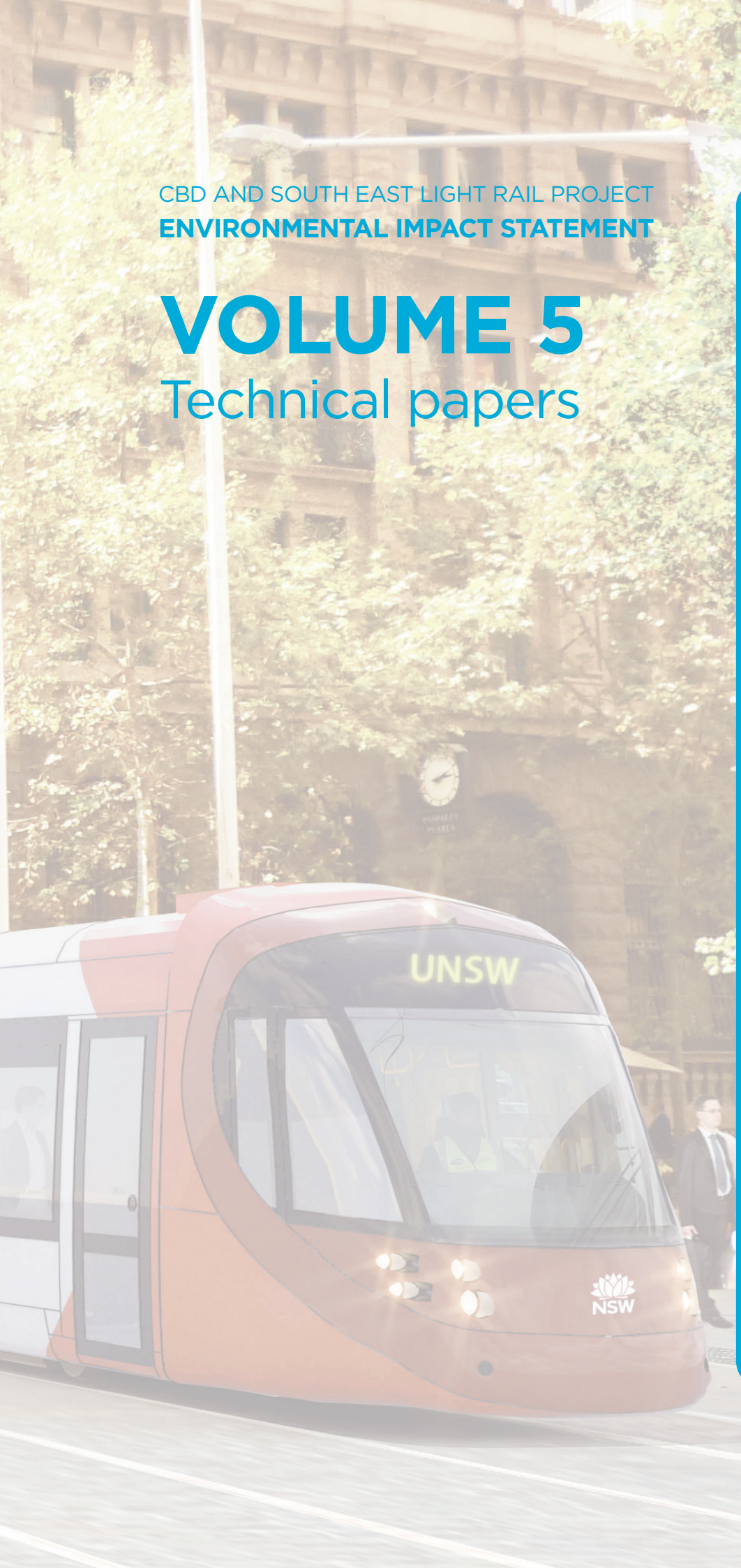
CBD AND SOUTH EAST LIGHT RAIL PROJECT

ENVIRONMENTAL IMPACT STATEMENT

VOLUME 5

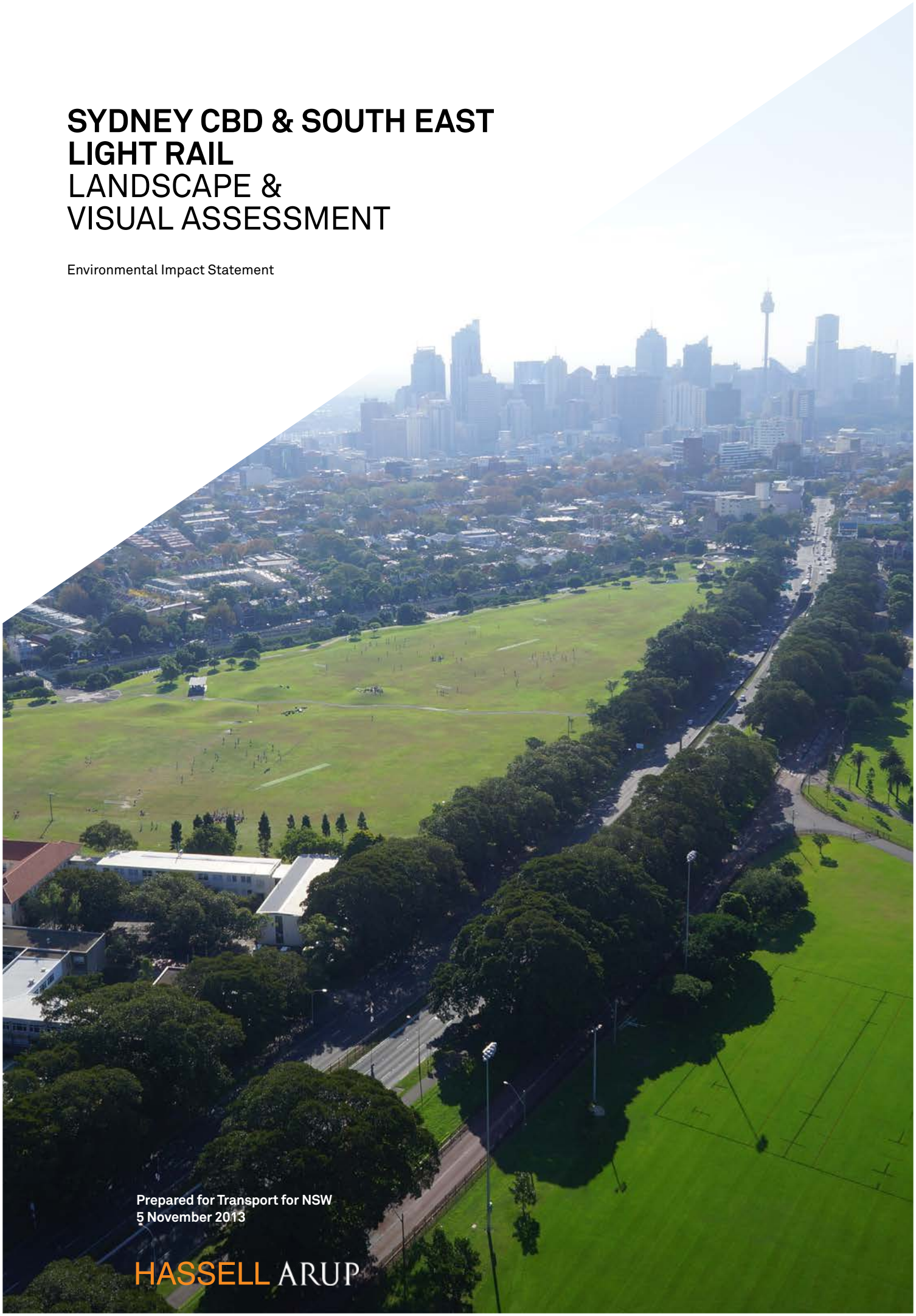
Technical papers



TECHNICAL PAPER 10: VISUAL AND LANDSCAPE ASSESSMENT

SYDNEY CBD & SOUTH EAST LIGHT RAIL
LANDSCAPE & VISUAL ASSESSMENT

Environmental Impact Statement



Prepared for Transport for NSW
5 November 2013

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Front cover image: Image of Moore Park
Photography by HASSELL

Report	Revision	Date
Sydney CBD & South East Light Rail VIA	Final	05.11.13

This report has been prepared by HASSELL and Arup, with an integrated team led by Daniel Bennett and project management by Suzanne Rawlinson. The design team included Anthony Charlesworth, Anthony Papas, Georgia Vitale, Ikumi Nakanishi, Claire Winsor, Susie Quinton, Evan Whiteside, Andrew Ness, and Wade Muller and the wider HASSELL and Arup design team.

We also acknowledge the inputs from Transport for NSW (Tim Green) and the lead consultant, Parsons Brinckerhoff (Hugh Swinbourne and Alex McDonald).

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Executive Summary

Image of Moore Park. Photography by HASSELL.

01

01 Executive Summary

1.0 Executive Summary

This Landscape and Visual Impact Assessment has been undertaken for the Sydney CBD and South East Light Rail (CSELR) proposal. It was commissioned by Parsons Brinkerhoff (on behalf of Transport for NSW) and undertaken by HASSELL and Arup. This report documents the assessment of the landscape and visual impacts of the project, including stops, interchanges, a maintenance facility and stabling yard. The assessment is based upon the current light rail design alignment as described in the project Environmental Impact Statement.

