies designed to achieve the creative lighting strategy objectives which are based on the Vision for Aberdeen City Centre.

▼ The Creative Lighting Strategy is a two layer approach. Guidelines for the entire city centre, ensuring coherence are provided through the typologies section. They set the standard for the base layer of exterior lighting within the city centre through creative lighting projects. The implementation projects spread over the city centre and representing all the typologies present high impact projects; a creative intervention layer.



Belmont Street already offers high quality urban realm improvements that have encouraged street markets, pavement life and a vibrant independent retail and business offer. The proposed lighting interventions enhance the street's role in the city.

Langstane Place is planned to offer restricted vehicular movement to prioritise pedestrians and cyclists. The street is seen as a key area for evening economy activities through enhanced pedestrian priority complimented by new cycle routes, improved streetscape and lighting.

Correction Wynd offers the possibilities responding to its historic character. The streets historic role within the city should be revealed through lighting improvements and historic interpretation to encourage greater use of the street.

Golden Square should be re-imagined from a vehicle-dominated car park to a public square and events space associated with the Music Hall. Redesign of Golden Square to accommodate a more pedestrian friendly space can also coincide with the redefinition of South Silver Street as a pedestrian priority zone whilst retaining servicing and access arrangements. Cycle hubs, charging points and a performance space are just some of the interventions considered in the new public space. The public realm works on Golden Square

will greatly improve the spaces' role.

Castlegate should be presented as the 'Central Civic Space' for Aberdeen that responds to the rich architecture and strong urban structure. Ground floor active uses, alfresco dining and markets should ensure a vibrant buzz within the people friendly space. The design approach should be minimalist and defined, adding clarity to the geometry of the space with high quality natural stone materials and lighting. Castlegate should be made event –ready, capable of hosting a range of events and entertainments that will provide a much-needed sense of vibrancy and animation.

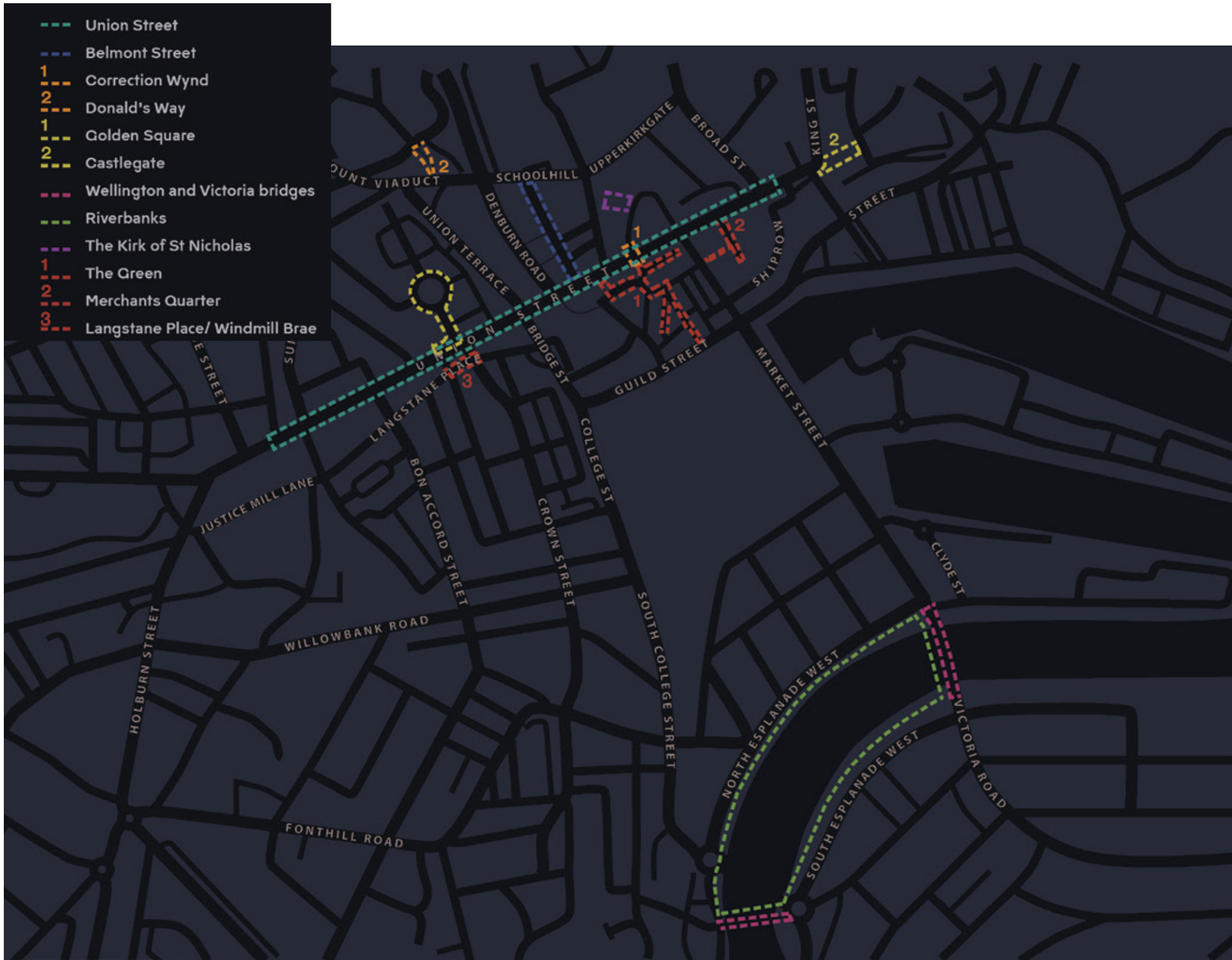
Wellington and Victoria Bridges should offer adequate pedestrian footpaths that promote walkability and the connection between the Torry Waterfront and the city centre. The riverbanks located along Torry Waterfront propose an enhanced riverside promenade and a new parkland environment abound by residential apartments, hotels and ground floor active uses. Adequate seating, lighting and other amenities should be introduced along the promenade encouraging the river as a city destination. Environmental initiatives should also be introduced along the river edge to improvement water quality and the ecological condition of the river.

The CCMP highlights the historic importance of the Kirk of St Nicholas Uniting. Lighting improvements are the major opportunity for this significant city centre landmark.

The Green's historic location is identified as a significant opportunity to introduce a mix of uses including retail that enhance the overall vibrancy and attractiveness of the area and other uses such as residential.

The Adelphi Lane Quarter's street art should be continued to compliment the lighting improvements planned in the laneway. Increased ground floor activation along the laneway offers the potential to increase pedestrian footfall and better integrate the lane with Union Street.

Donald's Way should offer improved public realm treatments that relate to the city's granite architecture. By maintaining a simple aesthetic in keeping with the historic character of the lane.



Map 12 - Projects

3.5.1 Union Street

Artist impression of Union Street East project, normal mode


Artist impression of Union Street East project, event mode


Artist impression of Union Street West project


Artist impression of Union Street East project, event mode

"Union Street has been the beating heart of Aberdeen for generations"

- ACC Councillor Jenny Laing

Union Street, approximately 0.8miles long, running East to West supported by a viaduct of arches above the medieval town, was built in the 19th Century. It takes its name from the 1800 Acts of Union between the UK and Ireland. It is a main city centre destination. The section between Castlegate and Holborn junction is also referred to as The Granite Mile. There are plans in the current City Centre Masterplan to exclude car borne traffic from the East part of Union Street between Castlegate and S Silver Street. Union street is within a conservation area.

Objectives

The main project objectives are to:

- Establish at night time the presence equivalent to Union street during the day.
- Provide pedestrian focus while maintaining vehicular friendly lighting.
- Improve the night time economy.

Design Approach

The lighting strategy makes Union Street unique emphasising its identity and strategic position at the heart of the city centre. It provides for events generating an activated and fun atmosphere. Lighting is moved from the building façades to the centre of the street reducing obtrusive light to buildings. The combination of Christmas lighting with this scheme should not be hindered or discouraged. The section of Union Street between Market Street and Broad Street was identified for the first phase or catalyst project.

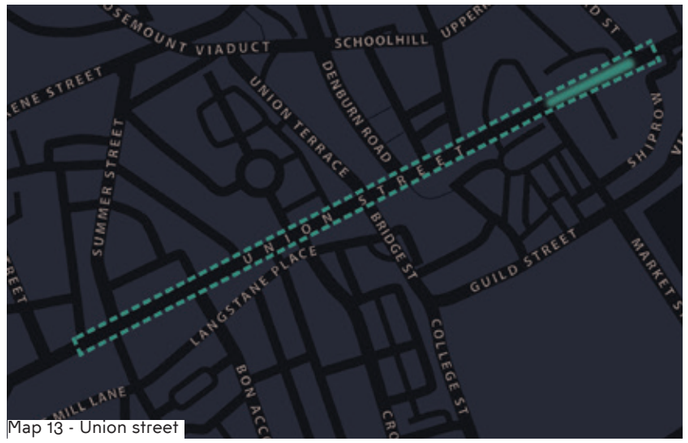
Lighting Elements

Key elements of the scheme are:

- Facade lighting of buildings of architectural interest namely Clydesdale Bank 60-62 Union Street, 39-41 Union Street and 32-38 Union Street, highlighting the most pleasing features making for a coherent backdrop.
- 'Spill' light from shopfronts
- Circular shape Union street specific catenary luminaire system along the entire central axis of union street symbolic of its function as a connector within the city.
- For Union Street west only, additional catenary pendant luminaires to both sides of the street that can be turned on and off in a sequence and that can change colour, giving the possibility of moving fun dynamic patterns.

Lighting System Requirements

The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.2. Each of the lighting elements should have a consistent lit appearance providing clarity and a hierarchy along the street. Warm white light (3000K - 3500K) shall be used for the façades and shop fronts with a cooler colour temperature for the street lighting (3500-4000K). Catenary pedestrian lights above the pavements



Map 13 - Union street

Entire Union street project extent outline and catalyst project shown shaded


60-62 Union Street


32-38 Union Street


39-41 Union Street

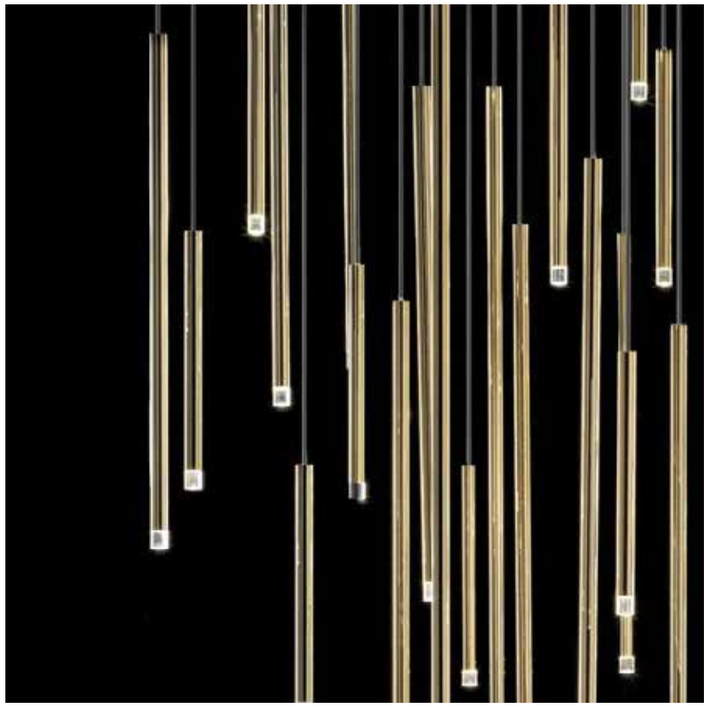
shall have a warm colour temperature (2700 - 3300K). Current luminaire supports and infrastructure shall be utilised for heritage conservation and economic purposes. As part of the entire street project pole supports may be required in areas of the street where there are no buildings to attach to. Facade lighting equipment shall be kept as discreet as possible and any damage to listed buildings avoided.

Control

The control system shall allow flexibility and dynamic effects to pedestrian lighting for selected weekend times and events. Light sensors shall be used to turn all the lights on at dusk and central catenary lights off at dawn thus taking account of annual daylight changes. Facade lighting should be turned off automatically meeting curfew recommendations. Consideration shall be given to turn-off shop front lighting after a time to be agreed with Aberdeen City Council.

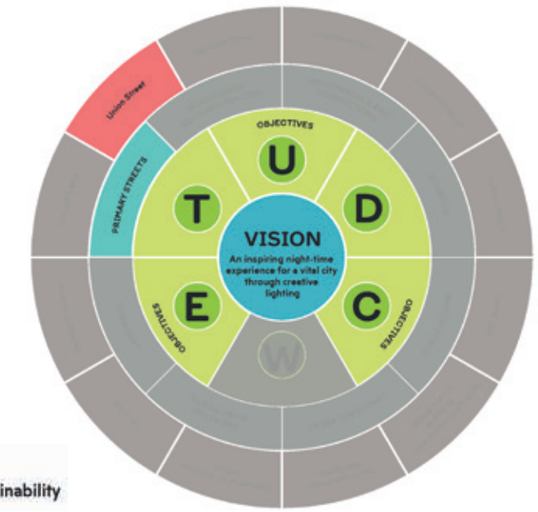
Shopfront lighting

It is recommended that the City Council shop front guidelines are extended to include lighting guidelines.



The Union Street project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.2 Belmont Street

Belmont Street runs north to south between Schoolhill and Union Street. It dates back to the 18th Century when the town was expanded. The current street frontages include three church buildings and 18th Century houses that still survive. Belmont Street frames part of the Art Gallery facade situated on Schoolhill and is within a conservation area.

Objectives

The main project objectives are to:

- Create a pedestrian friendly pleasant atmosphere increasing the sense of safety
- Improve the night time economy
- Provide a visual connection between Union Street and Schoolhill, framing a view of the Art Gallery as the focal point on approach from Union Street
- Provide a consistent appearance along the street

Design Approach

The lighting strategy showcases the character of this street and provides a consistent appearance along the street allowing visual continuity that directs the eye, aiding wayfinding. The scheme provides for events, instilling curiosity and change over time, generating interest.

Lighting Elements

Key elements of the scheme are:

- Facade lighting of buildings of architectural interest namely 8-12 Belmont Street, Kirk House, Former Church 33 Belmont Street, Former Aberdeen Academy on the corner of Belmont Street with Schoolhill and Triple Kirks, highlighting the most pleasing features making for a coherent backdrop.
- 'Spill' light from shopfronts
- Consistent illuminated projecting shop signs at current mounting locations
- Elegant catenary lighting system

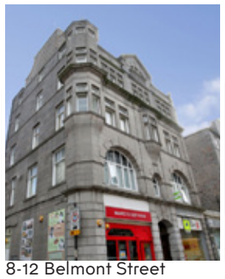
Artist impression of Belmont Street project

Artist impression of Belmont Street project, event mode


Artist impression of Belmont Street project, event mode


Aberdeen Art Gallery proposal


Former church
33 Belmont Street


8-12 Belmont Street


Triple Kirks

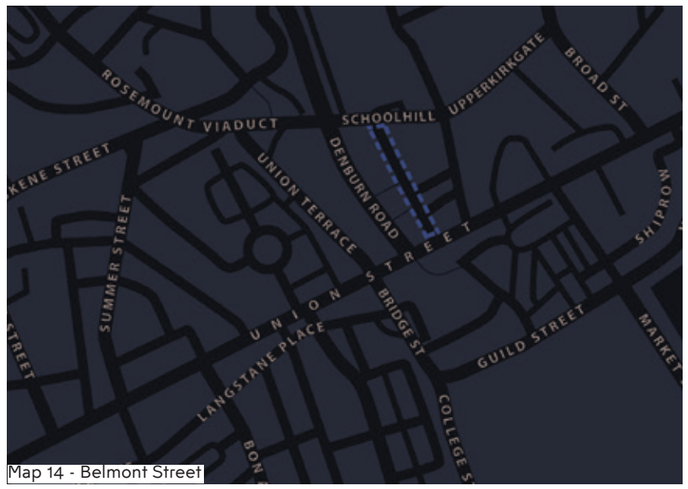

Former Aberdeen Academy`


Kirk House

Lighting system requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.3. Each of the lighting elements should have a consistent lit appearance providing clarity and a hierarchy along the street. Warm white light (3000K to 3500K) shall be used for the façades and shopfronts with a cooler colour temperature for the street lighting (3500-4000K). Current lighting fixing positions and infrastructure shall be used where possible. Excluding event mode, the projecting shop signage shall be warm white (2700K). As part of the signage design, reference shall be made to the shopfront guidelines.

Control
Light sensors shall be used to turn all lights on at dusk and catenary lighting off at dawn, thus taking account of annual daylight changes. Facade lighting should be turned off automatically meeting curfew guidelines. Consideration shall be given to turn-off shop front lighting automatically after a time to be agreed with Aberdeen City Council.

The control system shall allow for colour change of the projecting shop signage lighting for events and commemorative days. Modification of the light output in the range between 70% and 100% shall also be facilitated enabling street light levels to be used as part of anti-social behaviour control measures.