The assessment methodology follows current best practice as defined by the RMS Guidance Note EIA-N04 for Landscape Character and Visual Impact Assessment (2013), The Guidance for Landscape and Visual Impact Assessment (2013) and The US Forestry Service, Scenic Management System (1996). It includes:

- a review of the relevant planning context;
- an assessment of landscape features during construction and operation;
- a representative viewpoint assessment of day time impacts during construction and operation; and
- a general assessment of night time visual impacts.

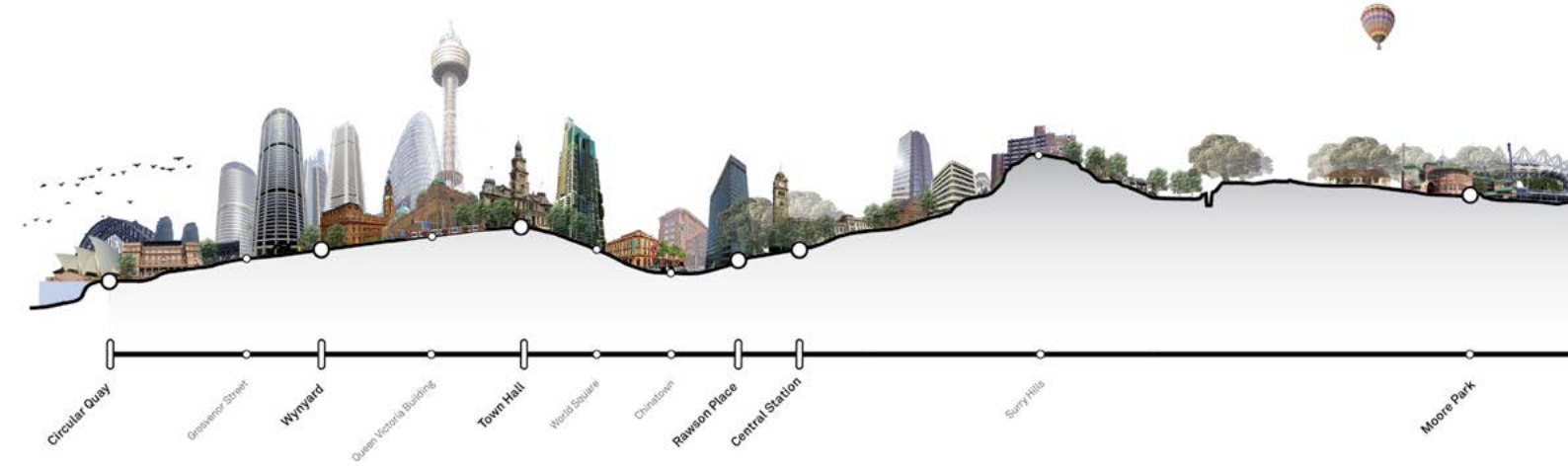
During construction, the CSELR would generally result in a predominantly adverse landscape and visual impact. This is owing to a range of direct and indirect physical impacts on the public realm, including reductions in pedestrian movement, legibility, visual connectivity and amenity, and significant tree loss.

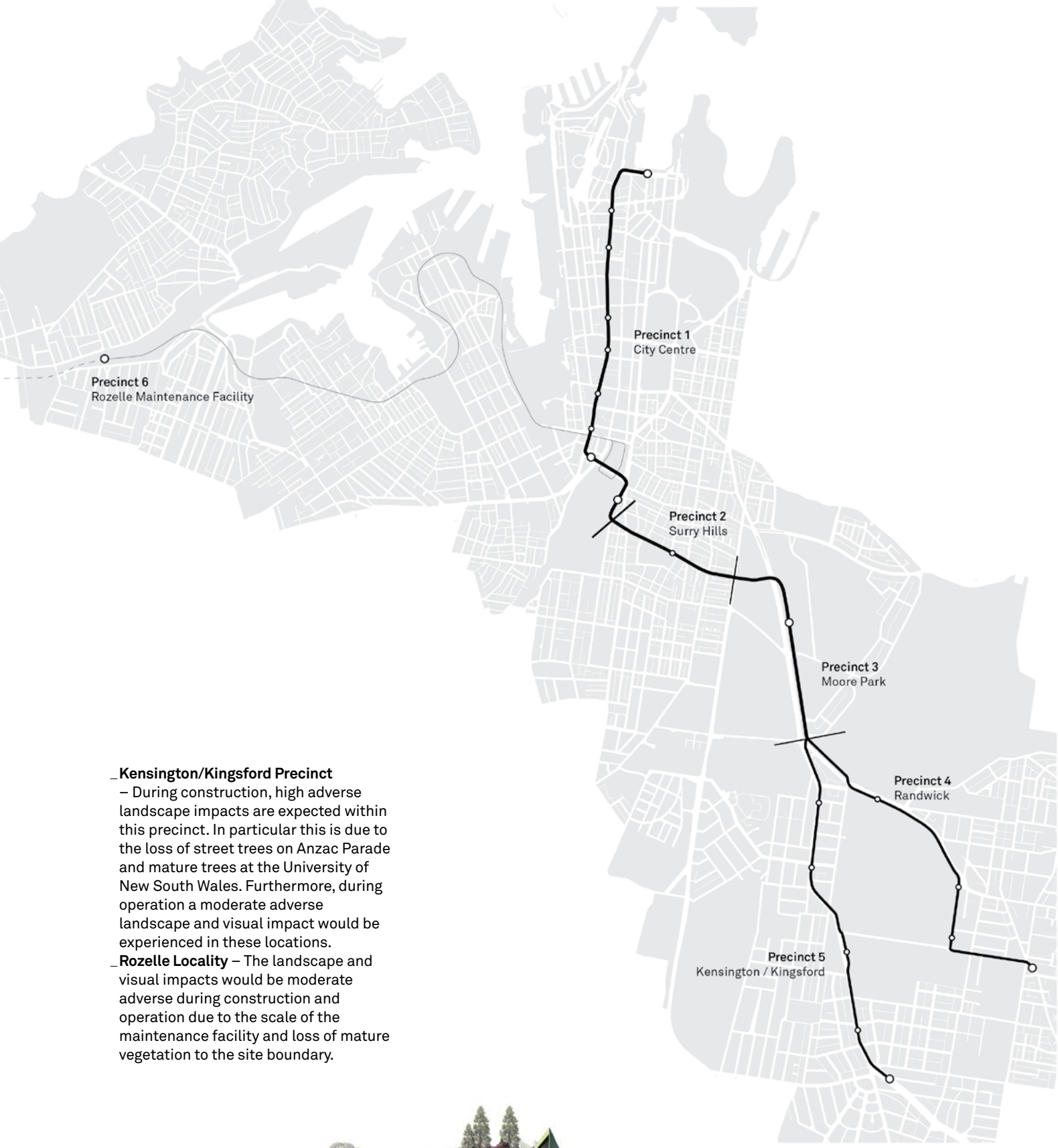
During operation, the CSELR would generally result in minor adverse to high beneficial impacts owing primarily to the compatibility between the light rail and existing character of the urban environment (and road network), its ability to visually absorb the proposed changes, and proposed improvements to the public realm.

At night the impacts are generally negligible as the alignment mainly follows existing roads where lit headlights from cars are currently seen and brighten the existing environment.

Significant landscape and visual character impacts include:

- **City Centre Precinct -** During construction there would be very high adverse landscape and visual impacts at First Fleet Park, Martin Place and Belmore Park due to the high sensitivity of these locations. These impacts are primarily derived from tree loss and the scale of the work sites. These impacts are temporary in nature, although their duration is prolonged (being between three and five years). During operation, significant landscape improvements would be experienced at Town Hall and St Andrews Cathedral Square owing to the pedestrianisation of George Street and public realm improvements. These changes are compatible with the City of Sydney's vision for George Street and future plans for an expanded square for Sydney's Town Hall. At Central Station, a high adverse landscape impact would be experienced at the Elizabeth Street Gardens which form a setting for the historic station bridges. These gardens would be directly impacted and no longer function as a park.
- **Surry Hills Precinct** – Landscape and visual impacts for this precinct are less than the City Centre Precinct owing to lower sensitivity levels of these locations. Nonetheless, moderate landscape impacts would occur along Devonshire Street during construction and operation. This is largely owing to the removal of the mature grouping of street trees which are fundamental to the character of the street; and direct impacts on Ward Park during construction, due to the loss of trees and reduced use and amenity of the park. Significant landscape improvements would occur through the revitalisation of the Wimbo and Ward Parks.
- **Moore Park Precinct** – The setting and parkland character of this precinct will be significantly impacted upon during construction owing to the removal of a number of mature fig trees, which are part of the significant avenue of trees on Anzac Parade, and the large scale of construction infrastructure introduced into the parkland. During operation, the effects of the removal of these trees would continue to be experienced, and the introduction of permanent infrastructure elements, such as the light rail stop, into the parkland setting would result in moderate adverse landscape and visual impacts.
- **Randwick Precinct –** The most noteworthy landscape impacts would occur at the Royal Randwick Racecourse as a result of the removal of a number of significant mature Fig trees and the loss of a substantial portion of High Cross Park to a transport interchange. During both construction and operation it is expected that there would be high adverse landscape and visual impacts experienced in these locations.





_**Kensington/Kingsford Precinct** – During construction, high adverse landscape impacts are expected within this precinct. In particular this is due to the loss of street trees on Anzac Parade and mature trees at the University of New South Wales. Furthermore, during operation a moderate adverse landscape and visual impact would be experienced in these locations.

_**Rozelle Locality** – The landscape and visual impacts would be moderate adverse during construction and operation due to the scale of the maintenance facility and loss of mature vegetation to the site boundary.

FINAL

01 Executive Summary

A summary of the assessment of the proposal is provided in the following table under six precincts.

	Construction	Operation Impact
City Centre Precinct		
Landscape Impacts	Moderate to very high adverse	Moderate adverse to very high beneficial
Visual Impacts (day)	High adverse to very high adverse	Negligible to very high beneficial
Visual Impacts (night)	Negligible	Negligible
Surry Hills Precinct		
Landscape Impacts	Negligible to moderate adverse	Minor adverse to minor beneficial
Visual Impacts (day)	Minor to high adverse	Negligible to moderate adverse
Visual Impacts (night)	Negligible to moderate adverse	Negligible to minor adverse
Moore Park Precinct		
Landscape Impacts	High adverse	Negligible to high moderate adverse
Visual Impacts (day)	High adverse	Moderate adverse
Visual Impacts (night)	Negligible	Negligible to minor adverse
Randwick Precinct		
Landscape Impacts	Minor to high adverse	Negligible to high adverse
Visual Impacts (day)	High adverse	Moderate to high adverse
Visual Impacts (night)	Negligible to moderate adverse	Negligible to minor adverse
Kensington / Kingsford Precinct		
Landscape Impacts	Minor to high adverse	Minor to moderate adverse
Visual Impacts (day)	Moderate to high adverse	Moderate adverse
Visual Impacts (night)	Negligible to minor adverse	Negligible to moderate adverse
Rozelle Locality		
Landscape Impacts	Moderate adverse	Minor adverse
Visual Impacts (day)	Moderate adverse	Moderate adverse
Visual Impacts (night)	Moderate adverse	Negligible

There is a considerable amount of mitigation inherent in the design of the alignment and high quality urban treatments that would be provided as a part of the proposal. The mitigation opportunities therefore focus primarily on opportunities to: reduce the landscape and visual impacts of construction; improve the landscape beneficial impacts of the proposal during operation; and to indirectly off-set the impacts of construction.

Mitigation measures have been identified both on and off site to avoid, reduce and manage potential adverse landscape and visual impacts during construction and operation of the proposal. They range from reducing light spill at construction sites to transformative public realm projects such as the creation of a new parks and plazas. The urban design strategy aims to respond to the diversity of the landscape through different light rail typologies, namely Civic, Park and Boulevard, and includes design principles for the public domain and stops.

Table 1-1 Summary of Assessment

Introduction

rial over Moore Park. Photography by HASSELL.

02

02 Introduction

2.0 Introduction

This report documents a landscape and visual assessment undertaken for the Sydney CBD and South East Light Rail (CSELR) proposal. This proposal includes 20 stops, interchanges, a maintenance facility and stabling yard. This assessment considers the current light rail design alignment as described in the project Environmental Impact Statement.

The proposal will be described and assessed in six broad precincts, these are:

- Precinct 1: City Centre
- Precinct 2: Surry Hills
- Precinct 3: Moore Park
- Precinct 4: Randwick
- Precinct 5: Kensington/Kingsford
- Precinct 6: Rozelle Locality

Proposed Precinct Zones

FINAL

02 Introduction

2.1 Guidance for Visual Impact Assessment

A range of guidance is available for the assessment of landscape and visual impact. In Australia, the industry typically refers to the guidance offered by:

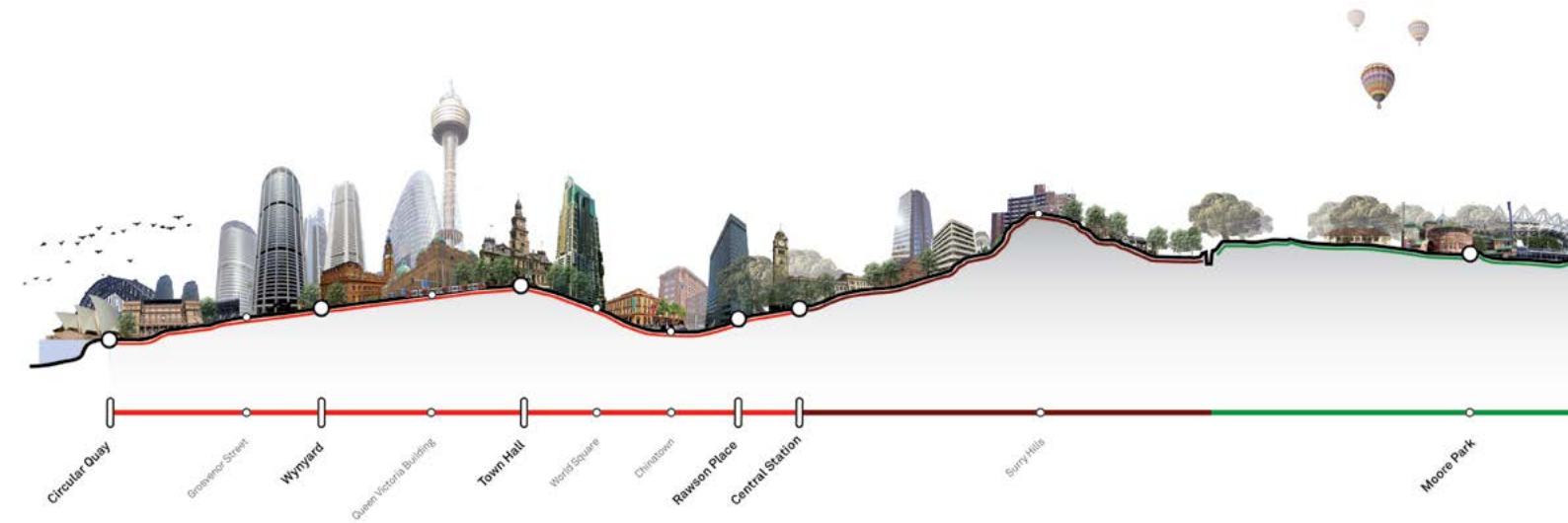
- RMS Guidance note *EIA-N04 Guidelines for Landscape Character and Visual Impact Assessment*, 2013;
- *The Guidance for Landscape and Visual Impact Assessment* (GLVIA), Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment, UK; and
- The US Forestry Service, Scenic Management System (SMS) as described in the publication *'Landscape Aesthetics: A Handbook of Scenery Management',* US Forestry Service, 1996.

The methodology used for this proposal is described in Section 3, and conforms generally with the direction offered by these documents.

2.2 Assumptions and Technical Limitations

The following technical limitations were experienced in the course of undertaking this study:

- The night time assessment is based on assumptions from daytime field work;
- Construction may occur 24 hours 7 days a week as required;
- An outline construction methodology was used for this assessment. It is expected that details of the timing and approach would be resolved in traffic and construction management plans;
- A number of site visits were undertaken during June and July of 2013, during which key landscape features and views were photographed. This assessment is based on the landscape and visual conditions at this time.



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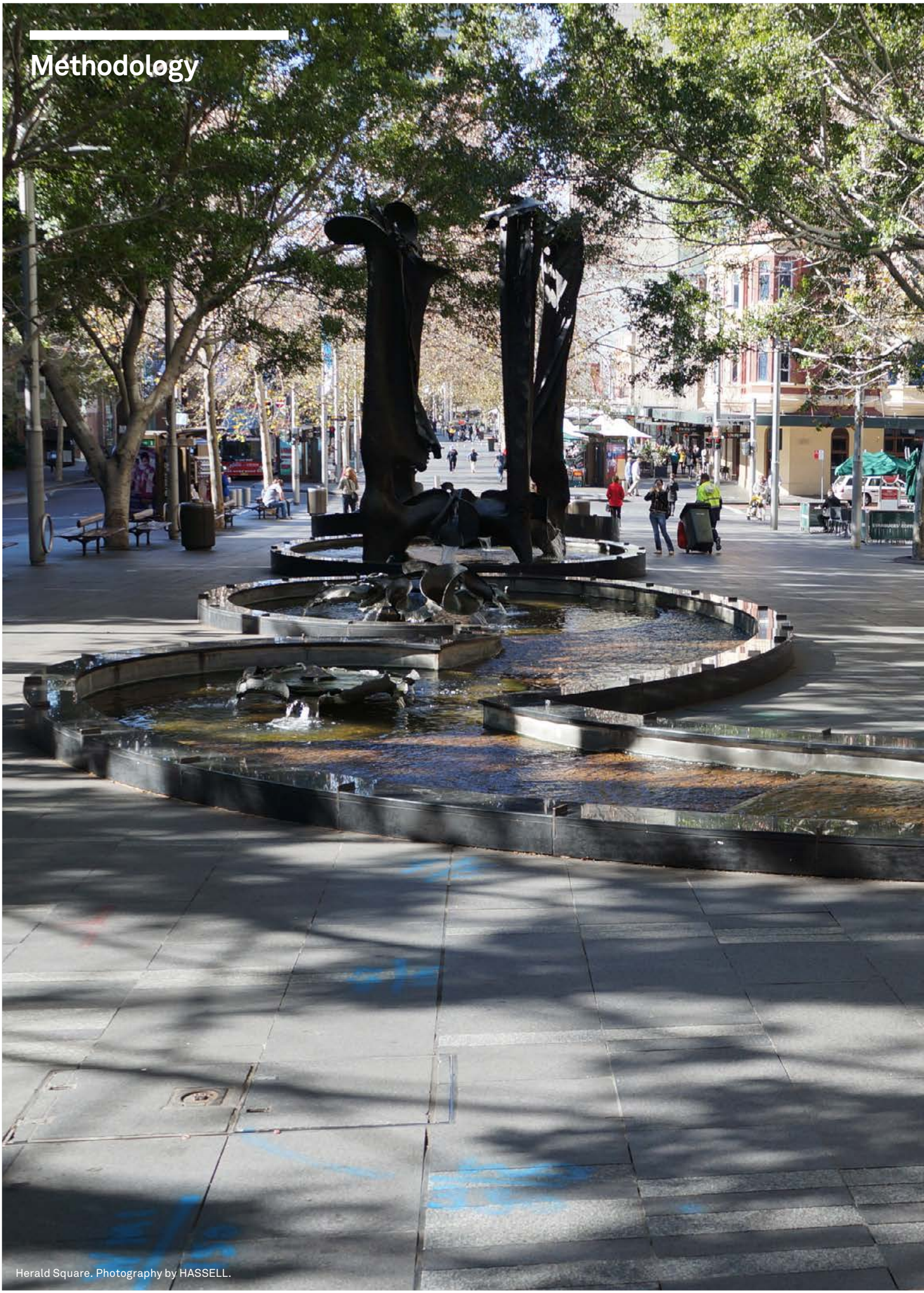
Methodology



Herald Square. Photography by HASSELL.