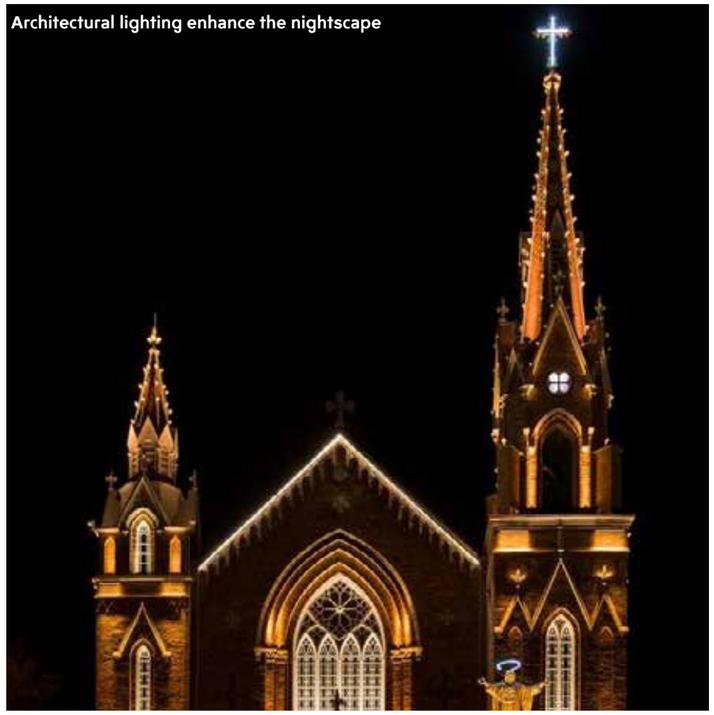


Map 14 - Belmont Street

Carefully selected catenary lighting create visual interest

Consistent signage contributes to creating a visual connection towards a focal point

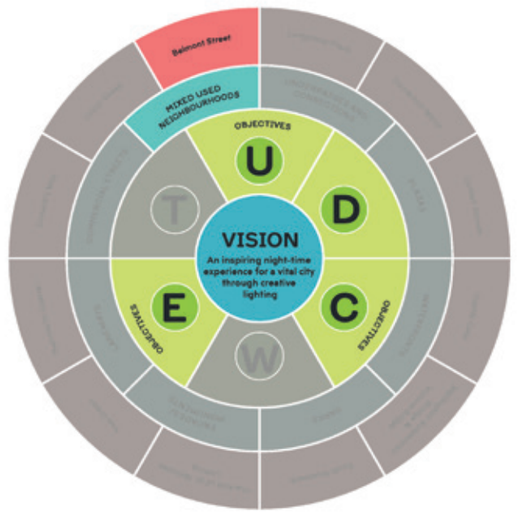
Catenary lighting help declutter urban streets



Architectural lighting enhance the nightscape

The Belmont Street project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy



3.5.3 Langstane Place

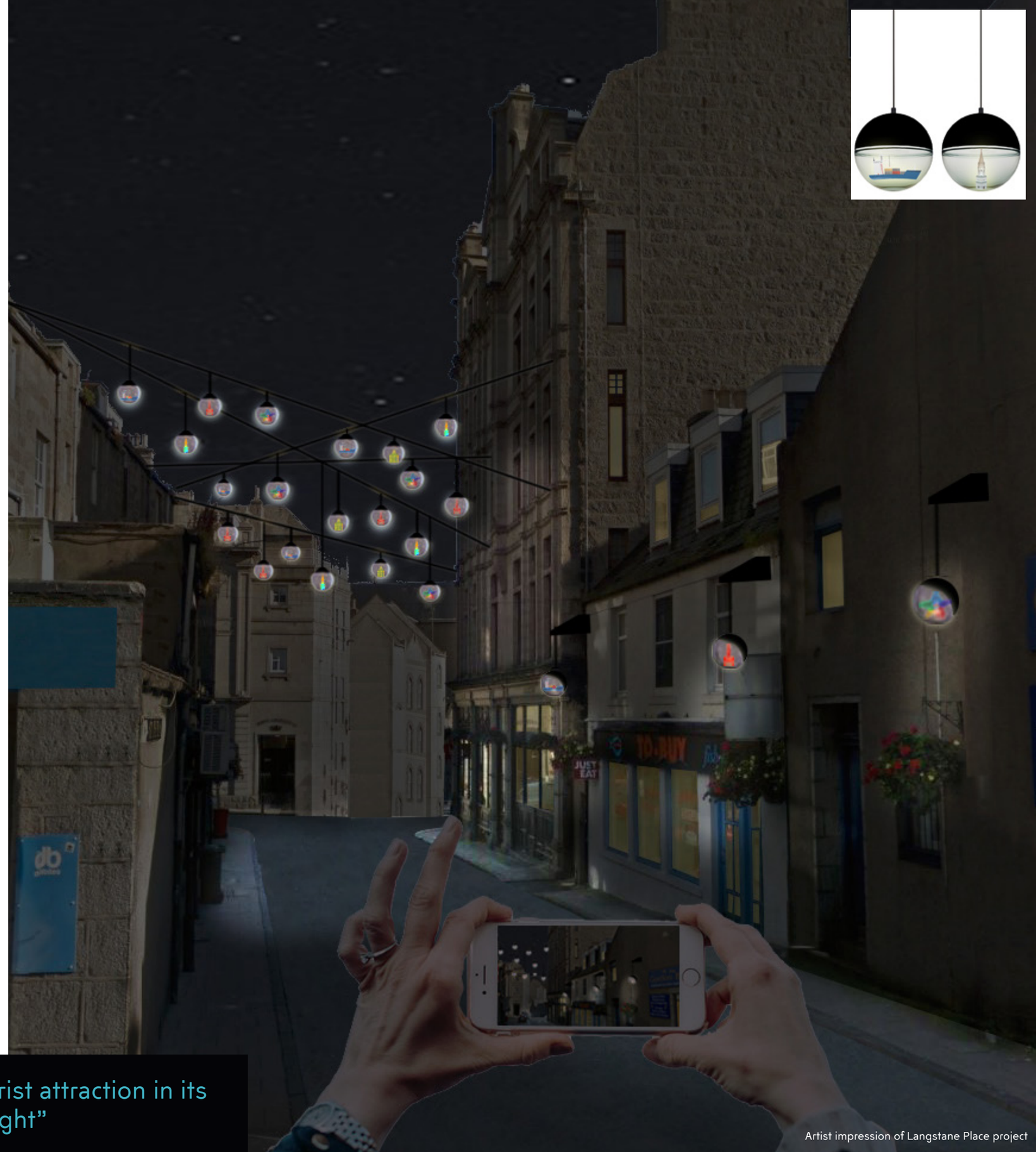
Langstane Place, a narrow street to the south of Union Street takes its name after the Lang Stane, a granite menhir type stone. The surrounding buildings include residential, small shops, restaurant and pubs. Langstane Place is part of the Bon Accord/ Crown Street and Union Street Conservation areas. There are plans to make a short section of this street traffic free, raising potential for bars and cafés to extend onto the street creating vibrancy.

Objectives
The main project objectives are to:
- Support the change from vehicular to pedestrian
- Create a landmark place
- Encourage community engagement and a scheme that the users can relate to
- Provide continued interest, encouraging people to return

Design approach
Customised luminaires on a catenary system, with periodically changing appearance, designed with input from various local groups, create a focal point overhead that is reflective of local culture. The installation projects a warm ambiance and a festive feel suited for an area where people gather at night. Wall mounted luminaires provide lighting throughout the rest of the street.

Lighting elements
Key elements of the scheme are:
- Suspended luminaires on a catenary system, including Aberdeen art designed in conjunction with the community. The art within the luminaires can be changed periodically.
- Wall mounted luminaires in keeping with the catenary system lighting.

Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.9. Light pollution

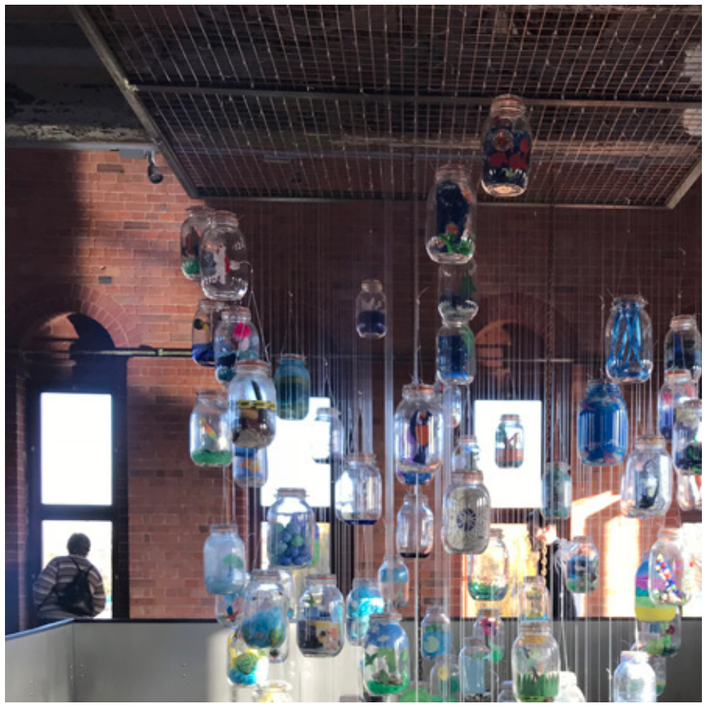


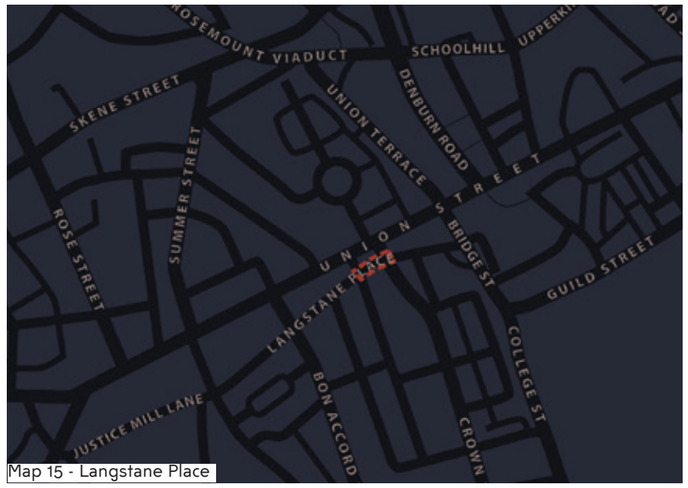
"A tourist attraction in its own right"

Artist impression of Langstane Place project

and obtrusive light to residential buildings shall be avoided. The luminaires shall allow for the replacement of the artwork without affecting ingress protection. The integrity of the buildings shall be respected and attachment points minimised, to avoid damage to historic buildings.

Controls
Light sensors shall be used to turn the lights on at dusk and off at dawn, thus taking account of annual daylight changes.

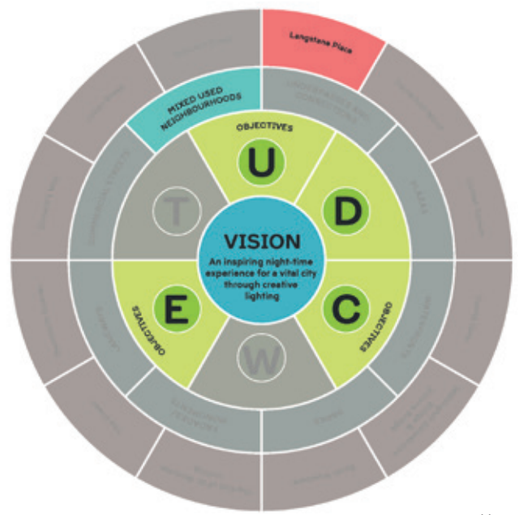




Map 15 - Langstane Place

The langstane place project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy



3.5.4 Correction Wynd

The Correction Wynd or ‘winding street’ takes its name from the House of Correction which stood on the street between the 1637 and the 1711, providing lodging and employment in the cloth trade. The Wynd connects the Green to the grounds of Mither Kirk and transverses Union street. Stairs to the side of the underpass lead to Union street. The Wynd underpass frames the Spire of the Kirk of St. Nicholas when viewed from The Green. Correction Wynd is within the Union Street conservation area and the bridge is a listed structure.

Objectives
The main project objectives are to:

- Enhance the character of the street and focus on pedestrian scale
- Improve the feeling of safety
- Provide a visual connection between Union Street, The Green and The Kirk of St. Nicholas

Design Approach
The lighting strategy follows the architecture, highlighting form and materiality. Light visually connects areas at different levels aiding navigation and wayfinding. Use of contrasting but complementary colours assist visual clarity in the composition. Lighting control is used to introduce dynamism and encourage engagement.

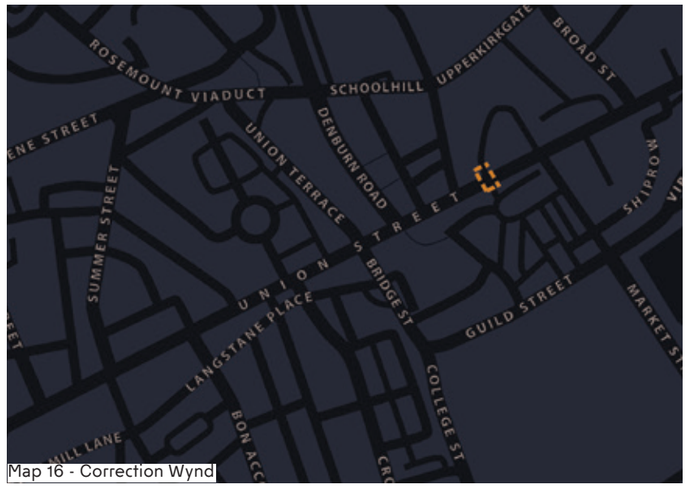
Lighting Elements
Key elements of the scheme are:

- Grazing to the gable ends of the underpass and warm white up lighting to the underpass arch
- Marker lights along the pavement edges towards The Green and the stairway leading to Union Street

Artist impression of Correction Wynd project, no pedestrians

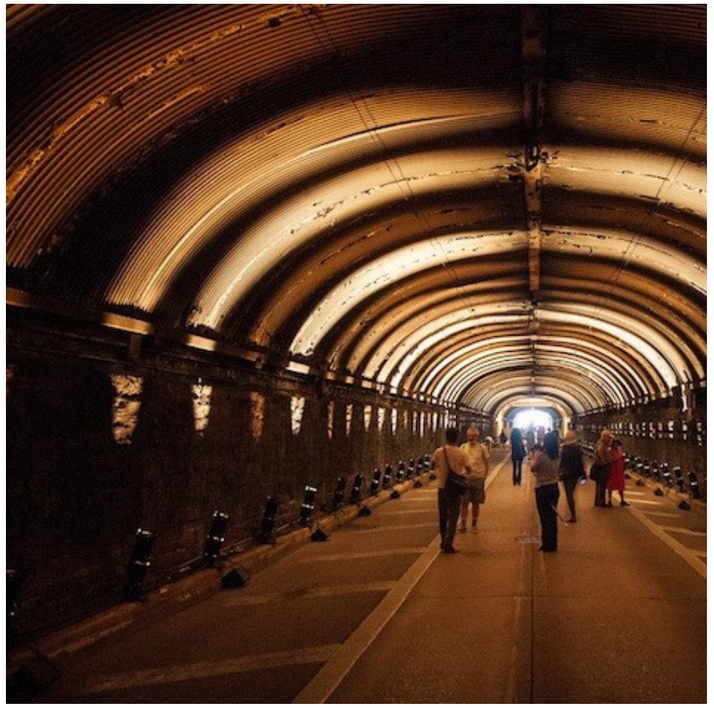
Lighting System Requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.4. Where warm white light is indicated, it shall have a CCT of not more than 2700K. The design shall respect the historic value of the fabric by limiting services reticulation to less sensitive areas. Attachment points to the bridge shall be minimised and fixings restricted to the mortar joints to avoid penetrations in the stone walls. The lighting equipment shall have adequate protection against vandalism and mechanical impact.

Control
Light sensors shall be used to turn the lights on at dusk and off at dawn, thus taking account of annual daylight changes. The control system shall provide presence detection at regular intervals allowing sections of the underpass to be switched on and off as people walk through it.



Map 16 - Correction Wynd


Artist impression of Correction Wynd project, view with pedestrians



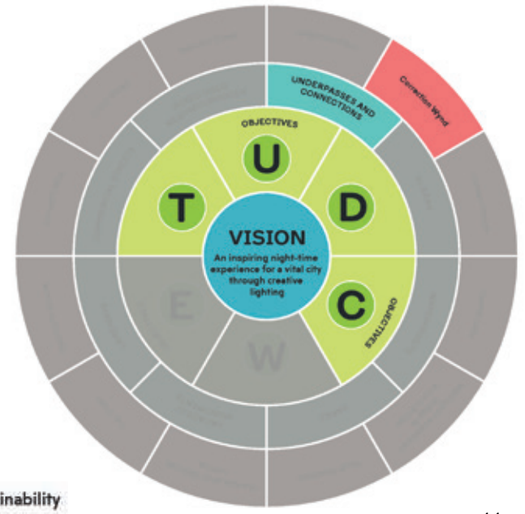
The Langstane place project addresses the following objectives:

Unique Aberdeen

A welcoming **D**estination

A new **C**ity experience

Leadership in **T**echnology and sustainability



3.5.5 Golden Square

Built between 1810 and 1821 Golden Square is an example of a nineteenth century planned square. The surrounding buildings, originally houses are now a mix of offices and residential buildings. A granite statue of the Duke of Gordon stands in the middle of the Square. Golden Square is within the Union Street conservation area. While the buildings maintain the character of the original square the current use as car park has degraded its original appearance and character.

An urban realm project is being planned for this area. The lighting scheme being described here may be implemented in the interim on discontinuation of the car park, or as part of the proposed scheme. Temporary and permanent lighting proposals for the lighting of the Music Hall have been prepared and are planned to be implemented.

Objectives

The main project objectives are to:

- Improve the night time experience, providing amenity and encouraging people to stay longer
- Increase the perception of safety
- Provide a connection between Golden Square and the Music Hall situated on Union Street, S Silver Street and Golden Square

Design Approach

The lighting strategy aims to creatively revive this overlooked square using a simple approach that appeals to the senses, encouraging engagement. Reference to the Music Hall in the vicinity is made through the Music Hall facade lighting and integration of background soundcsapes and lighting in Golden Square. Light ‘spill’ from windows brings the surrounding buildings to life as part of the square night time environment. Urban realm associated works enabling this project include resurfacing of the square and the introduction of perimeter benches.

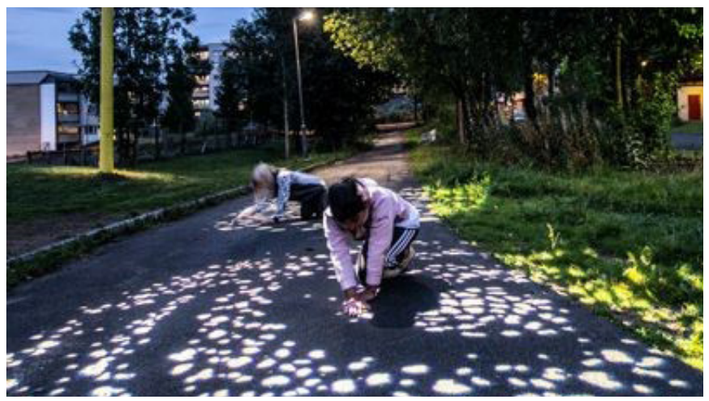
Artist impression of Golden Square project

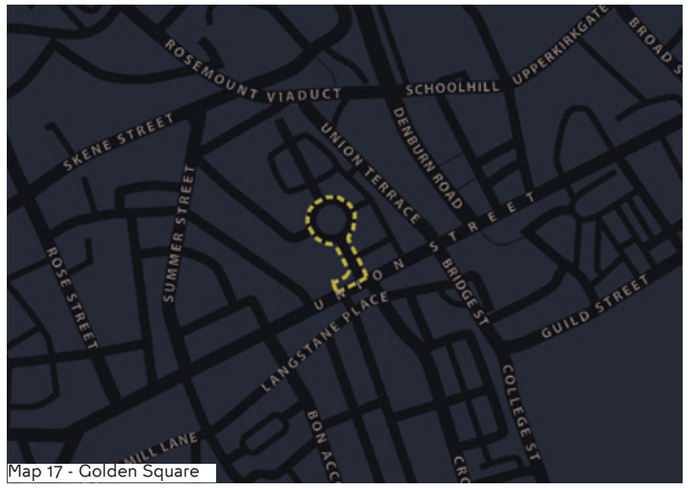
Lighting elements
Key elements of the scheme are:

- Tree uplighting
- Central sculpture uplighting
- Ground projections synchronised with soundscapes using gobo projectors and speakers mounted on poles
- Music Hall facade lighting
- Bench integrated lighting

Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.5. Existing infrastructure shall be used, with the new poles fitted in the location of existing. Accessible lighting equipment shall have adequate protection against vandalism and mechanical impact.