03

03 Methodology

The Landscape and Visual Impact Assessment considered each precinct separately, and included:

- A review of the relevant planning context.
- An assessment of landscape features during construction and operation.
- A representative viewpoint assessment of day time impacts during construction and operation.
- A general assessment of night time visual impacts.

3.1 Planning Context

There are International Agency, Federal, State and Local Government planning guidance relevant to the landscape and visual values of the precinct. Additionally, there are a number of master plans which have been prepared by government and private entities that identify the ambitions for particular key sites. These include site specific plans and precinct wide strategies and guidelines such as the City of Sydney's *George Street Master plan* and the *Central Station Strategy 2030.*

In the City Centre, Surry Hills and Moore Park precincts, the City of Sydney has the *Sydney Development Control Plan* (DCP) (2012) in place. The DCP identifies a number of Special Character Areas (SCA) which are based on the unique qualities of a particular nominated area of the city as defined by topography, setting, heritage, streetscape, landscape and built form. Accompanying these statements are a number of principles that have been devised to reinforce and enhance the setting of each area.

In the Randwick and Kensington / Kingsford precincts the Randwick City Council has the *Randwick Comprehensive Development Control Plan* (DCP) (2013). This document provides detailed planning and design controls and guidelines for heritage conservation areas and also identifies a number of sites and locations with specific planning requirements. The desired future character of specific sites and areas are outlined in the DCP as well as particular controls relating to view management and the public realm. In addition, some Heritage Conservation Area statements contained within the DCP include a discussion of the aesthetic significance of particular sites.

The Rozelle locality is subject to the *Leichhardt Development Control Plan* (DCP) (2001). This document identifies a number of distinctive neighbourhoods and defines the desired future character for the relevant area.

Within each precinct a brief description of each relevant policy, master plan or strategy is provided for consideration as part of the impact assessment.

3.2 Landscape Assessment

Landscape refers to the overall character and function of a place; it includes all elements within the public realm and the interrelationship between these elements.

In an urban environment there are a range of landscape elements that may be directly or indirectly impacted by the proposal. In order to identify these impacts, an assessment was undertaken by identifying the sensitivity of the element, magnitude of change expected as a result of the proposal, and then making an overall assessment of the impact on the landscape character of the precinct.

The elements that were assessed in each precinct include public plazas; parks; and streetscapes. Considerations include the functioning of footpaths; built edges; feature trees and avenues; visual and physical connections; and the types of activities supported in the public realm.

Landscape Sensitivity
The landscape sensitivity refers to the value placed on a landscape element, and the level of service it provides to the community. The sensitivity of a landscape may reflect the frequency and volume of users in a CBD location, but may also be valued for other characteristics such as tranquillity, visual relief, and microclimate for example. The value of landscapes is often described in council and state government master plans and planning guidance documents, reflecting the importance of landscape resources to local, regional and the state-wide community. The sensitivity of landscape features is therefore considered in the broadest context of possible landscapes, from those of national importance through to those considered to have a neighbourhood landscape importance. The following terminology is used to describe the level of landscape sensitivity, see Table 3-1.

In this table, the terms **'state'** and **'regional'** landscape sensitivity, are intended to describe the value placed on the landscape by the community. Any landscape features which are afforded legislative protection will be specifically identified in the Policy Framework section of the assessment.

Landscape Modification
Landscape modification refers to the change to the landscape or public realm that would occur as a result of development. This includes direct impacts such as the removal of trees or parkland, but also indirect impacts, such as the functional change of an area of open space due to changing land use and access for example. Landscape modification can result in adverse or beneficial effects. Table 3-2 lists the terminology used to describe the level of landscape modification.

Landscape Sensitivity	Description
National	_Landscape feature protected with national or international legislation, e.g. the Sydney Opera House World Heritage Listed Building and its surrounding public realm.
State	_Landscape feature that is heavily used and is ionic to the State, e.g. Martin Place or Hyde Park.
Regional	_Landscape feature that is heavily used and valued by residents of a major portion of a city or a non-metropolitan region, e.g. the avenue of trees on Anzac Parade.
Local	_Landscape feature valued and experienced by concentrations of residents, and/or local recreational users, e.g. Ward Park on Devonshire Street. _Provides a considerable service to the community. For example, it provides a place for local gathering, recreation, sport, street use by cafes and / or shade and shelter in an exposed environment.
Neighbourhood	_Landscape feature valued and appreciated primarily by a small number of local residents e.g. street trees in a local street. _Provides a noticeable service to the community. For example, it provides a seat or resting place, passive recreation, and / or some shade and shelter in an local street.

Table 3-1 Landscape sensitivity levels

Landscape Modification	Description
Considerable reduction or improvement to landscape quality	_Substantial portion of the landscape is changed. _This may include substantial changes to parkland function, footpath continuity, building access, permeability of local streets, and / or street tree cover for example.
Noticeable reduction or improvement to landscape quality	_Portion of the landscape is changed. _This may include the alteration of parkland function, footpath continuity, building access, permeability of local streets, and / or street tree cover for example..
No perceived reduction or improvement to landscape quality	_Either the landscape quality is unchanged or if it is, it is largely mitigated by proposed public realm improvements.

Table 3-2 Landscape modification levels

3.3 Visual Assessment

The assessment of visual impact is based on the identification of the level of visual modification created by the proposal, and the sensitivity of the viewer. Combined, these characteristics of the view are then considered to assign a level of likely visual impact. This methodology is explained more fully in the following paragraphs.

Visual Sensitivity
Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity.

In order to ensure the assessment of impact is reasonable, the sensitivity of a viewpoint is considered in the broadest context of possible views, from those of national importance through to those considered to have a neighbourhood visual importance. For this reason the following terminology is used to describe the level of visual sensitivity, see Table 3-3.

In this table, the terms **'state'** and **'regional'** landscape sensitivity, are intended to describe the value placed on a view by the community, any view corridor which is afforded legislative protection will be specifically identified in the Policy Framework section of the assessment.

Visual Modification
Visual modification refers to the change to the landscape that would occur as a result of development from a given viewpoint. This includes what has changed, and how it has changed. Visual modification describes the extent of change and identifies elements which are removed or added, changed in scale, form, shape, pattern, colour and texture, and the compatibility of these new elements with the existing landscape. Visual modification can result in an improvement or reduction in visual amenity.

A high degree of visual modification would result if the development contrasts strongly with the existing landscape. A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration with the existing environment. In this situation the development may be seen, but may have a similar form, shape, colour, texture, and line to the existing landscape. Table 3-4 lists the terminology used to describe the level of visual modification.

Visual Sensitivity	Description
National	_Heavily experienced view to a national icon, e.g. view to Sydney Opera House from Circular Quay or Lady Macquarie's Chair, view to Parliament House Canberra along Anzac Parade, panoramic view from Jeffrey Street, Kirribilli to the Sydney Opera House, Sydney CBD and Sydney Harbour Bridge.
State	_Heavily experienced view to a feature or landscape that is iconic to the State, e.g. View along the Avenue in Hyde Park.
Regional	_Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space e.g. Views to the Sydney Town Hall from George Street, or Sydney CBD skyline view from Centennial Park.
Local	_High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users e.g. Great Buckingham Street, Redfern to Redfern Park.
Neighbourhood	_Views where visual amenity is not particularly important, such as lesser quality views briefly glimpsed from roads.

Table 3-3 Visual sensitivity levels

Visual Modification	Description
Considerable reduction or improvement to visual amenity	_Substantial part of the view is altered. _Alteration to the view is clearly visible. _Scale, form, shape, pattern, colour and / or texture substantially different to the surrounding environment.
Noticeable reduction or improvement to visual amenity	_Part of the view is altered. _Alteration to the view is clearly visible. _Scale, form, shape, pattern, colour and / or texture partly different to the surrounding environment.
No reduction or improvement to visual amenity	_Either the view is unchanged or if it is, the change in the view is generally unlikely to be perceived by viewers.