Control
Light sensors shall be used to turn all lights on at dusk and pole lights off at dawn thus taking account of annual daylight changes. Facade lighting should be turned off meeting curfew guidelines. The gobo projectors and music shall be switched off at a time to be agreed with Aberdeen City Council.

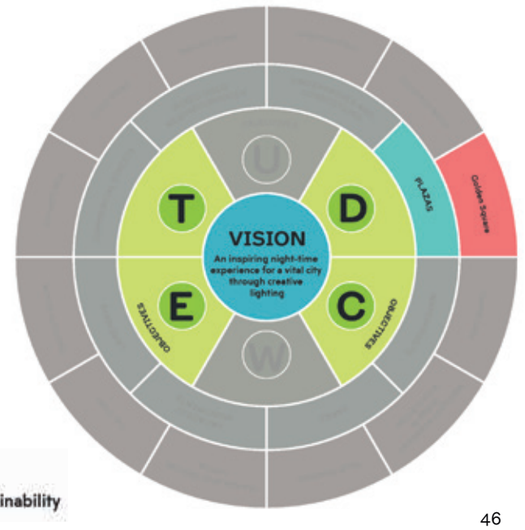




Map 17 - Golden Square

The Golden Square project addresses the following objectives:

A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.6 Castlegate

Castlegate is located to the east end of Union Street. The Mercat Cross with highly decorated medallions and the royal Unicorn on top of a Corinthian capital stands at the centre of the square. At the east end of the square on the site of the medieval Aberdeen Castle is the Citadel.

The design of an urban realm for Castlegate with Union Street is proposed in the CCMP. The lighting scheme being described here is proposed in the interim, as a temporary scheme.

Objectives
The main project objectives are to:
- Improve the night time experience, create ambiance and provide a place for people to stay and interact
- Enhance the feeling of safety
- Promote sustainably powered light

Design approach
A simple lighting approach is proposed using high quality elegant solar powered luminaires and integrating the architectural backdrop in the night time experience of the space by lighting important features. The Mercat Cross remains the focus of the square at night and lit seating elements will allow people to linger.

Lighting elements
Key elements of the scheme are:
- Lighting of features of the Mercat Cross and the surrounding façades
- Provision of solar powered light poles, integrating wi-fi
- Urban seating elements with integrated lighting

Artist impression of Castlegate project

Lighting design requirements

The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.5. The illumination of the Mercat Cross shall be considerate of its listed status and irreversible interventions will not be permitted. The layout of the benches shall consider the installation causing the least damage possible to the existing surface. The existing paving slabs shall be lifted to allow the passage of services and reinstated as part of the project implementation. Accessible lighting equipment shall have adequate protection against vandalism and mechanical impact.

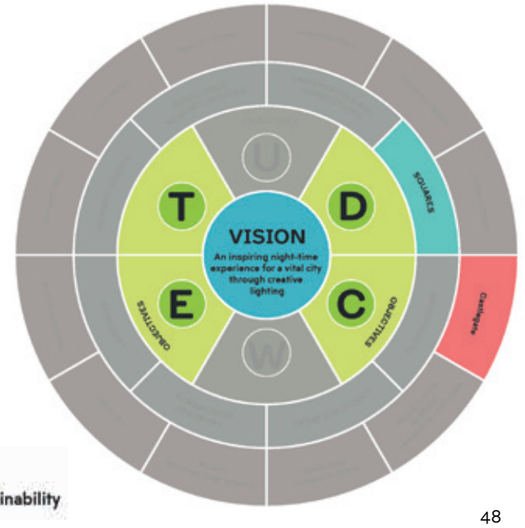
Control

Light sensors shall be used to turn all the lights on at dusk and the street lights off at dawn thus taking account of annual daylight changes. Facade lighting should be turned off meeting curfew guidelines. The benches shall be switched off at a time to be agreed with Aberdeen City Council.

Map 18 - Castlegate

The Castlegate project addresses the following objectives:

A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.7 Wellington and Victoria Bridges

The Wellington Suspension Bridge and the Victoria Bridge connect the city centre to Torry Waterfront over the River Dee. The Wellington Bridge goes back to 1830 and has undergone restoration works in 1930 and in 2006/2007. The bearers and suspensions are now made of steel while original iron main chains remain. The Victoria Bridge was built in 1881 and consists of 5 granite arches and 4 piers. Iron lamp standards, originally gas lamps sit on the parapet of the bridge.

Objectives
The main project objectives are to:

- Create connectivity between different parts of the city and between the city centre and the riverfront
- Assist in making the waterside a night time destination within the city centre
- Increase the perception of safety at night along the river
- Create surprising vistas from the bridges to the riverbanks and vice versa

Design approach
Selected architectural elements of the bridges are highlighted: On Victoria Bridge the arches are illuminated creating subtle mirroring water reflections. The existing lanterns on the carriageway are retained and refurbished.

Illuminating both edges of the arches only with a narrow light blade effect can be considered in lieu of washing the entire arch on Victoria Bridge.

On Wellington Bridge, the structural chain supports and the archways are the highlighted features. General lighting is provided on the foot-way of this bridge.

The colour of the archway, footpath and street-lighting are to be warm white at all times, whilst the support chains and bridge arches are lit in either warm white or a contrasting colour on specific days as agreed with Aberdeen City Council.

Artist impression of Victoria bridge project


Artist impression of Wellington bridge project

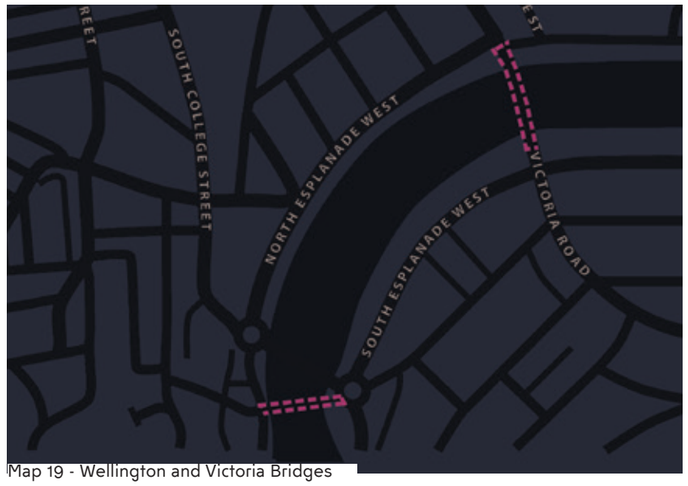
Lighting elements
Key elements of the scheme are:

- Refurbishment, re-lamping and fitting of optical control to the existing lanterns on Victoria Bridge
- Up lighting to the arches of the Victoria bridge
- Up lighting of the inner archways on both ends of Wellington Bridge
- Lighting of the chain supports on Wellington bridge

Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.6. Lighting equipment at water level shall be suitable to resist the harsh weather conditions. On the footbridge lighting equipment shall have adequate protection against vandalism and mechanical impact.

The river is a Special Area of Conservation and appropriate environmental impact assessment will be required. Lighting has to be carefully placed and designed so that the installation is not harmful to the ecology and does not disrupt the behaviour of fish, particularly their diurnal activities. To this end, no light sources are to be directed to the water and all light sources are to be shielded. The lit surfaces need to remain non-reflective to minimize impact. It is recommended to seek advice from specialists such as ichthyologists about migratory times as part of the design development process.

Artist impression of Victoria bridge project



Map 19 - Wellington and Victoria Bridges

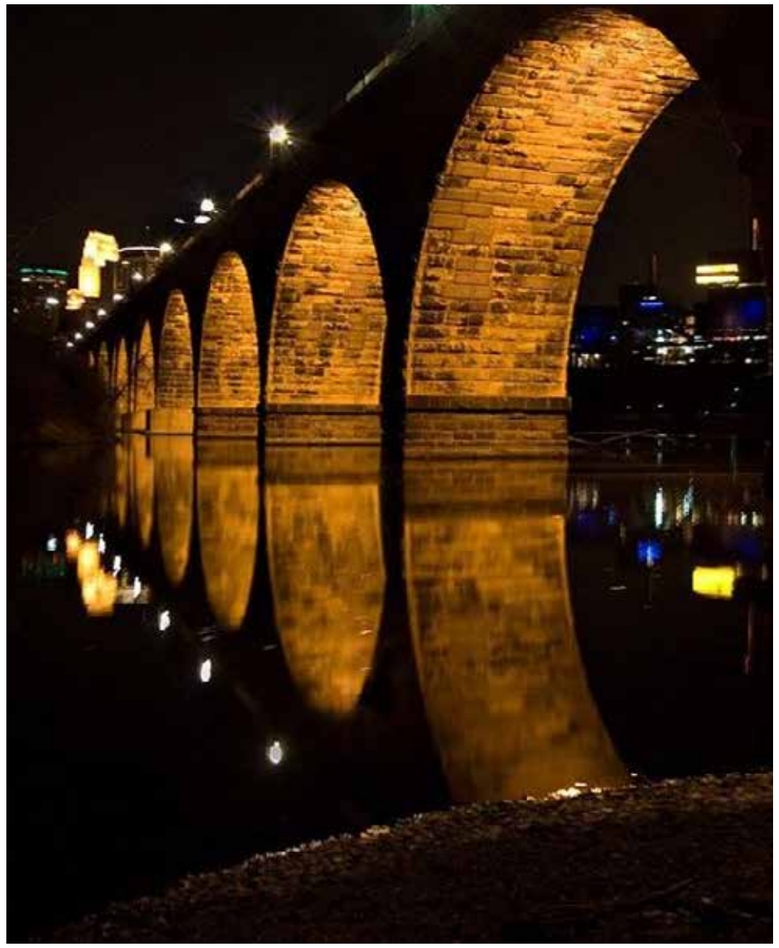
Maintenance access and frequency is to be considered as part of the design. Re-use of existing infrastructure and mounting points is to be investigated where feasible.

Control
Light sensors shall be used to turn lights on at dusk and off at dawn, thus taking account of annual daylight changes.

The control system shall allow for dimming and the ability to regularly change colour and synchronize the lighting for both bridges.

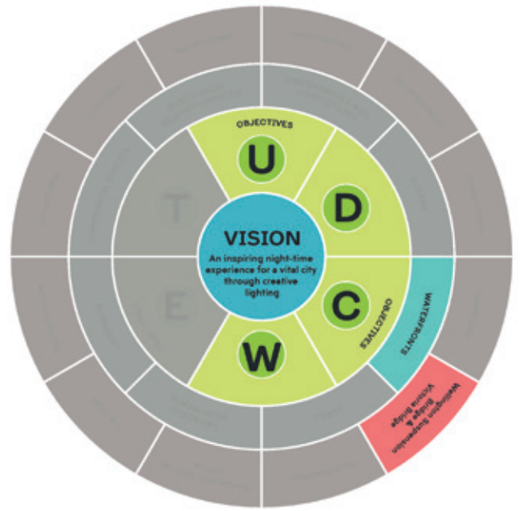
To minimise negative consequences to the environment, lighting is to be switched off between midnight and dawn where most fish migration occurs; and possibly completely during migration periods, confirmed through an appropriate environmental assessment.

Blade effect to the inside and outside edges of arches on Victoria bridge can be considered as alternative to a continuous lighting effect (for ease of maintenance).



The Wellington and Victoria Bridges project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Waterfront connections



3.5.8 Riverbanks

This area is framed on both sides by the Wellington and the Victoria Bridges (refer to 3.5.7). A new riverside district including expansion of the riverside park is proposed in the Aberdeen City Masterplan which includes promenades and a naturalistic habitat.

Objectives
The main project objectives are to:
- Make the waterside a night time destination
- Increase the perception of safety at night along the river
- Promote artistic expression

Design approach
A pleasing atmosphere is created through lighting and a recognisable light art installation and its reflections on water on one of the gateways into the city. Due to the topography, views from one section of the riverbank to another generate surprising vistas.

Lighting elements
Key elements of the scheme are:
- A three-dimensional colourful light art piece along the south riverbank edge that respects the context. The light art shall be developed in conjunction with local artist/s.
- Tree up lighting along the riverbanks, predominantly the north riverbank.

Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.7.
In selecting luminaires consideration shall be given to the vegetation maintenance strategy to ensure that the design light output is maintained for the duration of the installation. Lighting equipment shall have adequate protection against vandalism and mechanical impact and shall be suitable for the harsh weather conditions.
The river is a Special Area of Conservation and appropriate environmental impact assessment will be required. Lighting

Artist impression of Dee Riverbanks project

has to be carefully placed and designed so that the installation is not harmful to the ecology and does not disrupt the behaviour of fish, particularly their diurnal activities. To this end, no light sources are to be directed to the water and all light sources are to be shielded. The lit surfaces need to remain non-reflective to minimize impact. It is recommended to seek advice from specialists such as ichthyologists about migratory times as part of the design development process.

Control

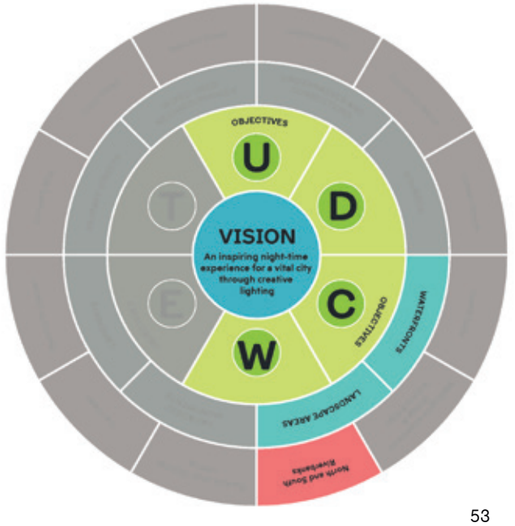
Light sensors shall be used to turn lights on at dusk thus taking account of annual daylight changes. The art lighting should be turned off automatically meeting curfew guidelines. To minimize negative consequences to the environment, lighting is to be switched off between midnight and dawn where most fish migration occurs; and possibly completely during migration periods.

The tree lighting shall be dimmed down and switched off automatically at times to be agreed with Aberdeen City Council, which time shall be consistent with switching off of the Victoria Bridge.

Map 20 - Riverfronts

The Riverbanks project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Waterfront connections



3.5.9 The Kirk of St. Nicholas

The Kirk of St. Nicholas Uniting, also known as the 'Mither Kirk' (mother church) is of great historic and architectural value; a grade A listed building. It is located in the hearth of the city, just off Union Street with its spire key to the Aberdeen skyline. Its origins date back to the 12th Century and the church still holds numerous medieval effigies and architectural features, although it has undergone a series of alterations over the years. The Gothic clock tower was re-built after a fire destroyed it in 1874. In 1998 the stained glass window at the entrance marked the 500 year anniversary of the enlarged church. The Kirk is in direct dialogue with a colonnade entrance marking the entry to the church grounds.

Objectives
The main project objectives are to:

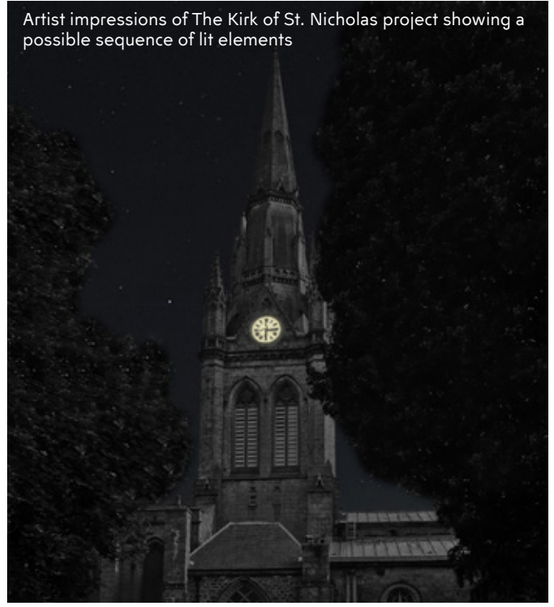
- Reveal the architectural legacy and the Aberdeen City skyline in their best light against the night sky.
- Stimulate interest and create a welcoming city with a cultural backdrop, which is part of Aberdeen's identity
- Form visual connections during hours of darkness supporting with wayfinding
- Make a significant landmark for planes and trains

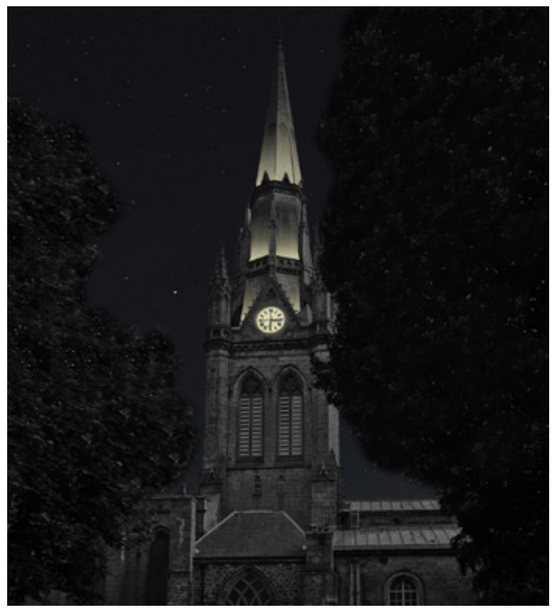
Design approach
Lighting follows architecture, highlighting its important architectural features and revealing the layered history of the church with a combination of back lighting and front lighting. The scheme will consider the three-dimensionality of the church, illuminating all façades with emphasis on the aisle ends and East/West façades.
A dynamic installation with selected features illuminated in a sequence at specific times of the day or special events provides added interest.

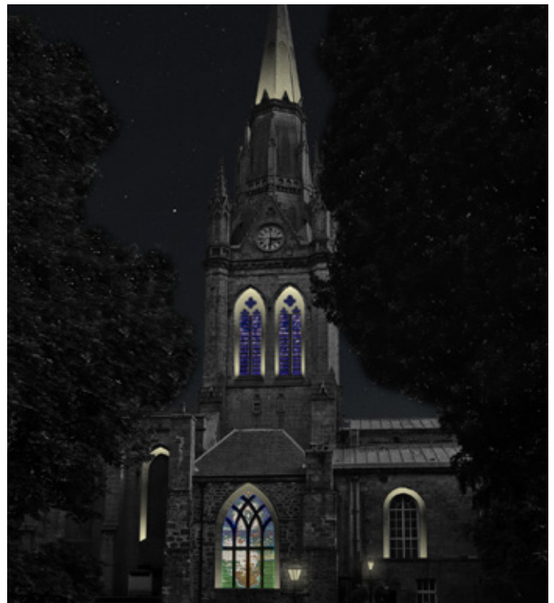
Lighting elements
Key elements of the scheme are:

- Lighting of the surroundings, namely that of the churchyard arched entry and re lamping of existing lanterns.
- Exterior architectural lighting focusing on window and door reveals, buttress walls, the clock-tower and the spire.
- Interior back lighting of stained glass windows.
- Interior lighting to the bell chamber in a blue hue, relating to the colours projected by the stained glass lighting and the colour of divinity. The louvres of the bell chamber would required to be left in an open position for the illumination to work effectively.