Table 3-4 Visual modification levels

3.4 Assessment of Night Time Visual Impacts

The assessment of night time impacts has been undertaken with a similar methodology to the daytime assessment. However, rather than assessing particular viewpoints or landscape features, this assessment has been undertaken on a precinct by precinct basis.

As a baseline, this assessment draws upon the guidance of the Institution of Lighting Engineers (UK), and their *'Guidance for the reduction of obtrusive light'* (2005). This guidance note identifies environmental zones, useful for the categorising of night time landscape settings. These zones are:

- **E1**: Intrinsically dark landscapes: National Parks, State Forests etc.
- **E2**: Low district brightness areas: rural, small village, or relatively dark urban locations.
- **E3**: Medium district brightness areas: small town centres or urban locations.
- **E4**: High district brightness areas: town/city centres with high levels of nighttime activity.

For visual mitigation, the specific features of the lit landscape are the described in terms of:

- **Sky glow** – the brightening of the night sky above our towns, cities and countryside.
- **Glare** – the uncomfortable brightness of a light source when viewed against a dark background.
- **Light Trespass** – the spilling of light beyond the boundary of the property or area being lit.

The description of visual mitigation at night identifies the lighting associated with the stops, LRV headlights, stabling yards and maintenance facilities.

3.5 Assigning Impact Levels

Following site visits undertaken during June, July and August of 2013, the landscape features and representative viewpoints of the site were identified and assessed.

The landscape impacts have been assessed by identifying all landscape features likely to be directly and indirectly impacted by the project. This includes parks, plazas, notable tree groupings and streetscapes.

The daytime visual impacts have been assessed using a viewpoint based approach. A series of views were selected to represent the range of views to the project, this selection process aimed to identify a range of locations and viewing situations and included views that captured:

- important view corridors, character areas and streetscapes as identified in the planning guidance.
- different visual components of the proposal (Stops, intersection treatments, structures etc.).
- different alignment solutions (located centrally, to the side and crossing roadways).

The night time visual impacts have been assessed by precinct (and sub precinct where applicable), the compatibility of the proposal within the night time environmental zone being identified.

A set significance criteria has been used to assign landscape and visual impact levels. These are further explained in chapter 4 of this report.

3.6 Mitigation Measures

Following the identification of potential landscape and visual impacts any potential opportunities for mitigation have been identified. Measures include options on and off site, during construction and operation of the proposal, day and night.

3.7 Residual Impacts

Assuming the implementation of the proposed mitigation measures, a further assessment of landscape and visual impact has been made, using the significance criteria (refer Section 4). The resulting impacts are the likely residual landscape and visual impacts of the project.

Significance Criteria

Martin Place. Photography by Hassell.

04

04 Significance Criteria

Description of Significance Criteria

Significance is defined in the *Guidance for Landscape and Visual Impact Assessment*, Third Edition (2013) as "a measure of the importance or gravity of the environmental effect".

The following significance criteria have been developed specifically for the landscape and visual impacts of the proposal. The purpose of the criteria is to ensure there is a clear and consistent means of evaluating impact. For the assessment of visual and landscape impacts during construction and operation, during the day, the following criteria have been used. (Table 4-1)

		Sensitivity				
		National Sensitivity	**State level Sensitivity**	**Regional Sensitivity**	**Local Sensitivity**	**Neighbourhood Sensitivity**
Modification	**Considerable reduction**	Very high adverse	Very high adverse	High adverse	Moderate adverse	Minor adverse
	Noticeable reduction	Very high adverse	High adverse	Moderate adverse	Minor adverse	Negligible
	No perceived change	Negligible	Negligible	Negligible	Negligible	Negligible
	Noticeable improvement	Very high beneficial	High beneficial	Moderate beneficial	Minor beneficial	Negligible
	Considerable improvement	Very high beneficial	Very high beneficial	High benefit Moderate beneficial	Minor beneficial	Minor beneficial

Table 4-1 Landscape and visual impact significance criteria

For the assessment of visual impacts during construction and operation at night, the following criteria will be used. (Table 4-2)

In the allocation of these significance levels, there may be situations where both beneficial and adverse changes occur in tandem. In these cases a judgement must be made as to the overall effect. In some locations, these effects counteract each other and a negligible overall impact results. In other locations, a negligible impact may be assigned in a situation where change will occur but will be in character with the existing landscape or visual condition. In this way the methodology assures that change is not always considered to have an adverse effect on the amenity of a view or condition of a landscape feature.

Through the assessment of significance, there should be an acknowledgement of the inherent mitigation and the integrating effects of urban design treatments contained within the design.
These impact levels do not necessarily prioritise the need for mitigation measures, any opportunity to mitigate the effects of the project should be considered, regardless of the significance level.

	E1: Itrinsically dark landscapes	E2: Low district brightness	E3: Medium district brightness	E4: High district brightness
Considerable reduction	Very high adverse	High adverse	Moderate adverse	Minor adverse
Noticeable reduction	High adverse	Moderate adverse	Minor adverse	Negligible
No perceived change	Negligible	Negligible	Negligible	Negligible
Noticeable improvement	High beneficial	Moderate beneficial	Minor beneficial	Negligible
Considerable improvement	Very high beneficial	High beneficial	Moderate beneficial	Minor beneficial

Table 4-2 Night time visual impact significance criteria

The CSELR Proposal

Aerial Image of Sydney showing the proposed Light Rail alignment and the existing light rail line. Photography by airviewonline.com

05

05 The CSELR Proposal

5.1 Overview

The CBD and South East Light Rail project ('the CSELR proposal' or 'the CSELR') comprises construction and operation of a light rail service from Circular Quay to Kingsford and Randwick via Surry Hills. The proposed route of the CSELR is shown in Figure 5-1

The key features of the CSELR proposal include:

- high frequency, 'turn up and go' services every two to three minutes during peak periods within the CBD and out to Moore Park, with services operating every five to six minutes between Moore Park and the Randwick and Kingsford branches.
- a pedestrian zone in George Street from Bathurst Street to Hunter Street, with light rail vehicles (LRVs) operating wire–free in this zone (except for overhead wires at stops used for charging LRVs).
- 20 light rail stops along the route, including interchange with heavy rail at major rail stations (Circular Quay, Wynyard, Town Hall and Central), ferry interchange at Circular Quay, and bus interchanges at the Town Hall, Queen Victoria Building, Rawson Place, Central Station, Randwick and Kingsford stops.
- platforms at all stops to accommodate 45 metre long LRVs, except at the Central Station and Moore Park stops, where platforms would be provided to accommodate both 45 metre and 90 metre long LRVs (double–length vehicles for special event services between Central Station and Moore Park).
- terminus facilities at the Circular Quay, Kingsford and Randwick stops.
- facilities in Randwick and at Rozelle for LRV stabling and maintenance (including wash down).
- integration with the existing light rail system including a new junction between the two lines at the intersection of Hay Street and George Street.
- approximately 12 substations along the route (each approximately 80 square metres in area) to supply power for the LRVs.
- a new bridge structure spanning the Eastern Distributor.
- a tunnel under Moore Park and Anzac Parade.
- a fleet of approximately 30 electric-powered LRVs (including spare LRVs), approximately 45 metres long, featuring air conditioning and accessible low-floor design.
- a highly reliable service with the capability to carry up to 9,000 passengers per hour in each direction.
- capacity for approximately 80 seated and 220 standing passengers in each LRV.
- public domain improvements including concepts for paving, street trees, lighting and furniture.

The CSELR proposal would include an 'inbound' track (heading towards Circular Quay stop) and an 'outbound' track (heading away from Circular Quay stop) for LRVs and a series of cross-overs and turnouts throughout the corridor. The track separation between the inbound track and the outbound track centre lines would be nominally 3.2 metres. This distance would increase slightly on curves to allow for vehicle operation at these locations.

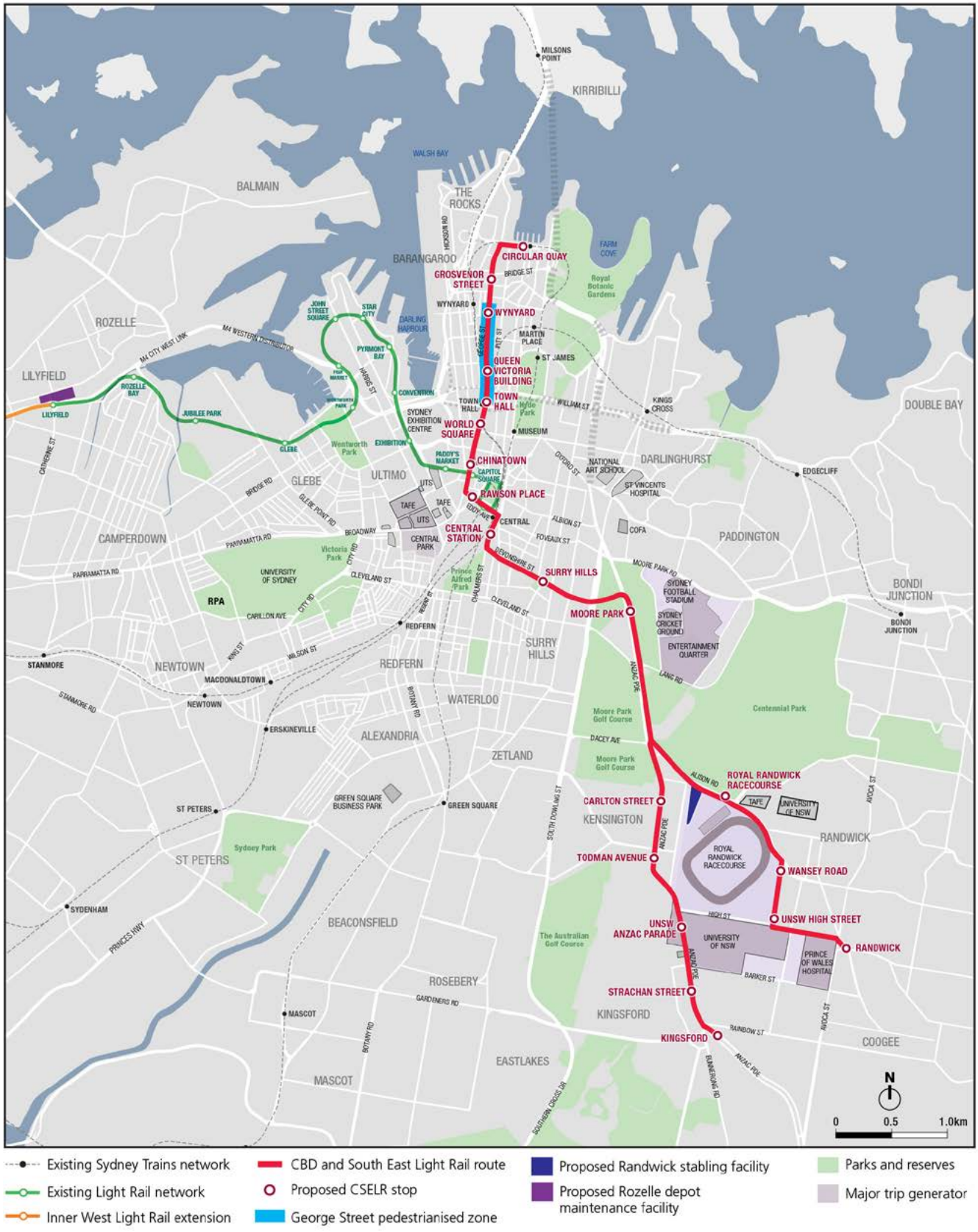
The proposal corridor would generally be between approximately 6.5 metres and 13 metres in width depending on the track and stop configuration and the location of other ancillary infrastructure.

The proposal also includes the following changes as a result of the CSELR and within the direct corridor of the proposal:

- changes to property and utilities access (including car parks, taxi ranks, loading docks)
- traffic management changes (excluding buses, which comprise a separate project as part of the Sydney City Centre Access Strategy (SCCAS), as explained in section 1.6 of Volume 1 of the CSELR Environmental Impact Assessment).

It is anticipated that it would take approximately five to six years to build the CSELR, with work beginning at multiple sites from mid-2014 (subject to planning approval).

Figure 5-1 Overview of the CSELR proposal and the existing light rail network



Associated road configuration and traffic management changes

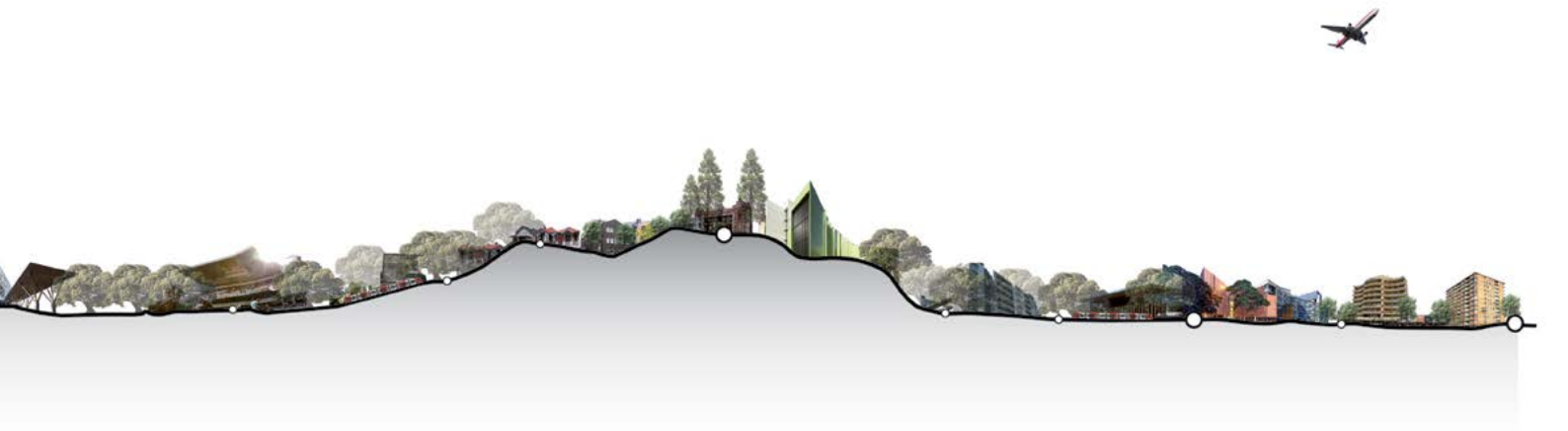
The key road configuration and traffic management changes as a result of the CSELR include:

- the creation of a pedestrianised zone along George Street between Hunter Street and Bathurst Street;
- conversion of Pitt Street to two-way operation between Hunter and Alfred Streets;
- addition of a turning circle at the northern terminus of Pitt Street;
- conversion of Hunter Street between Pitt and George Street to two-way operation providing enhanced connectivity to the east and west;
- construction of a bus-light rail interchange in Rawson Place facilitating cross-platform interchange between bus and light rail for a significant number of customers travelling south-west of Railway Square along Broadway;
- construction of the light rail line in the kerb side lane in Eddy Avenue, requiring the relocation of existing coach facilities to a dedicated 4.5-metre wide island coach platform accessed (by coaches) from the existing Eddy Avenue traffic lanes;
- modification to the operation of Devonshire Street including:
  - provision of a single eastbound traffic lane, of a minimum width of 3 metres;
  - existing right-turn movements for vehicles travelling eastbound along Devonshire Street wishing to head south are consolidated to Elizabeth Street and Crown Street only;
  - closure of a number of connecting intersection streets along Devonshire Street including Buckingham Street, Holt Street, Clisdell Street, Waterloo Street and High Holdborn Street;
  - removing the provision for parking along Devonshire Street;
  - signalisation of the intersection of Devonshire Street and Marlborough Street;
  - signalisation of the intersection of Devonshire Street and Bourke Street;
  - reinstatement of the Adelaide Street connection between Waterloo Street and Riley Street; and
  - introduction of a westbound service lane connection between Bourke Street and Wilshire Street.
- permitted right-turn locations from Anzac Parade south of Alison Road to be restricted in the future to:
  - southbound right-turn into Dacey Avenue;
  - southbound and northbound right-turn into Todman Avenue;
  - northbound right-turn into High Street; and
  - southbound and northbound right-turn into Barker Street.

- restriction of city-bound traffic to two through lanes along Alison Road adjacent to the Darley Road/Alison Road intersection;
- relocation of the cycleway and footpath along Wansey Road to the eastern side, requiring a crossing of Wansey Road at the intersection with Alison Road to connect to the cycleway on the western side of Alison Road;
- modification to the operation of High Street including:
  - relocation of existing bus stops as required;
  - introduction of traffic signals at the intersection of High Street and Hospital Road, as well as the intersection of High Street and Clara Street;
  - consolidation of the entrance to the Sydney Childrens Hospital to a four way intersection at Clara Street;
  - restriction of access to Eurimbla Avenue to left in left out;
  - provision for indented bus bays for westbound buses on High Street adjacent to the Prince of Wales Hospital and between Botany Street and Wansey Road (within the UNSW site); and
  - relocation of the westbound bus stop adjacent to the Children's Hospital emergency entrance to Clara Street, with access to the hospital via a signalised intersection.

Proposal Timeframe

Subject to planning approval, construction of the CSELR proposal (including property acquisition, service relocations, building demolition and tree/vegetation clearance) are anticipated to be undertaken from mid-2014 and is anticipated to take approximately five to six years to complete. The proposal is expected to be commissioned (i.e. operational) in 2019–2020. This program is based on the current design and construction staging. Therefore, the program is indicative only and may change once the construction contractor(s) is engaged.



5.2 Urban Design Strategy

The urban design strategy in the current design proposal for the CSELR project is driven by the following four principles:

1. **A Renaissance in Sydney's Transport** - the renaissance of light rail in Sydney would transform the city's public domain unlike any other in recent history. The street-based light rail system aims to integrate with the city's existing fabric whilst providing opportunities for improving Sydney's public spaces as well as providing future catalytic opportunities along the entire corridor.

2. **People are the Focus** - the light rail would stimulate and create new patronage for public transport in the city and suburbs, as well as creating a new pattern book of movement and behaviours, lessening the demand on buses and private vehicles into the CBD. It would make 'people' the priority.

3. **Making New Places** - using a place-based and context-based approach, the corridor has been analysed forensically to provide certainty of understanding to the highest degree possible of the urban design issues facing the corridor - from Circular Quay to Kingsford and Randwick.

4. **Imagining the Future** - most importantly, the collaboration and commitment amongst all involved in the project have enabled more integrated 'imagining', resolution of issues and ultimately feasible solutions.