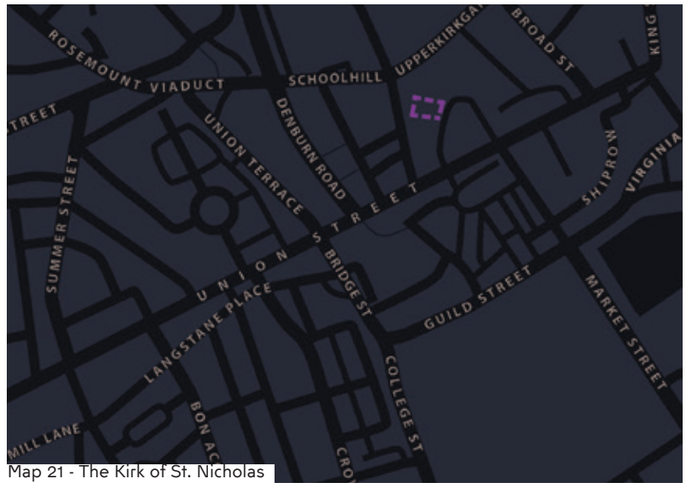
Artist impression of The Kirk of St. Nicholas project







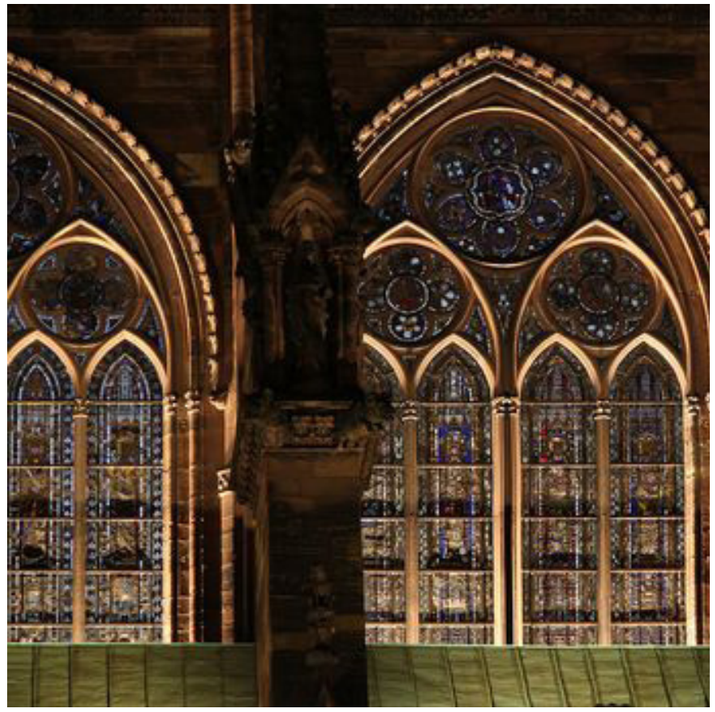
The Kirk's architectural features come to life at night one after the other in a sequence.

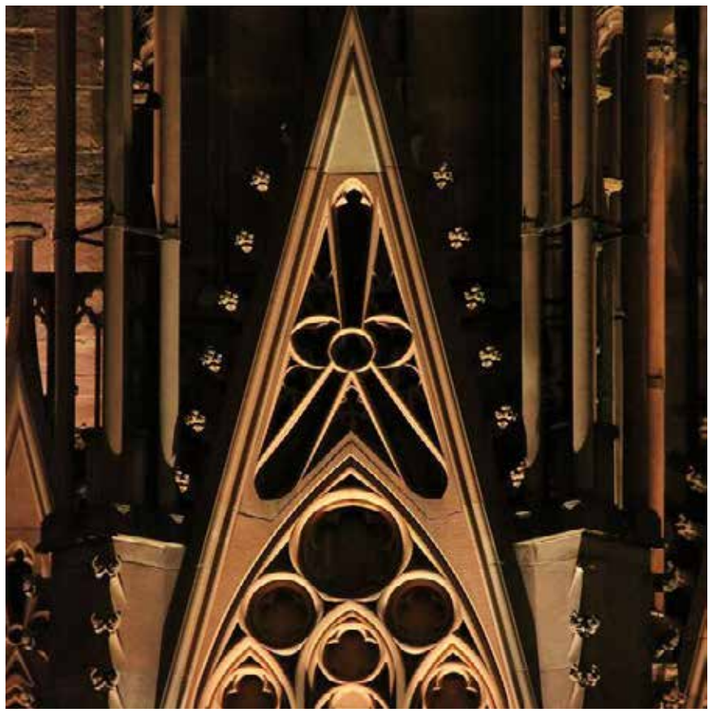


Map 21 - The Kirk of St. Nicholas

Lighting system requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.8. Warm white light shall be used generally with contrasting cooler tones for the back lighting of the stained glass windows and the blue tone of the bell chamber. The lighting system shall achieve a low power density and high fixture efficiency. All lighting hardware shall be concealed from pedestrian view. The integrity of the building shall be respected, attachment points minimised with fixings in mortar joints to avoid penetrations in the stone walls.

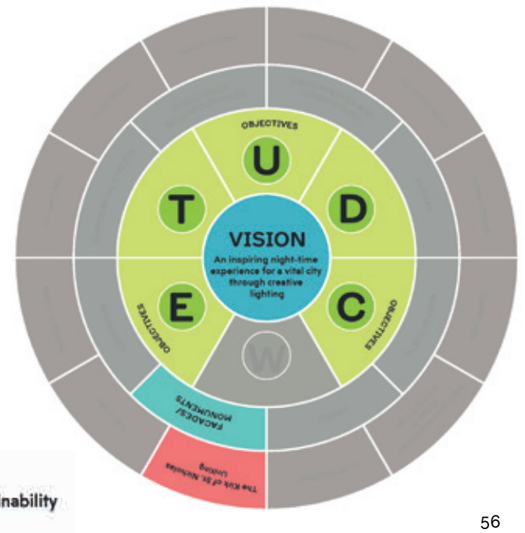
Control system
In order to reduce energy consumption, limit light pollution and ensure that the installation is on when it may be appreciated an automatic lighting control system shall be provided with light sensors to turn the lights on at dusk and a time clock to turn the lights off, meeting curfew recommendations.





The Kirk of St. Nicholas project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.10 The Green

The Green is one of the oldest parts of the city. Flint remains revealed prehistoric activity but The Green is mainly remembered as a medieval quarter in a strategic location close to the harbour. This area is within the Union Street Conservation Area and part of the Townscape Heritage Initiative.

Objectives
The main project objectives are to:

- Create unique vibrant experiences throughout the year, generating interest encouraging visitors to stay longer and to return
- Improve the perception of safety
- Increase activity and enhance the character of the square
- Promote artistic and cultural expression
- Support the night time economy

Design approach
Human scale is the centre of the lighting strategy for this area. A Green specific luminaire contributes to the identity of the area. Distinctive accents are created by activating surfaces part of the built environment.

Lighting elements
Key elements of the scheme are:

- Projection mapping to the walls or ground surfaces across The Green, involving artists in the projection content development
- Illuminated artwork
- Use of designated walls on The Green as canvas for community film screenings
- Luminaire clusters specific to The Green, providing general illumination and an added ambient light layer.

Artist impression of The Green project

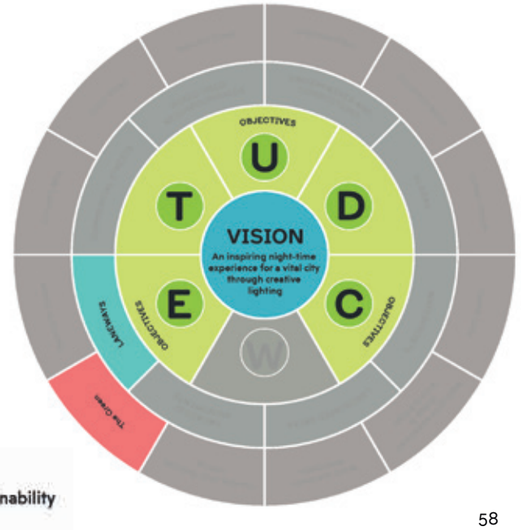
Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.9. New pole luminaires shall be installed in the location of existing luminaires to incur the least possible damage and utilise existing infrastructure. Accessible lighting equipment shall have adequate protection against vandalism and mechanical impact. Projection equipment shall be mounted in discreet but accessible locations and have adequate ingress protection.

Control
Light sensors shall be used to turn all lights on at dusk and street lighting off at dawn, thus taking account of annual daylight changes. The art lighting and projections should be turned off automatically meeting curfew guidelines.

Map 22 - The Green
Full project extent outlined and catalyst project shown shaded

The Green project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.11 Adelphi Lane

Adelphi and Adelphi Lane host mainly residential buildings but also small businesses. They are situated within the Union Street Conservation Area.

Objectives
The main project objectives are to:
- Enhance the character of the laneways and create a welcoming atmosphere.
- Focus on the pedestrian scale
- Give each laneway its own identity
- Encourage small businesses to set-up in the laneway which will improve the night time economy

Design approach
Artistic expression and wayfinding are revealed as part of Merchant Quarter nightscape. The charm characteristic of laneways is re-introduced in Adelphi. The warm ambiance of traditional lanterns in laneways is recreated through the use of high quality contemporary luminaires, reflecting the times of this installation. Laneway identity is projected through emphasis of its name into the night time experience.

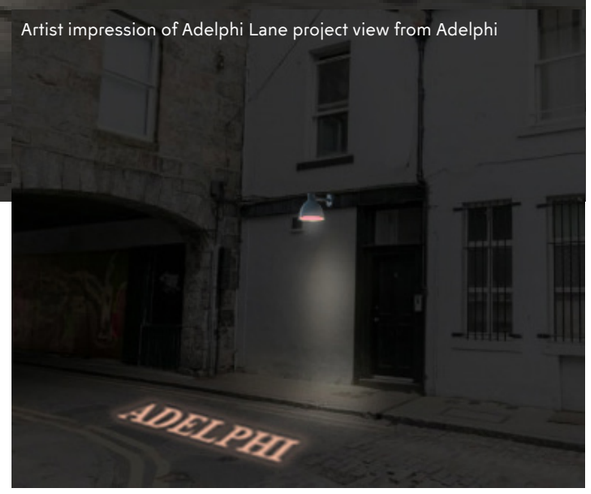
Lighting elements
Key elements of the scheme are:
- Illumination of murals where applicable
- Replacement of existing wall mounted lanterns with lanterns of various colour, one colour for each laneway
- Projection on the ground of the name of the laneway in the same colour as that of the lanterns
- Illumination of wayfinding signage

Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.9. Existing lantern infrastructure shall be used wherever possible. Light pollution and obtrusive light to residential buildings shall be avoided.

Artist impression of Adelphi Lane project, view from Union Street

Artist impression of Adelphi Lane project view from Adelphi

Map 23 - Adelphi Lane



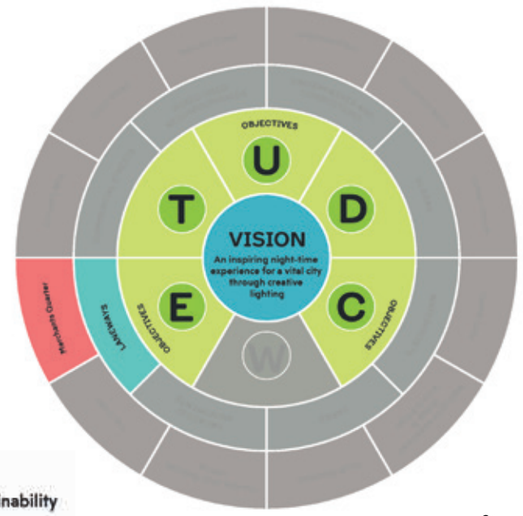
Artist impression of Adelphi Lane project view from Adelphi

The daytime visual impact of lighting hardware for the projection and vertical illumination shall be as minimal possible.

Control
Light sensors shall be used to turn all the lights on at dusk and switch off the lanterns at dawn, thus taking account of annual daylight changes. Other lighting part of the scheme shall be turned off automatically at a time to be agreed with Aberdeen City Council.

The Adelphi Lane project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Night-time **E**conomy
Leadership in **T**echnology and sustainability



3.5.12 Donald's Way

Donald's Way is a narrow connection situated between His Majesty's Theatre and St. Mark's Church connecting Skene Street to Rosemount Viaduct. The historic buildings on both sides of this connection are listed.

Objectives
The main project objectives are to:
- Create an animated experience introducing fun and curiosity, encouraging pedestrians to use this connection at night, as they would during the day
- Increase the sense of safety
- Reinforce the spatial qualities of this narrow connection
- Promote science and technology

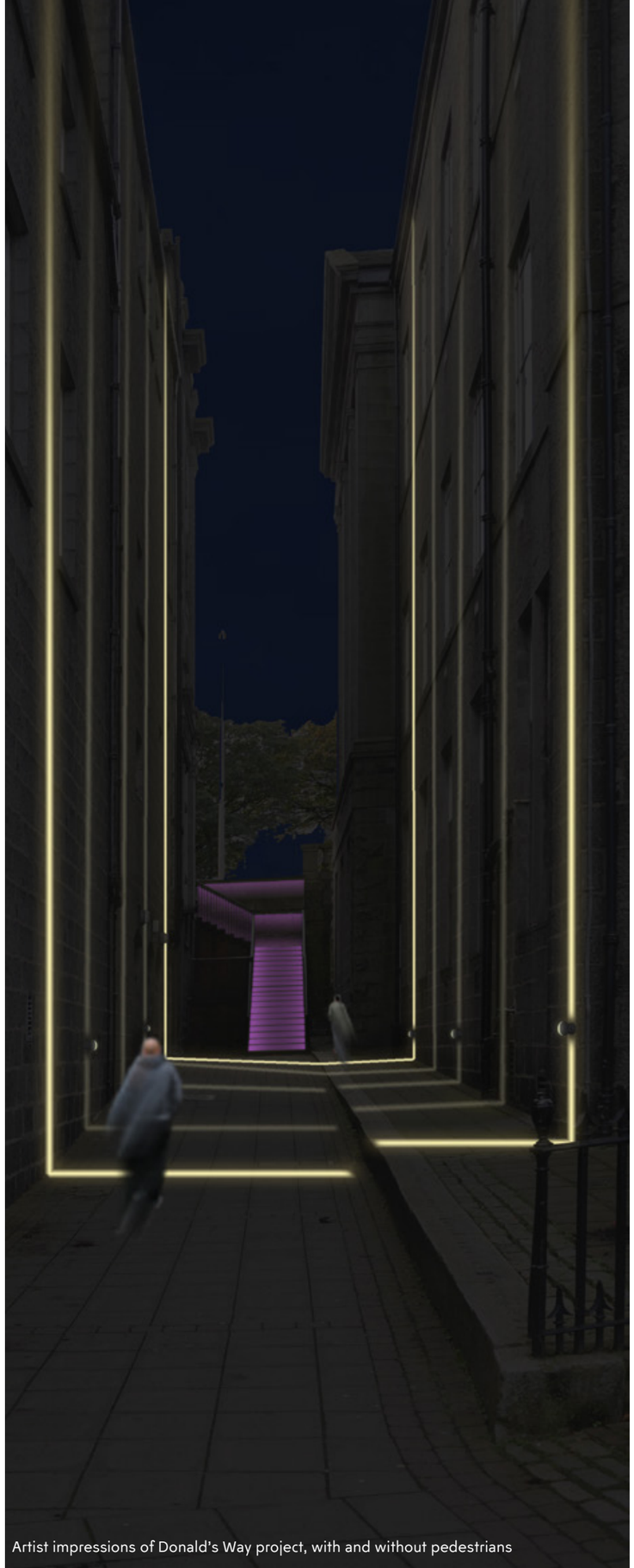
Design Approach
Playful 'blades' of light on the three surfaces of the laneway turn on and off as pedestrians are moving through it. The stairs leading to a cultural area within the city centre is illuminated , marking a destination point. Interaction is encouraged through the response of light to movement along the laneway.

Lighting elements
Key elements of the scheme are:
- Wall mounted luminaires on both sides of the laneway connection, projecting lines of light
- Handrail integrated lighting to the stairs at the end of the laneway connection

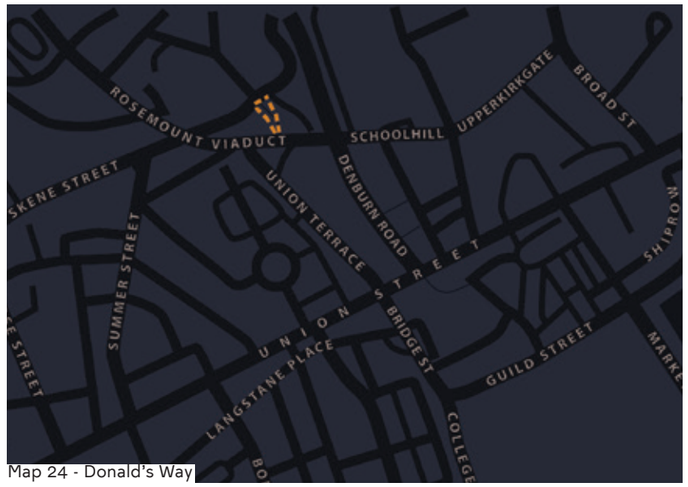
Lighting design requirements
The installation shall meet the quantitative and qualitative requirements as set out in section 3.4.4. Lighting equipment shall have adequate protection against vandalism and mechanical impact. Optical control shall be used to mitigate light pollution.

Control
Light sensors shall be used to turn all the lights on at dusk

Artist impression of Donald's Way project



Artist impressions of Donald's Way project, with and without pedestrians

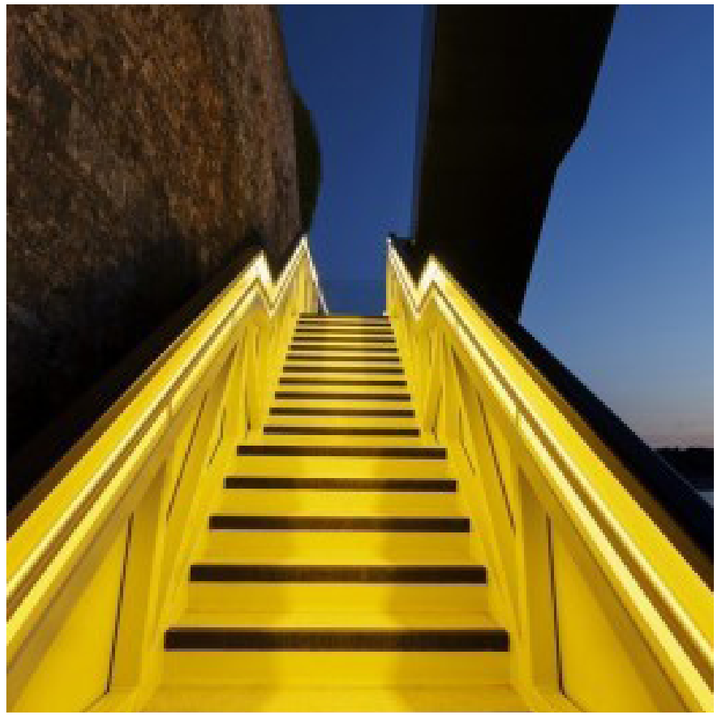


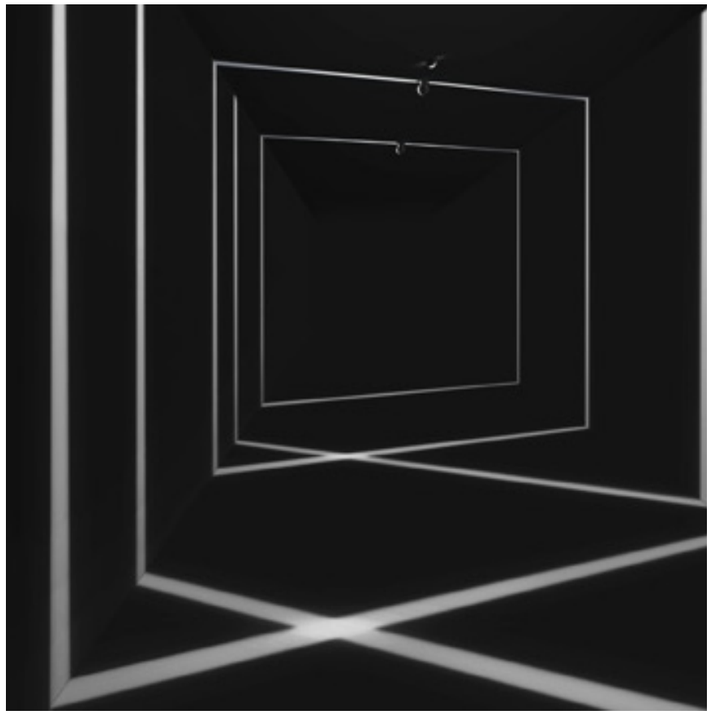
Map 24 - Donald's Way

and switch off at dawn, thus taking account of annual daylight changes. The control system shall provide presence detection allowing the intensity of sections of the installation to be switched on and off as people walk through.