These drivers have been translated into the following key urban design objectives:

- Exhibit the unique character of the different light rail routes through the landscape.
- Where possible provide a seamless integration with the existing urban plane and open spaces of the city.
- Minimise the impact of the installation of the proposed alignment on the established vegetation of the city.
- Where installation of new vegetation is required, respond to current street tree and tree master plans of the city, and the existing landscape character of the area.

The urban design strategy includes consideration and design of the following range of elements: poles and overhead wires; associated street lighting and switching track lighting; cabinets and furniture; stops and interchange platforms and canopies; footpaths, ramps and fencing; signage and way finding; and landscape treatments.

Of these elements, the overhead wire (OHW) system and associated poles would be one the most permanent aspects of the new CSELR network. Light Rail Vehicles (LRV's) come and go according to a timetable, however the new infrastructure including the wires, connections, supporting poles and other elements (stops, substations, cabinets, driver facilities, switches, tracks, track slabs, drainage etc.) are fixed in the streetscape and have the most noticeable impact on the overall context of a place.

To reduce the visual prominence of the catenary, the CSELR would incorporate a 'wire free' section of the network between Hunter Street and Bathurst Street along George Street within the City of Sydney. This would remove the requirement for overhead wires for the operation of the LRV's from the streetscape apart from stops where overhead charging 'bars' would be located to enable LRV's to charge. The charging infrastructure would be carefully incorporated into the design of the stop to ensure minimum visual impact.

Where the spacing of poles varies, the existing 'rhythm' of existing street light and other poles (such as the City of Sydney 'smartpoles' on George Street) would be affected. Understanding the rationale of pole spacings would be a critical factor when working on George Street in particular but also other locations (such as Anzac Parade and Wansey Road for example). The existing streetscape has been analysed to ascertain the level of design required minimising the visual and physical impact of the wires, especially where significant and culturally important street trees and other features exist.

Mitigation of Impacts incorporated into the design

The project has mitigated many of the impacts of the light rail, through a range of design measures. This has included:

- Integration of the City of Sydney's George Street Concept Plan for the design of the public domain along the length of George Street, including the pedestrianised zone between Hunter Street and Bathurst Street.
- Collaboration with the City of Sydney on the design for Devonshire Street, minimising impacts to the streetscape whilst allowing future provision for new open spaces along the street.
- Developing a high quality public domain approach for the project based on the consultation with City of Sydney and Randwick City Council.
- Incorporating a tunnel across the playing fields of Moore Park to maintain the existing recreational uses.
- Design of the Moore Park stop at grade to minimise impacts to the existing features including the heritage-listed Fig trees, access to the Sporting stadia as well as the AFL training oval.
- Utilising the central median of Anzac Parade to ensure equity of access from both sides of the street, and minimising impacts to the existing businesses and residences.
- Developing a strong stop strategy to ensure light rail visibility to new users.
- A landscape strategy to mitigate the impacts as a result of the loss of existing trees.
- An integrated urban design strategy to mitigate the impacts of the new infrastructure associated with the light rail – the tracks, wires, poles etc.
- George Street
- Wimbo Park
- Moore Park East

At night the strategy for lighting is to ensure the project contributes to a safe and legible streetscape. In particular, the lighting required for the project has been mitigated as follows:

- All lights would be located at a similar level to the overhead catenary system so to minimise the light spill onto adjacent areas.
- All lights will be directed downwards, with the exception of feature lighting that will always be capped by a surface material.
- Light colour will be designed in response to the surrounding context and be selected to complement the surrounding lighting colour.
- Australian Standard levels for public safety and CCTV, no unnecessary lighting will be provided.

Specific urban design strategies will be discussed for each precinct in the following sections.

City Centre

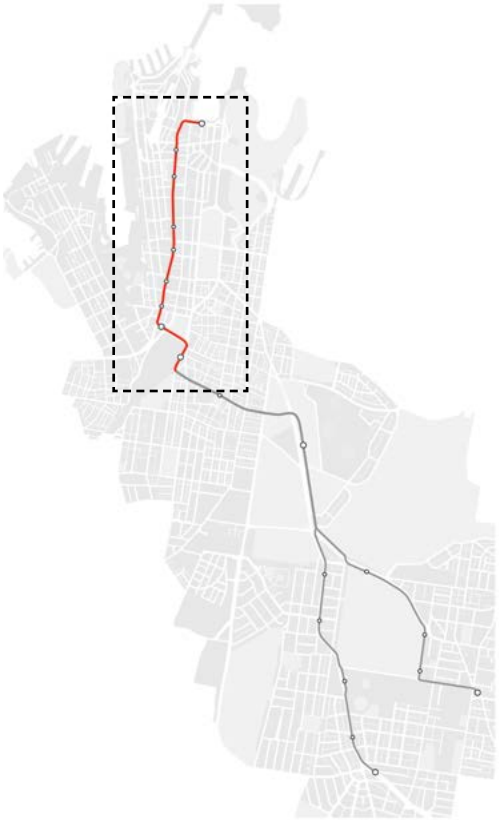
Queen Victoria Building. Photography by HASSELL

06

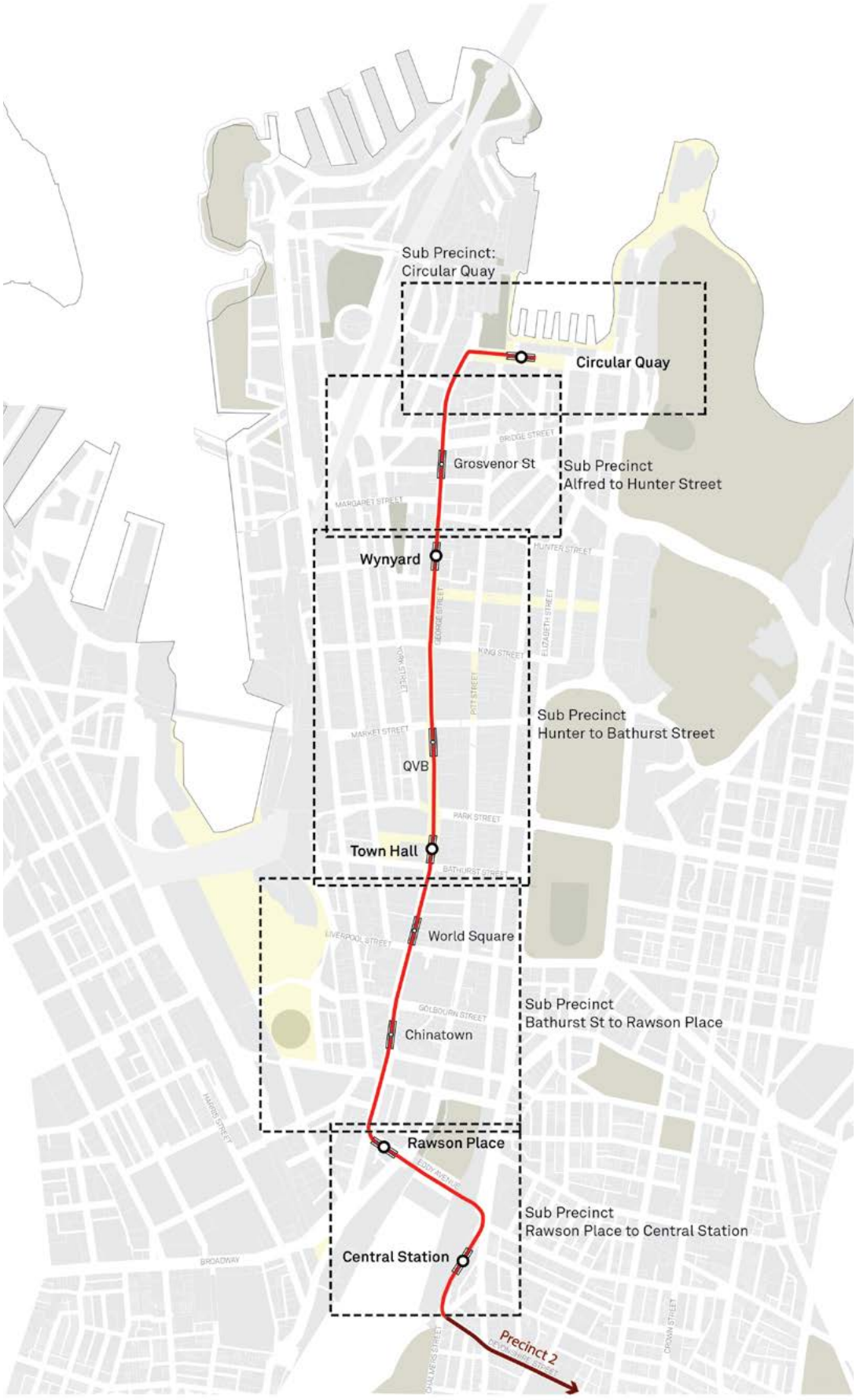
06 City Centre
Overview

Overview

This precinct starts with an Interchange Station at Circular Quay, adjacent to the Circular Quay railway station and ferry terminal. It turns south and follows George Street past a series of iconic CBD locations including Martin Place, the Queen Victoria Building and Town Hall, turns east at Rawson Place where an interchange will be located, and continues on to Central Station with a stop on Eddy Avenue and Chalmers Street.