Engagement

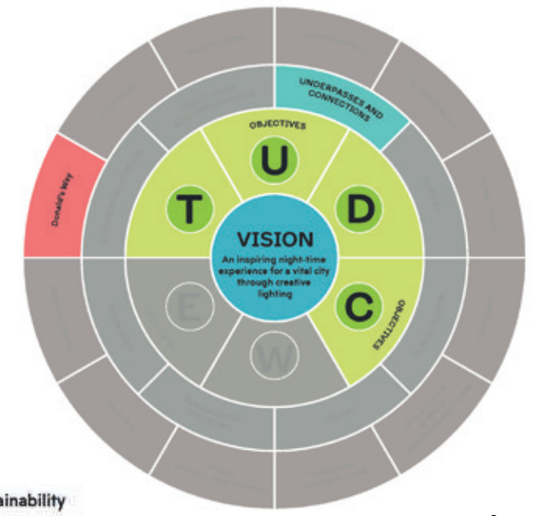
The project provides an opportunity to engage with the Creative Learning projects programme to develop technology for this project such as allowing light to respond to pedestrian movement and generating kinetic energy from footfall.





The Donald's Way project addresses the following objectives:

Unique Aberdeen
A welcoming **D**estination
A new **C**ity experience
Leadership in **T**echnology and sustainability



4 IMPLEMENTATION STRATEGY

12 Projects are proposed as part of the creative lighting strategy.

Each of the projects will have their individual implementation strategies and cost plan that will include:

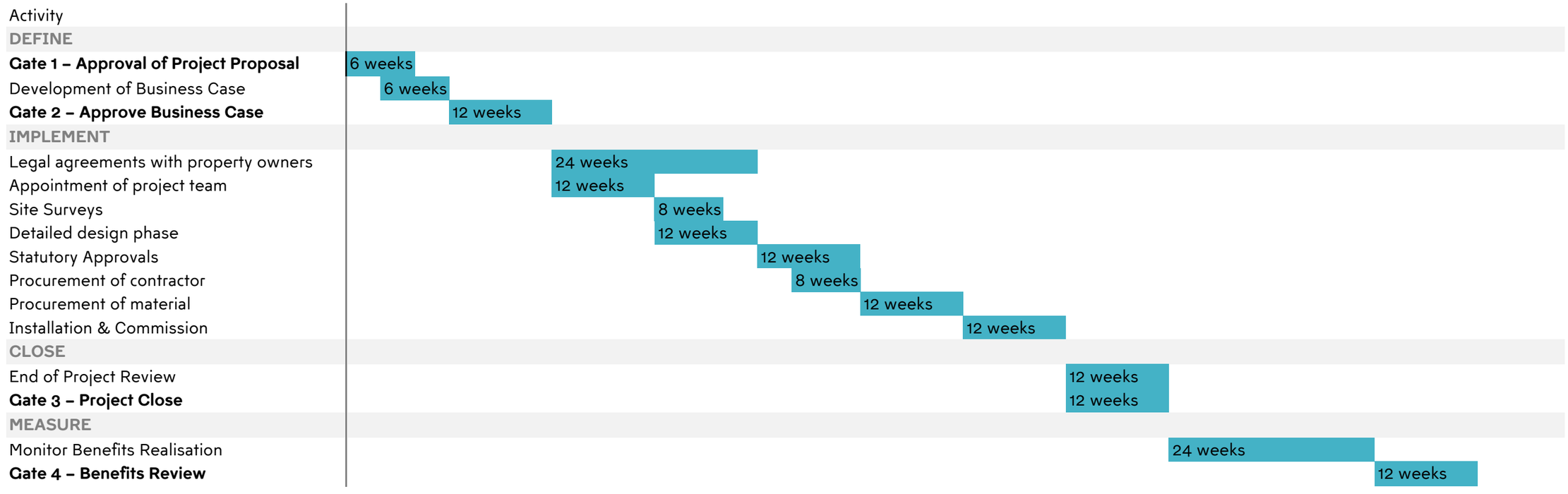
- Description
- Location
- Interdependencies
- Programme
- Investment
- Maintenance

An indicative overarching programme provides a sequence of the project implementation over a five year period.

5 Year Implementation Programme

4.1 Programme

A generic project programme has been developed to align to ACC's project governance structure, alongside general consideration at an outline level of the tasks applicable to all proposed projects under this strategy. This enables an outline framework that ACC can build upon when taking each project business case forward. Durations included are speculative in nature and are based on the project team's and ACC representatives' experiences. Consideration should also be given to procurement strategies, as at present all projects are based on a traditional form. Upon approval to progress the individual project teams should look to develop the project based on the developed design that emerges. It is recommended that a review of the phasing is considered to maintain value during delivery stages.



Generic project implementation programme

4.2 Cost

The overall costs by project are detailed in the following sections 4.4.1 to 4.4.12 and include implementation (capital) costs and life cycle costs.

Implementation costs include the supply + install cost and development cost. The following constitute the supply + install cost:

1. **Supply and installation of lighting equipment** which includes luminaires and controls. MEP sub-contractor preliminaries are allowed for in this section.

2. **Cabling works** including wiring for luminaires and controls, allowance for access equipment, testing/commissioning and MEP sub-contractor preliminaries.

3. **Architectural/structural works** including associated builders' work such as trenching, protection enclosures, making good and hoarding works in accordance with the project requirements.

4. **Infrastructure works** covering new electrical infrastructure where it is currently unavailable.

Development costs, additional to the supply and install cost, are estimated based on the following breakdown:

item	description	cost
1	Main Contractor Preliminaries	20% of total project cost
2	Main Contractor OH&P's	5% of total project cost + item 1
3	Inflation to 4Q19 based on G&T TPI's	2.01% of total project cost + item 1 & 2
4	Design Development Contingency	5% of total project cost + item 1, 2 & 3
5	Construction Risk Allowance	5% of total project cost + item 1, 2, 3 & 4
		10% of total project cost + item 1, 2, 3 & 4 where fixing to listed surfaces is required.
6	Professional Fees, Surveys & Other Costs	15% of total project cost + item 1, 2, 3, 4 & 5
8	Allowance for Project Contingency	10% of total project cost + item 1, 2, 3, 4, 5 & 6

Life cycle costs include operating and maintenance costs covering energy cost, equipment replacement, equipment maintenance, equipment cleaning and disposal of the lighting installation. This costs shall be considered as part of the project development.

4.3 Maintenance

Properly maintained equipment is an essential prerequisite of all 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 is affected by factors such as vibration and poor adjustment after lamp replacement. These characteristics spoil the designed appearance and waste energy.

The preferred maintenance routine is to replace defective lamps (including lamps with degraded output) upon notification of faults, particularly where safety and lit appearance are critical. A preventive regular inspection, cleaning and maintenance programme should be in place with the inspection, cleaning and maintenance cycle driven primarily by the cleaning requirements for the installations (e.g. every 12, 24 or 36 months depending on lamp technology and location). The inspection shall include and record 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
   - Physical interference such as vegetation
   - Verification of night time operation
3. Replacement of any readily replaceable defective or broken components
4. Determination of current/imminent major repair or replacement required
5. Cleaning of luminaire lens and reflectors and, bulk lamp replacement
6. Repair of luminaire housing and pole damage including corrosion and paint damage
7. Return recovered components for recycle or appropriate disposal. Failed lamps should be sent to an appropriate recycling facility

It is recommended that a luminaire maintenance and lamp replacement schedule are 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

As part of a smart control system, a solution that can be remotely managed and monitored providing alerts when a luminaire fails would be recommended. This allows faulty fittings to be quickly located and replaced resulting in reduced maintenance costs and a safer street environment.

It is recommended that Aberdeen City Council has a plan that enforces the maintenance strategy allocated to third parties to ensure that the designed appearance is maintained.

4.4 Project Implementation

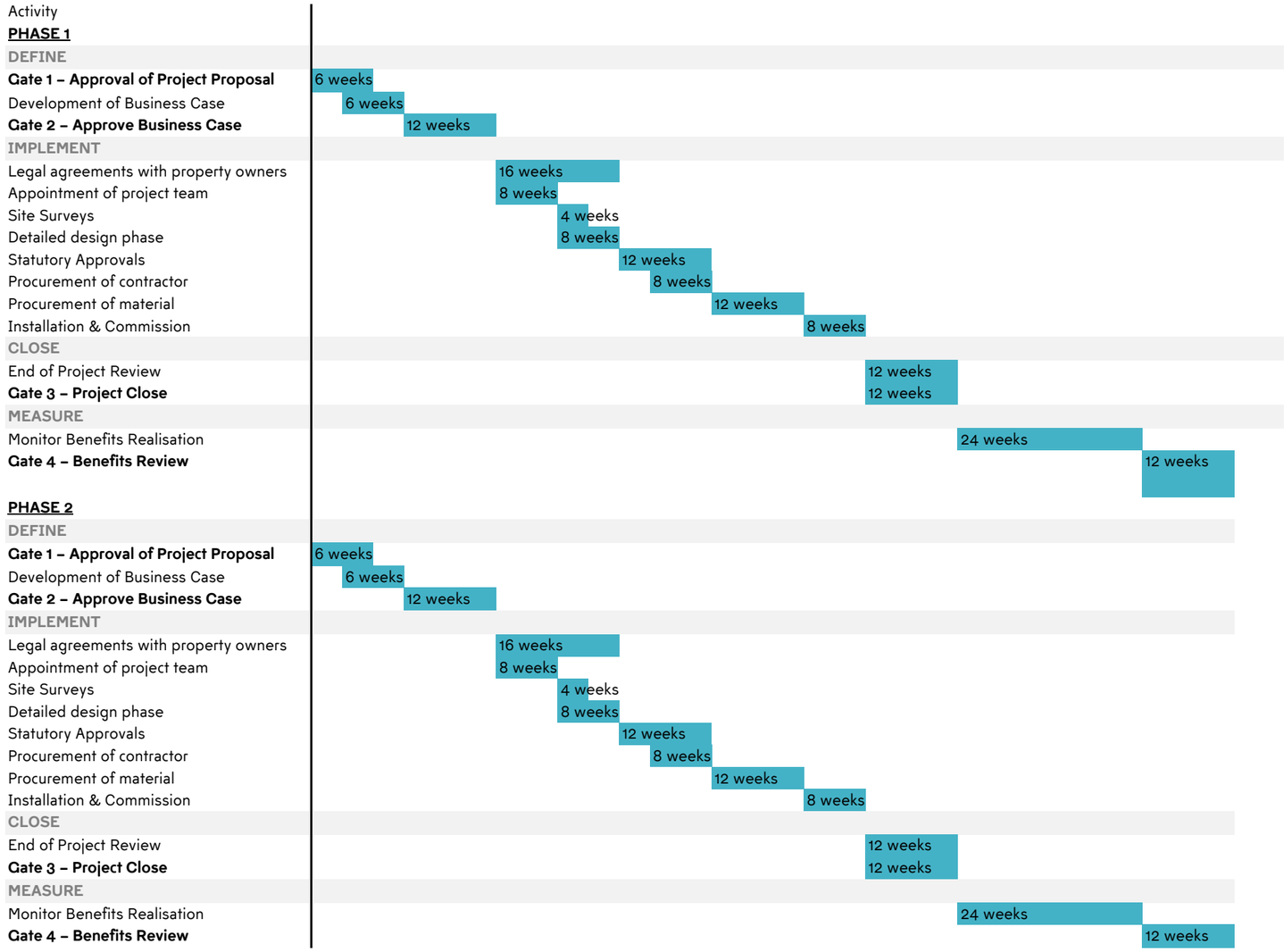
4.4.1 Union Street

Implementation

The project consists of selective facade lighting and two types of catenary lighting along Union Street. The project will encourage night time economy activation, create entertainment and emphasise Union Street as an important destination in the city. The catalyst project may be rolled out in two phases with the installation of the side pendant luminaires installed following luminaires along the centre of the street, when the pedestrianisation proposal part of the masterplan is implemented.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met
- Co-ordination in implementation with public realm scheme for Union Street



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.
5. Phasing has been implemented by ACC to align to funding availability, it is anticipated each phase will be implemented within different financial years.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of catenary lighting, pendant lighting & façade lighting to a 150m section of Union Street only. Costs exclude infrastructure works, landscaping works & value added tax				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	96,800	96,800
	Cabling Works	1	Item	62,600	62,600
	Associated Architectural / Structural Works	1	Item	93,500	93,500
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**253,000**
	Development Cost Allowance For Implementation Costs (Capital Costs)	1	Item	222,000	222,000
	Additional Elements Implementation Costs (Capital Costs)				
	Pendant Lighting Including All Associated Works	1	Item	440,900	440,900
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	441,000
	Development Cost Allowance For Additional Elements Implementation Costs (Capital Costs)	1	Item	387,000	387,000

TOTAL	1,303,000

Considerations

- Possible fixings onto listed façades
- The fixing points of the existing street luminaires shall be utilised with additional sensitively designed poles for areas where there are no buildings to mount the cable support on

Funding opportunities

- Opp North East Local growth fund (improve economy, specialised innovation within urban space)
- EU funding (smart sustainable and inclusive growth)*
- Heritage Lottery Fund (historic façade lighting)
- Aberdeen City Council capital funding and/or Growth Accelerator

Maintenance

Maintenance responsibilities of the installation could be as follows:
- Catenary lighting by Aberdeen City Council
- Facade lighting by the building owners

The maintenance strategy shall consider the least disruption for the running of this street as well as health and safety issues. Lighting hardware selection shall consider the maximum possible lifetime.

The above capital cost allows for spare luminaires allocated. As a consequence the ongoing maintenance cost should have a nil net increase in comparison with the current installation.

* With the planned UK withdrawal from the EU in 2019, there is uncertainty about EU funding. Equivalent UK funding at the time of project definition is to be sought.

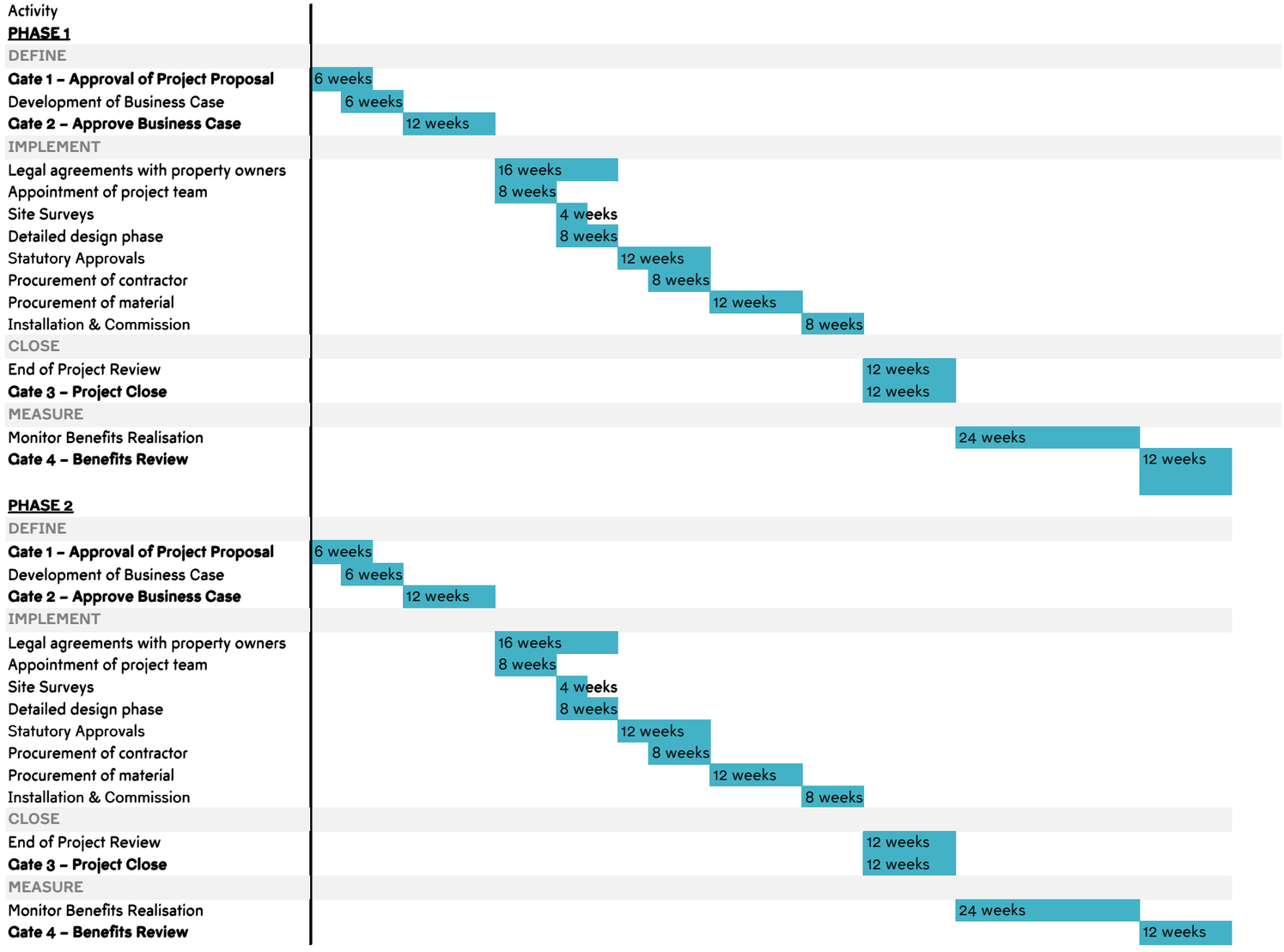
4.4.2 Belmont Street

Implementation

The project consists of selective facade lighting, consistent shop projecting signage and catenary lighting system. It will improve the night time economy of Belmont Street and create an appealing night time environment.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met
- Consent and commitment of local businesses



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.
5. Phasing has been implemented by ACC to align to funding availability, it is anticipated each phase will be implemented within different financial years.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of catenary lighting, linear luminaires, in ground lightings & façade lighting to Belmont Street. Costs exclude infrastructure works, landscaping works & value added tax				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	163,100	163,100
	Cabling Works	1	Item	133,500	133,500
	Associated Architectural / Structural Works	1	Item	113,000	113,000
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**410,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	359,600	359,600
	Additional Elements Implementation Costs (Capital Costs)				
	Signage Lighting Including All Associated Works	1	Item	60,800	60,800
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**61,000**
	Development Cost Allowance for Additional Elements Implementation Costs (Capital Costs)	1	Item	53,300	53,300

TOTAL	884,000

Considerations

- Possible fixings onto listed façades
- The fixing points of the existing street luminaires shall be utilised

Funding opportunities

- Private owners and Aberdeen Inspired (co-ordinated approach for street/shop front)
- Common Good Fund (unifying shop fronts to improve experience and city portfolio)
- Heritage Lottery Fund (uplighting to the churches)
- Aberdeen City Council capital budget and /or Growth Accelerator

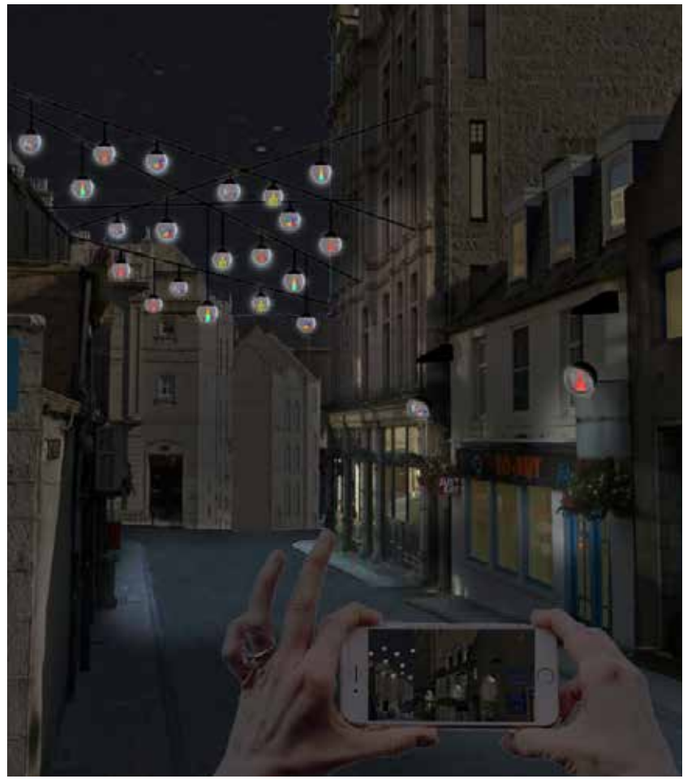
Maintenance

Maintenance responsibilities for the installation of catenary lighting shall be by Aberdeen City Council, the facade lighting by the building owners and the shop signage through a lighting maintenance contract funded by Aberdeen Inspired.

The maintenance strategy shall consider maintenance disruptions to the street as well as health and safety issues. Lighting hardware selection shall consider the maximum possible lifetime.

The design shall aim to achieve a nil net increase in maintenance costs of the central catenary system when compared to the current street lighting installation.

4.4.3 Langstane Place

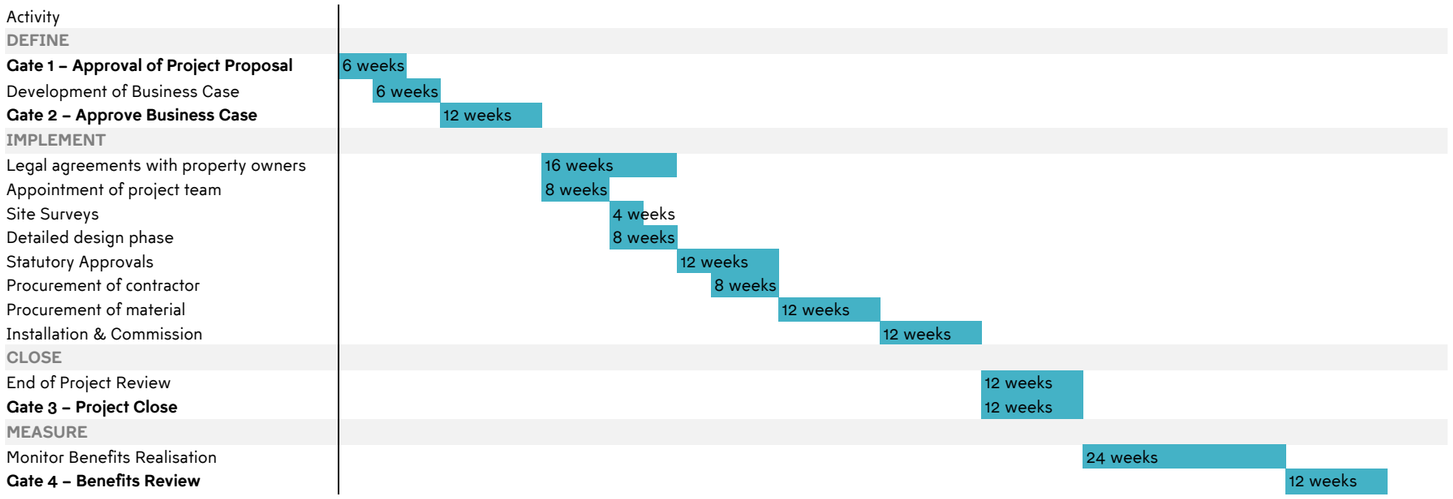


Implementation

This catenary installation with the involvement of the community creates a destination point in a currently overlooked area of the city. It will create a landmark that locals can relate to.

Interdependencies

- Planning consent to be acquired
- Engagement with building owners to obtain permission for the scheme



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works				
	The supply & installation of bespoke catenary lighting & bespoke wall mounted luminaires to Langstane Place. Costs exclude infrastructure works, landscaping works & value added tax				
	Information Used				
	Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	54,600	54,600
	Cabling Works	1	Item	22,100	22,100
	Associated Architectural / Structural Works	1	Item	18,800	18,800
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	96,000
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	82,900	82,900

TOTAL	179,000

Considerations

- Engagement opportunities for the creation of the artwork, part of the luminaires
- The fixing design and installation shall be in line with conservation best practice

Funding opportunities

- Aberdeen inspired
- Creative Scotland
- Common Good Fund
- Crowd funding (via schools, etc. that might be part of the ultimate display).
- Aberdeen City Council capital budget and /or Growth Accelerator

Maintenance

The Langstane Place installation could be maintained by the business owners in the street, subject to discussion.

The maintenance strategy shall consider health and safety issues. Lighting hardware selection shall consider the maximum possible lifetime.

4.4.4 Correction Wynd

Implementation

Lighting of the underpass and the surrounding area will focus on pedestrian scale, generate curiosity, and create a connection between the Kirk of St. Nicholas, Union street and the Green.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met

Activity	
PHASE 1	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Legal agreements with property owners	8 weeks
Appointment of project team	8 weeks
Site Surveys	8 weeks
Detailed design phase	8 weeks
Statutory Approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & Commission	8 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

PHASE 2	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Legal agreements with property owners	8 weeks
Appointment of project team	8 weeks
Site Surveys	8 weeks
Detailed design phase	8 weeks
Statutory Approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & Commission	4 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.
5. Phasing has been implemented by ACC to align to funding availability, it is anticipated each phase will be implemented within different financial years.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of in ground linear uplights, in ground paver marker lights & linear grazers to a listed underpass. Costs exclude infrastructure works, landscaping works & value added tax				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	111,800	111,800
	Cabling Works	1	Item	62,000	62,000
	Associated Architectural / Structural Works	1	Item	80,000	80,000
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**254,000**
	Development Cost Allowance For Implementation Costs (Capital Costs)	1	Item	222,700	222,700
	Additional Elements Implementation Costs (Capital Costs)				
	Staircase Lighting Including All Associated Works	1	Item	38,100	38,100
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**39,000**
	Development Cost Allowance for Additional Elements Implementation Costs (Capital Costs)	1	Item	33,400	33,400

TOTAL	550,000

Considerations

- The works shall be carried out in line with conservation best practice and utilising the pavements for services routes

Funding opportunities

- Aberdeen Inspired
- Creative Scotland
- Aberdeen City Council capital budget and /or Growth Accelerator

Maintenance

The Correction Wynd installation shall be maintained by Aberdeen City Council.

Durability of luminaires shall be considered in conjunction with the maintenance strategy.

The above capital cost allows for spare luminaires. It is recognised that there will be an increased in maintenance costs when compared to the current installation. This should be minimised by the selecting luminaires with a long life time and that are easy to access.

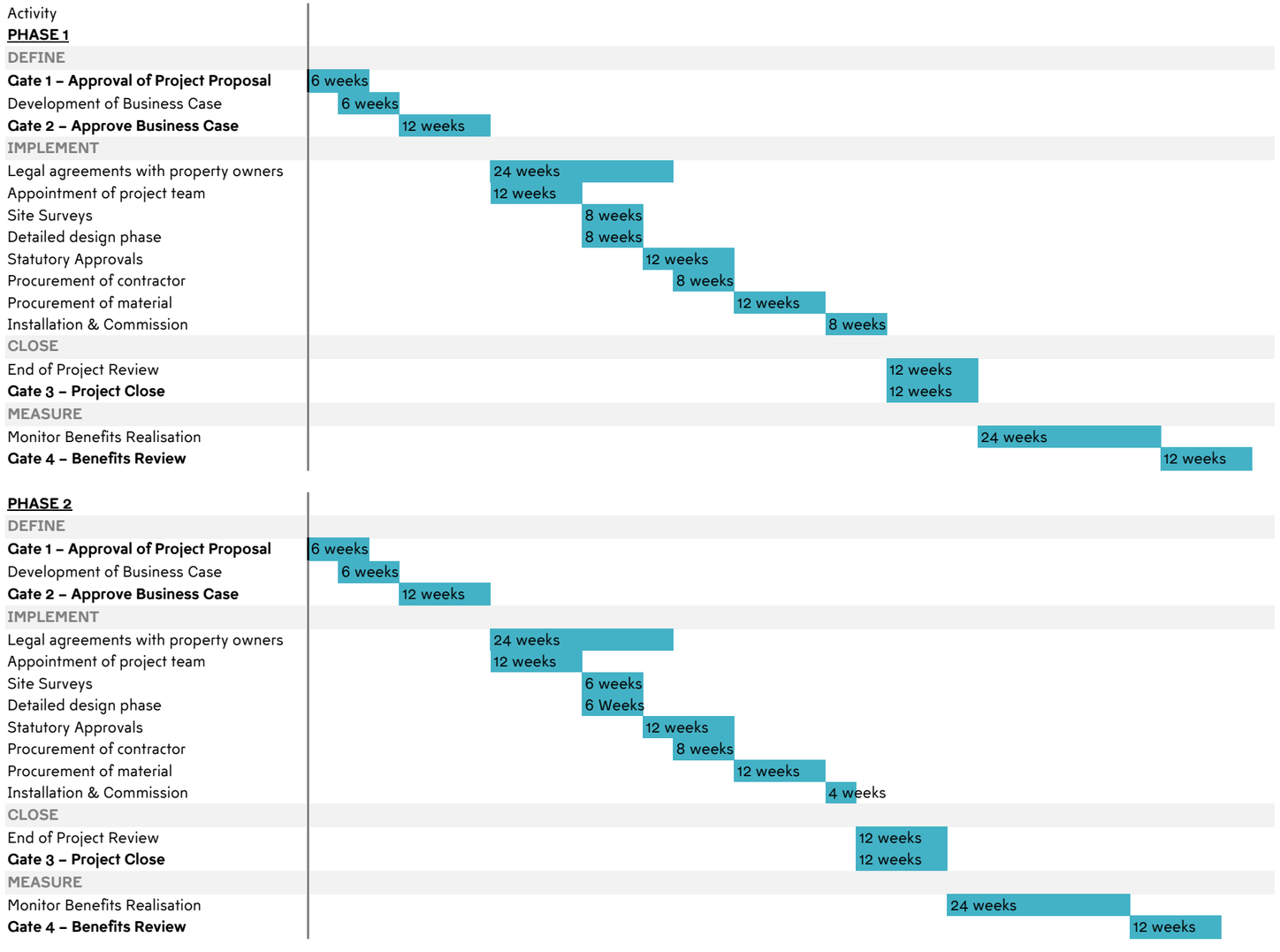
4.4.5 Golden Square

Implementation

Projections and tree uplighting in conjunction with seating zones and sound scape will create ambiance and an environment that appeals to the senses.

Interdependencies

- Planning consent to be acquired
- Public realm design is being planned for the Square



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.
5. Phasing has been implemented by ACC to align to funding availability, it is anticipated each phase will be implemented within different financial years.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of pole mounted speakers, projectors & luminaires and in ground uplighters. Costs exclude infrastructure works, landscaping works & value added tax. It has been assumed that wiring for the tree & statue uplights can be reused from existing and only require new terminations.				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	70,500	70,500
	Cabling Works	1	Item	30,100	30,100
	Associated Architectural / Structural Works	1	Item	20,800	20,800
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**122,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	97,700	97,700
	Additional Elements Implementation Costs (Capital Costs)				
	Bench Lighting Including All Associated Works	1	Item	104,100	104,100
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**105,000**
	Development Cost Allowance for Additional Elements Implementation Costs (Capital Costs)	1	Item	83,900	83,900

TOTAL	409,000

Considerations

- Existing lighting infrastructure shall be used
- The creative lighting scheme is to be integrated in the public realm proposal
- The capital costs provided in the adjacent table include the permanent facade lighting of the music hall but exclude the cost of two temporary facade lighting installations (£ 88,000). Aberdeen City Council will provide 50% of the total cost of these temporary installations. (£ 44,000)

Funding opportunities

- Opp North East Local growth fund (improve economy, specialised innovation within urban space)
- Aberdeen City Council capital budget and /or Growth Accelerator
- Aberdeen Performing Arts (APA)

Maintenance

The Golden Square installation shall be maintained by Aberdeen City Council and considered as part of the public realm enhancement to the square. Discussions with APA shall be held to ensure commitment to the maintenance of the music hall.

Lighting hardware selection shall consider the maximum possible lifetime.

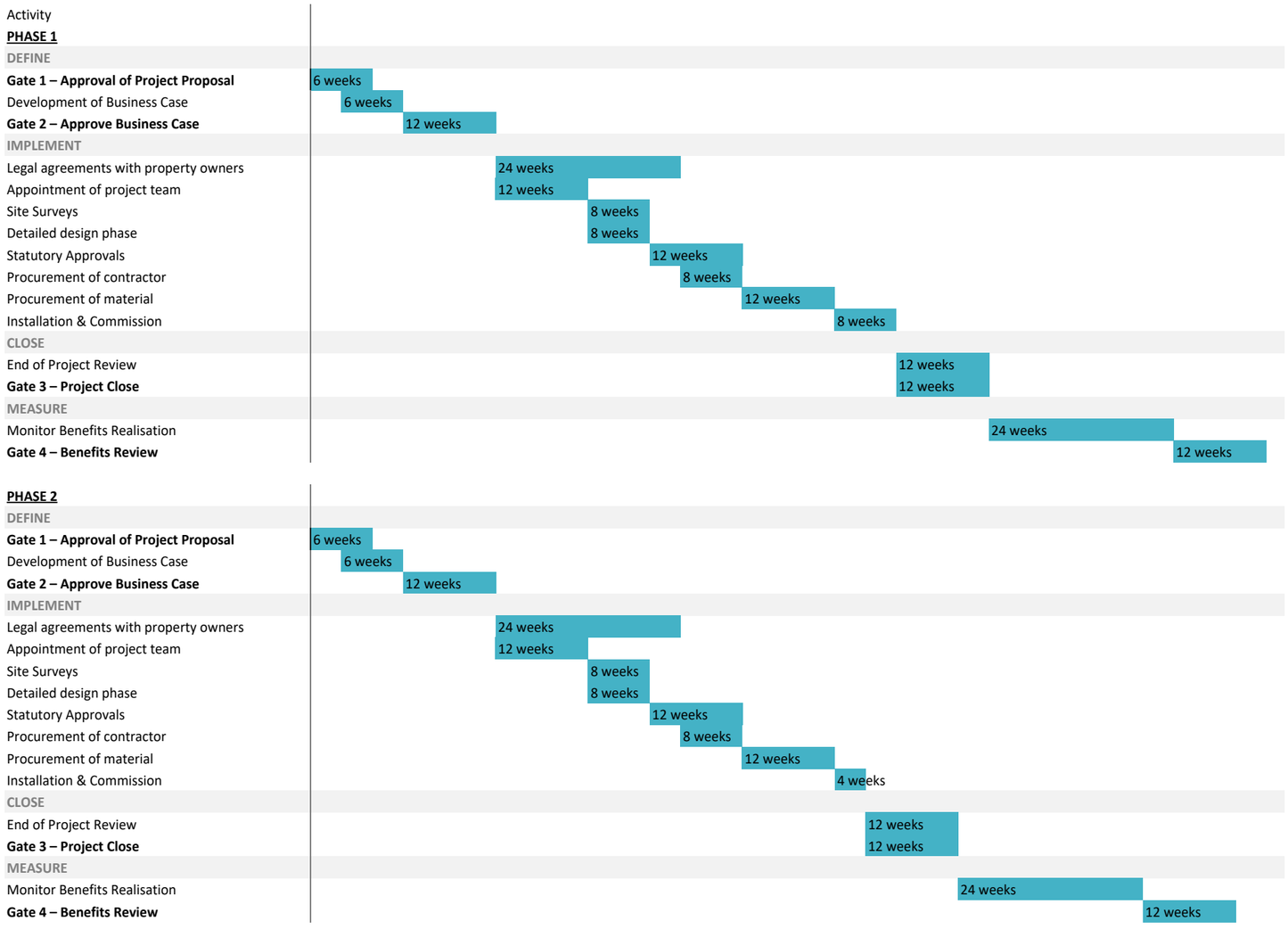
4.4.6 Castlegate

Implementation

The lighting scheme at Castlegate will create ambiance providing a place for people to stay and interact. The architectural backdrop is integrated in the night time experience of the square.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
3. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.
4. Phasing has been implemented by ACC to align to funding availability, it is anticipated each phase will be implemented within different financial years.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of pole mounted speakers, projectors & luminaires and in ground uplighters. Costs exclude infrastructure works, landscaping works & value added tax. It has been assumed that wiring for the tree & statue uplights can be reused from existing and only require new terminations.				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	77,900	77,900
	Cabling Works	1	Item	42,200	42,200
	Associated Architectural / Structural Works	1	Item	51,500	51,500
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	172,000
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	150,600	150,600
	Additional Elements Implementation Costs (Capital Costs)				
	Bench Lighting Including All Associated Works	1	Item	74,300	74,300
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	75,000
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	65,200	65,200
				TOTAL	463,000

Considerations

- Works shall be carried out in line with conservation best practice

Funding opportunities

- Opp North East Local growth fund (improve economy, specialised innovation within urban space)
- Heritage Lottery Fund (uplighting to the churches)
- Aberdeen Inspired
- Aberdeen City Council capital budget and /or Growth Accelerator

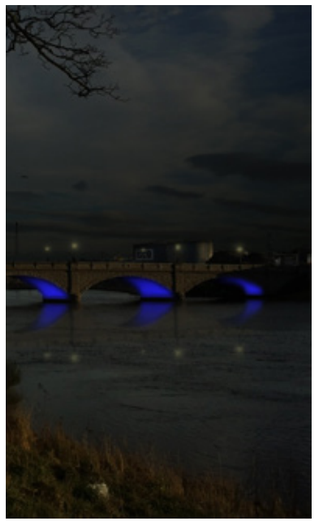
Maintenance

Maintenance responsibilities of the Castlegate installation could be as follows:
- Pole and bench lighting by Aberdeen City Council
- Facade lighting by the building owners

The lifetime of the temporary installation shall be identified and accounted for in the maintenance strategy.

The design shall aim to achieve a nil net increase in maintenance costs of the pole and bench lighting when compared to the current street lighting installation.

4.4.7 Wellington and Victoria Bridges



Activity	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Appointment of project team	12 weeks
Site Surveys	8 weeks
Detailed design phase	12 weeks
Statutory Approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & Commission	16 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

Implementation

In conjunction with the riverbanks lighting of the bridges will encourage people to walk by the river, making the waterside part of the City Centre. Surprising vistas are provided from the bridges to the riverbanks and vice versa.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met
- Environmental impact associated with biodiversity to be assessed

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works				
	The supply & installation of lighting above the Wellington Bridge & below the Victoria Bridge.				
	Costs exclude infrastructure works, landscaping works & value added tax.				
	Information Used				
	Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	206,000	206,000
	Cabling Works	1	Item	43,100	43,100
	Associated Architectural / Structural Works	1	Item	58,000	58,000
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**308,000**
	Development Cost Allowance For Implementation Costs (Capital Costs)	1	Item	325,100	325,100

TOTAL	634,000

Considerations

- Environmental conditions
- Existing lighting infrastructure shall be utilised
- Works shall be carried out in line with conservation best practice

Funding opportunities

- Heritage Lottery Fund
- Creative Scotland
- Common Good Fund
- Aberdeen City Council capital budget and /or Growth Accelerator

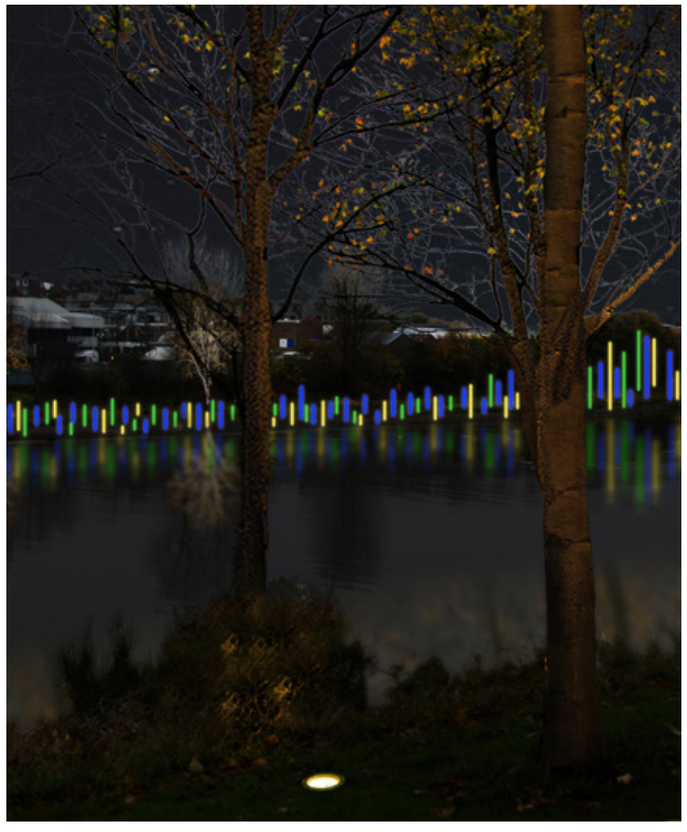
Maintenance

Maintenance responsibilities of the installation could be as follows:
- Wellington Bridge by the City Council
- Victoria Bridge by Aberdeen City Council

The maintenance strategy shall consider health and safety issues. Lighting hardware selection shall consider the maximum possible lifetime.

The design of Wellington Bridge shall aim to achieve a nil net increase in maintenance costs. It is recognised that the maintenance of Victoria Bridge can be considerable due to the environmental conditions.

4.4.8 Riverbanks



Implementation

Light art and tree uplighting along the river Dee will draw people to the waterfront creating a new night time destination.

Interdependencies

- Permission from Aberdeen Harbour Board to be acquired
- Environmental impact associated with biodiversity to be assessed

North Riverbank

Activity	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Appointment of project team	8 weeks
Site Surveys	4 weeks
Detailed design phase	8 weeks
Statutory approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & commission	4 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

Points of note

1. Legal agreements may be required due to interphases with private properties.
2. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
3. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

South Riverbank

Activity	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Appointment of project team	12 weeks
Site Surveys	8 weeks
Local artist engagement	8 weeks
Detailed design phase	16 weeks
Statutory approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & commission	16 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

Points of note

1. Legal agreements may be required due to interphases with private properties.
2. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
3. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

Cost

North Riverbank

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of lighting along the north riverbank. Costs exclude landscaping works & value added tax. Information Used Base unit rates that the indicative costs have been calculated with. Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	28,000	28,000
	Cabling Works	1	Item	18,800	18,800
	Associated Architectural / Structural Works	1	Item	37,500	37,500
	Infrastructure Works	1	Item	-	-
				Rounded Total	85,000
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	88,400	88,400

TOTAL	174,000

South Riverbank

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of lighting along the south riverbank. Costs exclude landscaping works & value added tax. Information Used Base unit rates that the indicative costs have been calculated with. Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	152,300	152,300
	Cabling Works	1	Item	82,300	82,300
	Associated Architectural / Structural Works	1	Item	107,500	107,500
	Infrastructure Works	1	Item	100,000	100,000
				Rounded Total	443,000
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	468,000	468,000

TOTAL	911,000

Considerations
- New infrastructure to lighting on the South riverbank
- Environmental conditions
- A selected section of the waterfront shall be prioritised together with the commissioned artist

Funding opportunities
- Creative Scotland
- Common Good Fund
- S75 developer contributions
- Aberdeen City Council capital budget and /or Growth Accelerator

Maintenance

Maintenance responsibilities of the installation shall be as follows:
- North Riverbank tree up lighting by Aberdeen City Council with the estimated maintenance expenditure capitalised
- South Riverbank by management company for the new development planned for the Torry area

The maintenance strategy shall consider health and safety issues.

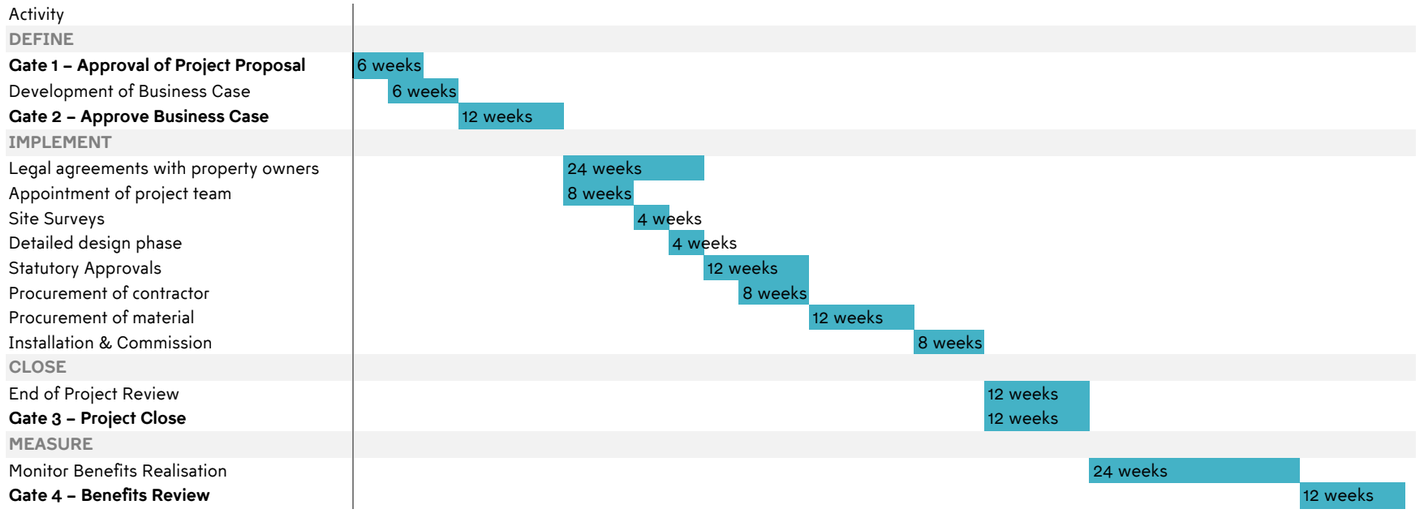
4.4.9 The Kirk of St. Nicholas

Implementation

Façade lighting to the Kirk of St Nicholas to reveal the architectural legacy and the Aberdeen City skyline in their best light against the night sky. The project will assist with stimulating interest and create a welcoming city with a cultural backdrop, which is part of Aberdeen's identity.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met
- Permission from Church of Scotland to be acquired



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
3. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works				
	The supply & installation of lighting both internally & externally to illuminate The Kirk of St. Nicholas Uniting. Costs exclude infrastructure works, landscaping works & value added tax.				
	Information Used				
	Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	55,000	55,000
	Cabling Works	1	Item	41,100	41,100
	Associated Architectural / Structural Works	1	Item	41,500	41,500
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**138,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	119,500	119,500

TOTAL	258,000

Considerations

- Fixings onto grade A listed building - works shall be carried out in line with conservation best practice
- The lighting is to be fed through the electrical systems of the church

Funding opportunities

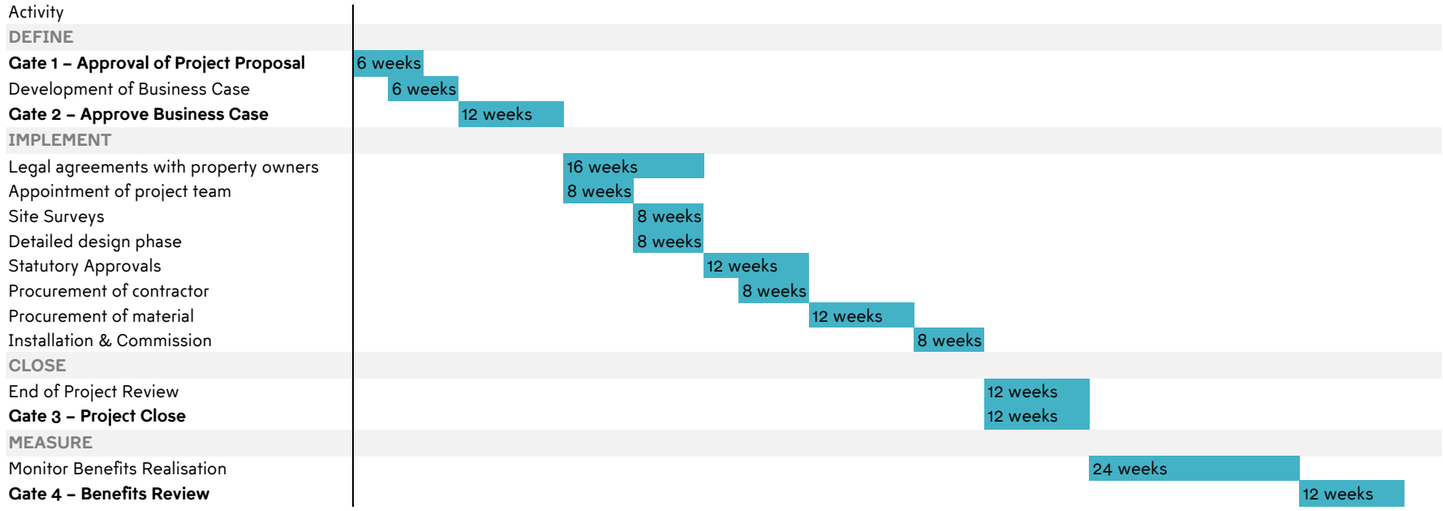
- Aberdeen Inspired
- Heritage Lottery Fund
- Common Good Fund
- Crowd funding/ External fundraising
- Church of Scotland
- Aberdeen City Council capital budget and /or Growth Accelerator

Maintenance

The lighting installation could be maintained by the Church of Scotland.

The maintenance strategy shall consider health and safety issues. Lighting hardware selection shall consider the maximum possible lifetime and luminaire drivers shall be positioned internally to minimise maintenance and replacement requirements.

4.4.10 The Green



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, diversions or connection works due to unknown scope.

Implementation

The green will be activated through the provision of a dynamic and lively environment, supporting the night time economy. General and ambient lighting at the Green will increase comfort and sense of security.

Interdependencies

- Planning consent to be acquired
- There are proposals for the Market building to be opened up and extend onto the Green

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works				
	The supply & installation of up-lighting to trees, pole mounted luminaires, wall washers & projectors to murals. Costs exclude infrastructure works, landscaping works & value added tax.				
	Information Used				
	Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	124,200	124,200
	Cabling Works	1	Item	38,800	38,800
	Associated Architectural / Structural Works	1	Item	19,000	19,000
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**182,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	144,200	144,200

TOTAL	327,000

Considerations

- Works shall be carried out in line with conservation best practice
- Annual projections programme shall be defined with the local community such as schools and artists
- Existing infrastructure shall be utilised

Funding opportunities

- Opp North East Local growth fund (improve economy, specialised innovation within urban space)
- Aberdeen Inspired
- Aberdeen City Council capital budgets and/or Growth Accelerator

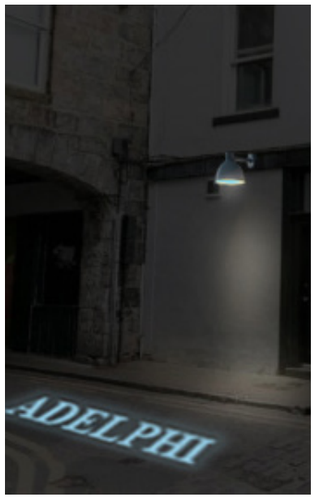
Maintenance

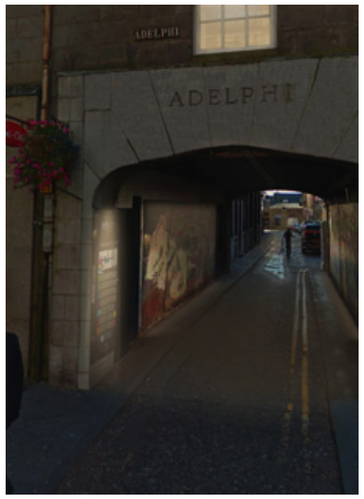
The installation for The Green shall be maintained by Aberdeen City Council.

Lighting hardware selection shall consider the maximum possible lifetime.

The design shall aim to achieve a nil net increase in maintenance costs of the proposed system when compared to the current street lighting installation.

4.4.11 Adelphi Lane



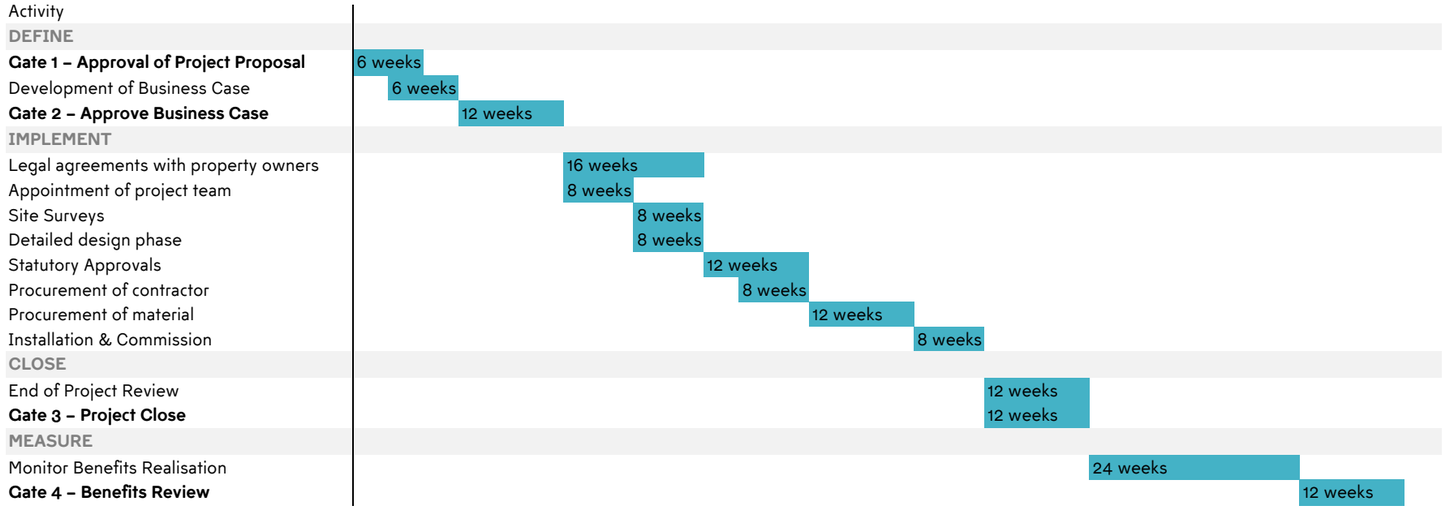


Implementation

The mural lighting, signage lighting and lantern replacement at Adelphi Lane focuses on pedestrian scale and expresses the character of the laneways at night, giving them a unique personality.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met



Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, direvsions or connection works due to unkown scope.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works				
	The supply & installation of wall washers, spotlights, lanterns & a projector to Adelphi Lane.				
	Costs exclude infrastructure works, landscaping works & value added tax.				
	Information Used				
	Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	45,000	45,000
	Cabling Works	1	Item	12,600	12,600
	Associated Architectural / Structural Works	1	Item	10,000	10,000
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**68,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	58,800	58,800

TOTAL	127,000

Considerations

- Works shall be carried out in line with conservation best practice
- Existing infrastructure shall be utilised

Funding opportunities

- Common Good Fund
- S75 developer contributions
- Aberdeen City Council's Capital budget and/or Growth Accelerator

Maintenance

The lighting for Adelphi and Adelphi Lane shall be maintained by Aberdeen City Council.

Lighting hardware selection shall consider the maximum possible lifetime.

The design shall aim to achieve a nil net increase in maintenance costs when compared to the current street lighting installation.

4.4.12 Donald's Way

Implementation

The lighting scheme will instil fun and curiosity, encouraging pedestrians to use this connection at night, same as one would during the day. Lighting reinforces the spatial qualities of this connection and makes the staircase a destination point.

Interdependencies

- Planning consent to be acquired
- Conservation area and listed building requirements to be met
- Permission from Church of Scotland to be acquired

Activity	
DEFINE	
Gate 1 – Approval of Project Proposal	6 weeks
Development of Business Case	6 weeks
Gate 2 – Approve Business Case	12 weeks
IMPLEMENT	
Legal agreements with property owners	24 weeks
Appointment of project team	8 weeks
Site Surveys	8 weeks
Detailed design phase	8 weeks
Engagement with local schools	4 weeks
Statutory Approvals	12 weeks
Procurement of contractor	8 weeks
Procurement of material	12 weeks
Installation & Commission	8 weeks
CLOSE	
End of Project Review	12 weeks
Gate 3 – Project Close	12 weeks
MEASURE	
Monitor Benefits Realisation	24 weeks
Gate 4 – Benefits Review	12 weeks

Points of note

1. Legal agreements may be required due to interphases with private properties.
2. As part of the installation phase, road closures may be required, as such phasing may impact on durations.
3. Durations are based on project team experience and will be subject to review and agreement with individual project teams and contractors.
4. Programme makes no allowance for utility upgrade, direvsions or connection works due to unkown scope.

Cost

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Scope of Works The supply & installation of light blade effect luminaire, lighting integrated into handrails & linear lighting to staircase in Donald's Way. Costs exclude infrastructure works, landscaping works & value added tax.				
	Information Used Base unit rates that the indicative costs have been calculated with.				
	Implementation Costs (Capital Costs)				
	Luminaires, Supply & Install	1	Item	51,600	51,600
	Cabling Works	1	Item	6,700	6,700
	Associated Architectural / Structural Works	1	Item	12,500	12,500
	Infrastructure Works	1	Item	Excluded	Excluded
				Rounded Total	**71,000**
	Development Cost Allowance for Implementation Costs (Capital Costs)	1	Item	68,200	68,200

TOTAL	140,000

Considerations

- Works shall be carried out in line with conservation best practice
- Listed building consent is required
- Existing lighting infrastructure shall be utilised

Funding opportunities

- Aberdeen Inspired
- Creative Scotland
- Common Good Fund
- Aberdeen City Council capital budget and /or Growth Accelerator

Maintenance

The lighting for Donald's way shall be maintained by Aberdeen City Council.

Lighting hardware selection shall consider the maximum possible lifetime.

The design shall aim to achieve a nil net increase in maintenance costs when compared to the current street lighting installation.

4.5 Prioritisation

The projects have been prioritised as shown in the adjacent table based on the following:

- Objectives addressed
- Cost
- Available funding
- Project input
- Interdependencies

This order informs the indicative five year implementation programme described earlier.

Priority	Project		Achieved Objectives	cost	Interdependencies
1	3.5.6	Castlegate Phase 1	E, T, D, C	£ 322,600	•Planning consent to be acquired •Conservation area and listed building requirements to be met
2	3.5.9	Kirk of St Nicholas	E, T, U, D, C	£ 257,500	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Permission from Church of Scotland to be acquired
3	3.5.11	Adelphi Lane	E, T, U, D, C	£ 126,800	•Planning consent to be acquired •Conservation area and listed building requirements to be met
4	3.5.3	Langstane Place	E, U, D, C	£ 178,900	•Planning consent to be acquired •Engagement with building owners to obtain permission for the scheme
5	3.5.12	Donald's Way	T, U, D, C	£ 139,200	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Permission from Church of Scotland to be acquired
6	3.5.1	Union St Phase 1	E, T, U, D, C	£ 827,900	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Co-ordination in implementation with public realm scheme for Union Street
7	3.5.10	The Green	E, T, U, D, C	£ 326,200	•Planning consent to be acquired •There are proposals for the Market building to be opened up and extend onto the Green
8	3.5.4	Correction Wynd Phase 1	T, U, D, C	£ 476,700	•Planning consent to be acquired •Conservation area and listed building requirements to be met
9	3.5.4	Correction Wynd Phase 2	T, U, D, C	£ 72,400	•Planning consent to be acquired •Conservation area and listed building requirements to be met
10	3.5.2	Belmont St Phase 1	E, U, D, C	£ 769,600	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Consent and commitment of local businesses
11	3.5.2	Belmont St Phase 2	E, U, D, C	£ 114,100	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Consent and commitment of local businesses
12	3.5.8	Riverbanks Phase 1	U, D, C, W	£ 173,400	•Permission from Aberdeen Harbour Board to be acquired •Environmental impact associated with biodiversity to be assessed
13	3.5.1	Union St Phase 2	E, T, U, D, C	£ 475,000	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Co-ordination in implementation with public realm scheme for Union Street
14	3.5.6	Castle Gate Phase 2	E, T, D, C	£ 140,200	•Planning consent to be acquired •Conservation area and listed building requirements to be met
15	3.5.5	Golden Square Phase 1	E, T, D, C	£ 219,000	•Planning consent to be acquired •Public realm design is being planned for the squareProject
16	3.5.5	Golden Square Phase 2	E, T, D, C	£ 219,000	•Planning consent to be acquired •Public realm design is being planned for the squareProject
17	3.5.7	Wellington and Victoria bridges	U, D, C, W	£ 633,100	•Planning consent to be acquired •Conservation area and listed building requirements to be met •Environmental impact associated with biodiversity to be assessed
18	3.5.8	Riverbanks Phase 2	U, D, C, W	£ 911,000	•Permission from Aberdeen Harbour Board to be acquired •Environmental impact associated with biodiversity to be assessed
			TOTAL COST	£ 6,382,600	

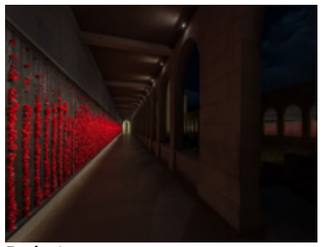
Glossary

Accent	Where light is used to emphasise or highlight objects.
Beam distribution	The spread of light emitted from a luminaire, where the beam angle is in degrees.
Brightness (luminance)	The physical quantity corresponding to the brightness of a surface in a specified direction. Unit: cd/m^2
Colour temperature	A numerical value to the colour emitted by a light source, measured in degrees of Kelvin.
Colour rendering index (CRI)	The effect of a light source on the colour appearance of an object, stated as Ra value.
Correlated colour temperature (CCT)	The absolute temperature of a black body radiator whose chromaticity most nearly resembles that of the light source being considered. Unit: Kelvin.
Curfew	The time after which stricter requirements (for the control of obtrusive light) will apply.
Efficacy	A factor which quantifies the effectiveness of a luminaire in converting electrical power to light.
Environmental zone	Environmental zones (E1 to E4) stated within local planning authorities development plans for exterior lighting control.
Glare	The discomfort or impairment of vision experienced when parts of the field of view are excessively bright.
Gobo projection	A gobo is a stencil or template placed inside or in front of a light source to control the shape of the emitted light.
IK rating	Defines levels of protection by enclosures for electrical equipment against external mechanical impacts
IP rating	Defines levels of sealing effectiveness of electrical enclosures against intrusion from foreign bodies (tools, dirt etc.), moisture, and water
Lamp	Complete light source unit.
Light Level (illuminance)	The luminous flux arriving at a surface divided by the area of the illuminated surface. Unit: lux
Luminaire	Complete lighting units consisting of lamp, control gear (if required), reflector and housing.
Lumen	Unit of luminous flux used to describe a quantity of light emitted by a source or received by a surface. Unit: lumens
Obtrusive light	A form of pollution that can be substantially reduced without detriment to the lighting task.
Shield	Mechanical baffle attached to luminaire to prevent glare in a particular direction.
Strobing	Light effect where there are regular flashes of light
Surface reflectance	Reflectance of the surface of a material is its effectiveness in reflecting light. It is the fraction of incident electromagnetic power that is reflected at an interface.
Watt	Unit of electrical power

Image appendix

Project: Union Terrace Gardens, Aberdeen, UK
Reference: UTG planning application

Project: Aberdeen Art Gallery, Aberdeen
Reference: AAG planning application



Project: Australian War Memorial, Canberra
Reference: www.steensenvarming.com/projects

Project: **London urban realm project**
Reference: **www.i.pinimg.com**

Project: Augmenting Spatiality', Abercrombie Lane, Sydney
Reference: www.innovativerigging.com.au/portfolio-type/augmenting-spatiality-abercrombie-lane-sydney/

Project: Duke of York Chelsea, London, UK
Reference: http://www.fleagor.com/landscape-lighting-design-guide/guide-of-yorkus-square-chelsea-lighting-design-by-dpa-outdoor-guide-amazing-bedroom-living-room-outdoor-landscape-lighting-design-guide-lighting-design/

Project: Triple Kirk, Aberdeen, UK
Reference: Triple Kirk planning application

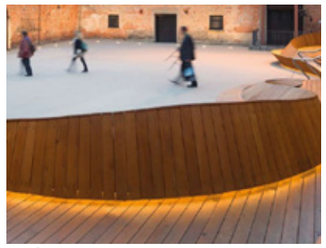
Project: Marischal College, Aberdeen, **UK**
Reference: Atelier 10 concept document

Project: Piano installation, Sydney
Reference: Steensen Varming inhouse photography

Project: Let There be Light, Londonderry, Ireland
Reference: www.belfasttelegraph.co.uk/news/northern-ireland/let-there-be-light-800000-public-art-finally-shows-its-true-colours-29001989.html

Project: Frederiksberg New Urban Spaces
Reference: www.afconsult.com/lighting?project=frederiksberg-new-urban-spaces-3

Project: Gladsville Bridge, Sydney, Australia
Reference: www. www.xenian.com.au/photogallery/gladesvillebridge.html



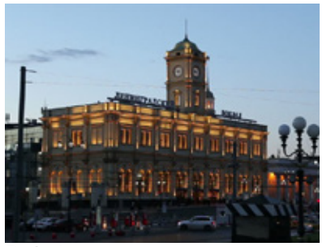
Project: Tasmanian Museum Art Gallery, Australia
Reference: www.steensenvarming.com/projects

Project: Utzon Centre, Aalborg, Denmark
Reference: http://www.steensenvarming.com/projects

Project: Duke of York Steps landscape design, London UK
Reference: www.darcawards.com/architectural/duke-of-york-uk

Project: Devonshire Square, London, UK
Reference: www.gettyimages.co.uk/license/144845325

Project: Walkway near Oceans Garden, Kobe, Japan
Reference: www.hei.at/en/projects/



Project: Leningrad Railway Station, Moscow
Reference: https://www.shutterstock.com/video/clip-11349143-stock-footage-moscow-circa-historic-building-of-the-leningradsky-railway-station-and-night-traffic-is.html?src=rel/23910475:3/3p

Project: Walkway near Oceans Garden, Kobe, Japan
Reference: www.hei.at/en/projects/

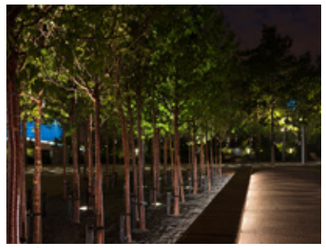
Project: University of Sydney campus, Australia
Reference: www.steensenvarming.com/projects

Project: Martin Place master plan, Sydney
Reference: www.steensenvarming.com/projects

Project: Chaumont Viaduct, Chaumont, France
Reference: www.iguzzini.fr

Project: Streetwalk, City of Sunderland, UK
Reference: www.contemporist.com/streetwalk-by-charlie-davidson/

Project: **Queen Elizabeth Park, London, UK**
Reference: **https://i.pinimg.com/originals/08/**



Project: **Queen Elizabeth Olympic Park, London**
Reference: www. darcawards.com/architectural/wp-content/uploads/sites/2/2016/04/Queen-Elizabeth-Olympic-Park_James-Newton_08.png

Project: Scott Monument, UK
Reference: www.darcawards.com

Project: Museo Madre Light Installation, Naples
Reference: https://www.pinterest.co.uk/pin/294071050652883270/

Project: KTH Square, Sweden
Reference:darcawards.com/architectural/kth-square-sweden/

Project: 'Under a Different Light', Thessaloniki, Greece
Reference: www.repubblica.it

Project: Holmbladsgade Urban Lighting, Copenhagen Denmark
Reference: inhouse image

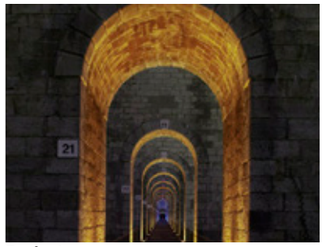
Project: **High Line, New York, USA**
Reference: www.photos.severinghaus.org/keyword/The%20High%20Line/i-nSXh4GC/A

Project: **Rust finish lamp shade**
Reference:www.pinterest.es/pin/770819292442286053/

Project: **Slingsby Place, London UK**
Reference: www.i.pinimg.com/originals/26/de/ee/26deee6ae009eb4fd0ac77998c21ad25.jpg

Project: Neri Lighting project, Verona, Italy
Reference:https://www.pinterest.com/pin/516084438525541664/

Project: Christmas Lighting Melbourne, Australia
Reference: https://www.ronstanindustrial.com



Project: Chaumont Viaduct, Chaumont, France
Reference: www.iguzzini.fr

Project: **Bankstown CBD Civic Precinct Lighting Masterplan Implementation**
Reference:http://www.steensenvarming.com/projects

Product: Toldbod 120 Duo-Pendelleuchte, Louis Poulsen
Reference:www.prediger.de

Product: A-Tube Nano
Reference: www.studioitaliadesign.com

Project: Queen Victoria building, Sydney
Reference:www.campervanfinder.com.au/queen-victoria-building/

Project: Walthamstow Wetlands
Reference: inhouse image

Project: Lights of Sakura-Zaka', Tokyo, Japan
Reference: www.english.chikada-design.com

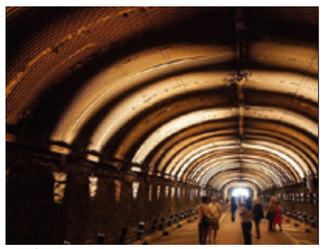
Project: In Lumine Tuo, Utrecht, Netherlands
Reference: www.images.adsttc.com

Product: **Soho lamp design**
Reference:www.marset.com/en/lamps/soho-outdoor/

Project: Regent Street, London, UK
Reference:www.jnphotographs.co.uk/gallery.php?introNo=4&catNo=12&gallNo=85

Project: Sainte-Agnès Church, Lac-Mégantic, Canada
Reference: journalmrg.com/un-eclairage-reussi/

Project: 'Under a Different Light', Thessaloniki, Greece
Reference:https://www.flickr.com/photos/sixtwelve/8263242633



Project: Park Avenue Tunnel, New York, USA
Reference: https://mymodernmet.com/rafael-lozano-hemmer-voice-tunnel-nyc/

Project: ZAC LA DUCHÈRE (GPV) - LYON
Reference: http://www.leseclairagistesassocies.com/realisation/lyon-la-duchere-grand-projet-de-ville

Project: GAMMEL HELLERUP GYMNASIUM
Reference: http://aasarchitecture.com/2013/08/multi-purpose-hall-for-the-gammel-hellerup-gymnasium-by-big.html

Project: Solvesborg Bridge, Sweden
Reference: www.designboom.com/architecture/ljusarkitektur-illuminates-glowing-solvesborg-bridge-in-sweden-12-16-2013/

Project: Light at Hermitage Museum and Gardens, Norfolk, USA
Reference: Unknown

Project: White Night Melbourne 2016
Reference: www.smh.com.au/entertainment/white-night-melbourne-2016-crowds-underwhelmed-by-allnight-arts-party-20160220-gmzdue.html

Project: Art in Berlin Germany
Reference: www.pinsdaddy.com

Project: Landscape Lighting Schemn, Verdensparken, Norway
Reference: www.darcawards.com/architectural/verdensparken-norway/

Product: PANCHETTO
Reference: www.luciferos.it

Project: Passerelle Marc Seguin, France
Reference: www.flux-lighting.com/en/module/realisations/display?id_realisation_type=34#realisation_fancy_94

Project: Strasbourg Cathedral, France
Reference:www.lightzoomlumiere.fr/realisation/cathedrale-de-strasbourg-techniques-dun-eclairage-innovant/

Product: UN by EWO
Reference:www.ewo.com/outdoor-lighting/lighting-systems-led/un

Project: Leake Street, London UK
Reference: www.designcurial.com

Project: **Bankstown Civic Precinct, Bankstown, Australia**
Reference:http://www.steensenvarming.com/projects

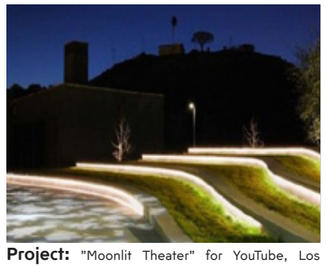
Product: iCuzzini Trick
Reference:https://www.pinterest.com/pin/826199494111555742/

Project: Quay Branly museum, Paris
Reference:http://www.panoramio.com/photo/32427372

Project: In Lumine Tuo, Utrecht, Netherlands
Reference: www.archlighting.com

Project: BRUNSWICK LANEWAY, Melbourne
Reference: www.theloop.com.au/DesignByKai/portfolio/brunswick-laneway-play/117510

Project: Alley in Venice
Reference: www.reddit.com



Project: "Moonlit Theater" for YouTube, Los Angeles, USA
Reference: http://oculuslightstudio.com/2013/moonlit-theater/

Project: Stone Arch Bridge, Minneapolis, USA
Reference: www.pinterest.com/pin/552605816750072849/

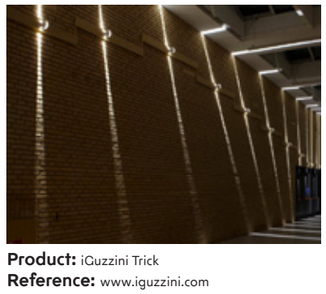
Project: : Field of Light at Simbionte, Mexico by Bruce Munro
Reference: http://www.brucemunro.co.uk/

Project: Strasbourg Cathedral, France
Reference:www.lightzoomlumiere.fr/realisation/cathedrale-de-strasbourg-techniques-dun-eclairage-innovant/

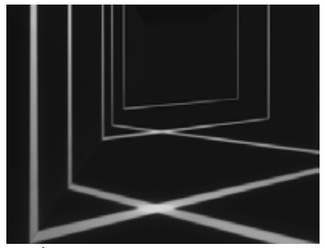
Product: TREILLE by Technilum
Reference:http://www.technilum.com/en/product/treille

Product: TOLDBOD
Reference: www.louispoulsen.com

Project: Coast Path Staircase, Plymouth, UK
Reference: www.archilovers.com/projects/92378/gallery?696052



Product: iGuzzini Trick
Reference: www.iguzzini.com



Product: iGuzzini Trick
Reference: www.iguzzini.com

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Reference: www.iguzzini.com