Key Plan


Sub Precinct:
Circular Quay
Circular Quay
Grosvenor St
Sub Precinct
Alfred to Hunter Street
Wynyard
Sub Precinct
Hunter to Bathurst Street
QVB
Town Hall
World Square
Sub Precinct
Bathurst St to Rawson Place
Chinatown
Rawson Place
Sub Precinct
Rawson Place to Central Station
Central Station
Precinct 2
BRIDGE STREET
MARGARET STREET
HUNTER STREET
GEORGE STREET
KING STREET
ELIZABETH STREET
CASTLEREAGH STREET
PITT STREET
MARKET STREET
PARK STREET
BATHURST STREET
LIVERPOOL STREET
GOULBOURN STREET
HARRIS STREET
EDDY AVENUE
BROADWAY
CHALMERS STREET
CROWN STREET

6.1 Policy Framework

The following review identifies the key documents which provide the policy context for the landscape and visual impact assessment of the City Centre precinct.

Sydney Opera House – World Heritage Listing, UNESCO, Inscripted 2007
The Sydney Opera House is included on the World Heritage list for its significance as a 20th century icon of architecture. Its values relate particularly to its setting on Sydney Harbour which are protected with a buffer zone. The Advisory Body Evaluation states that: *"All elements necessary to express the values of the Sydney Opera House are included within the boundaries of the nominated area and buffer zone. This ensures the complete representation of its significance as an architectural object of great beauty in its waterscape setting*" (UNESCO World Heritage List, Advisory Body Evaluation http://whc.unesco.org/en/list/166, 2013).

Sydney Regional Environmental Plan, Sydney Opera House Buffer Zone, 2005
The Sydney Opera House buffer zone map is contained within the Sydney Regional Environmental Plan (now a deemed state environmental policy (SEPP)). This Plan identifies lines of sight and view corridors to the Opera House and identifies the boundaries of the buffer zone to ensure when development occurs that it would *"avoid any diminution of the visual prominence of the site when viewed from these public places*" (Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW) (Harbour REP)).

The buffer zone, which effectively provides protection and management of the values of the Opera House, extends south to the Cahill Expressway, and south and west along George Street to the intersection with Grosvenor Street. This zone includes First Fleet Park in its entirety.

Refer figure 6.1 The Sydney Opera House Buffer Zone, 2005.

Circular Quay Strategic Framework - Stage 1 Report , Sydney Harbour Foreshore Authority, August 2013 (not a public document)
In July 2012 the NSW Government endorsed the preparation of a Strategic Framework to 'guide and inform decision making by NSW Government agencies, the City of Sydney and private landholders and investors in the Circular Quay Precinct.

A PCG (Project Control Group) was established under the direction of the Minister for Planning and Infrastructure, to be led by the Sydney Harbour Foreshore Authority and includes the following agencies:
- Department of Premier and Cabinet
- Transport for NSW (TfNSW)
- Department for Planning and Infrastructure
- Roads and Maritime Services
- Sydney Ports Corporation
- City of Sydney

The document aims to provide:
- a clear and practical vision for Circular Quay enhancing its status as a gateway to Sydney;
- an attainable plan to guide current and future projects; and
- a governance structure that assists a coordinated and well managed precinct.

Eight guiding principles have been established to guide development projects, and be applied across the agreed Circular Quay precinct. The PCG identified nine priorities, that, *'when delivered in an ordered manner alongside the current commitments, can significantly improve the precinct'.* This includes several public domain priorities including the *'de-cluttering of the precinct to minimise the infrastructure footprint'* (Priority 3).

Section 4, 'Priorities for Action', identifies current projects including the light rail project. The PCG sub committee has looked at key issues, identifying six areas including location of the stop, minimising the overall infrastructure footprint, need for three tracks, protection of view corridors, removing and reducing visual clutter and avoiding barriers.

The report also includes planning for overseas passenger terminal patrons, as well as highlighting '*the differing views over the location of the light rail terminus in either Alfred Street or within George Street*'.
The PCG sub-committee will continue to review the design, with the aim of providing an *'exceptional shared space where pedestrians are a priority and visual and functional barriers are minimised'.*

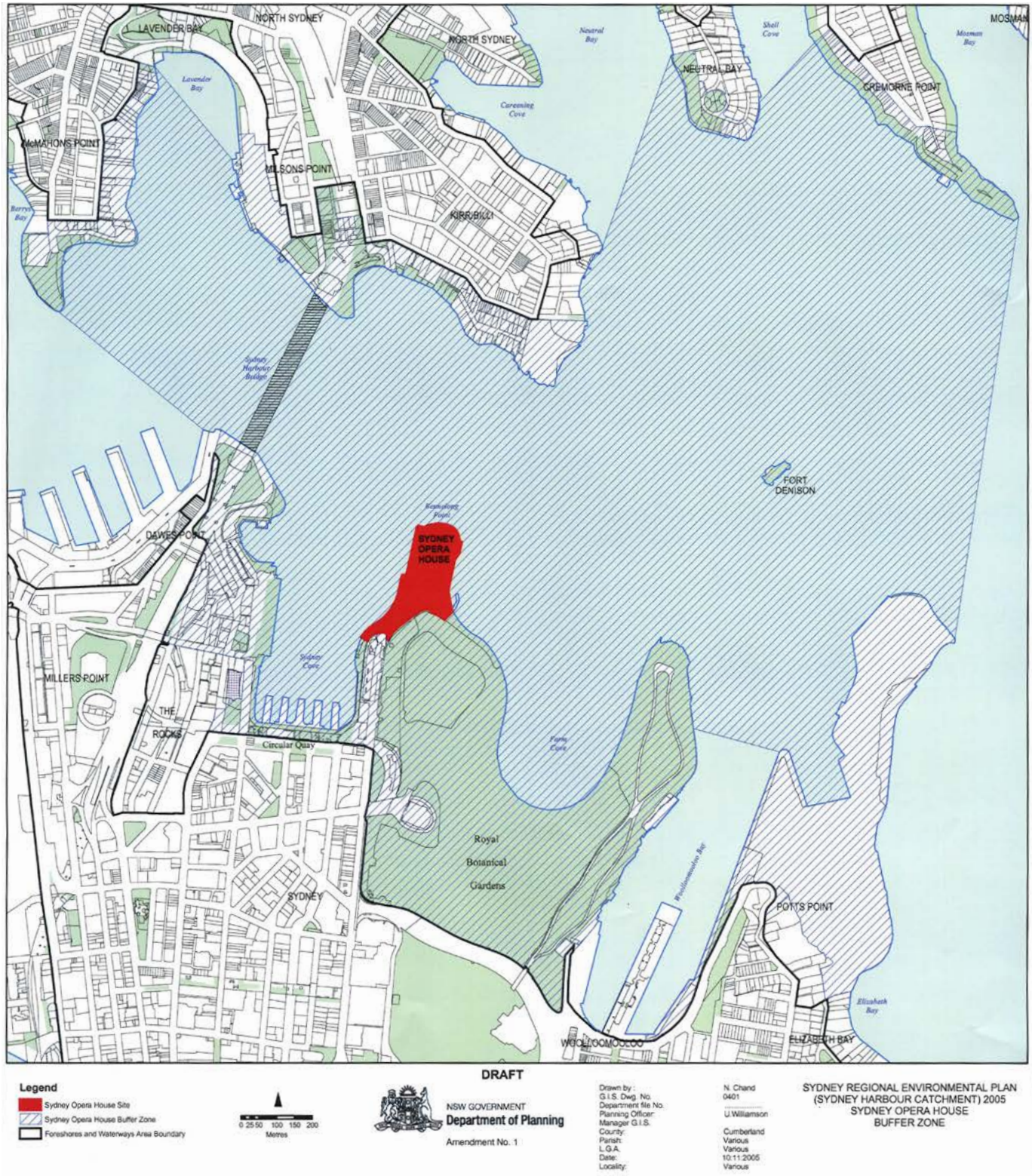


Figure 6.1 The Sydney Opera House Buffer Zone, 2005
Sydney Regional Environmental Plan, Department of Planning

Sydney Development Control Plan (DCP), City of Sydney, 2012

The *Sydney Development Control Plan* identifies a number of Special Character Areas (SCA). The desired future character and relevant supporting principles identified for the special character areas relevant to this precinct are summarised in the following paragraphs.

Circular Quay Special Character Area
The southern side of the Cahill Expressway is characterised by buildings of different architectural scales, styles and periods. The expressway and railway largely obscure the ground plane of Alfred Street from the harbour gateway and a number of significant public spaces.

Principles: new development associated with the Circular Quay transport interchange should be consistent with and enhance the public domain; maintain and enhance views to the water, the Harbour Bridge and the Opera House from the Quay, and from the water to Quay and City beyond.

Bridge Street / Macquarie Place / Bulletin Place Special Character Area
George Street forms the western edge of this SCA, being centred on Bridge Street which reflects the area's early topography and one of Sydney's pre-eminent urban spaces.

Principles: maintain and enhance the vista along Bridge Street to the Conservatorium of Music.

Wynyard Park / Lang Park Special Character Area
George Street forms part of the eastern edge of the Wynyard Park / Lang Park SCA. The SCA is centred on Wynyard Park which is considered as a northern gateway to Central Sydney. George Street maintains a visual connection to the northern edge of Wynyard Park which is dominated by mature border plantings.

Principles: new development protects and enhances east-west vistas along Margaret Street.

Martin Place Special Character Area
The western end of Martin Place terminates at George Street, the civic and ceremonial heart of the City. Martin Place is a high quality, pedestrianised urban environment characterised by a wide linear space defined by uniformity of buildings lining the Place.

Principles: protect existing significant vistas to the west; and retain human scale at street level, while respecting and positively responding to the monumental nature of the place.

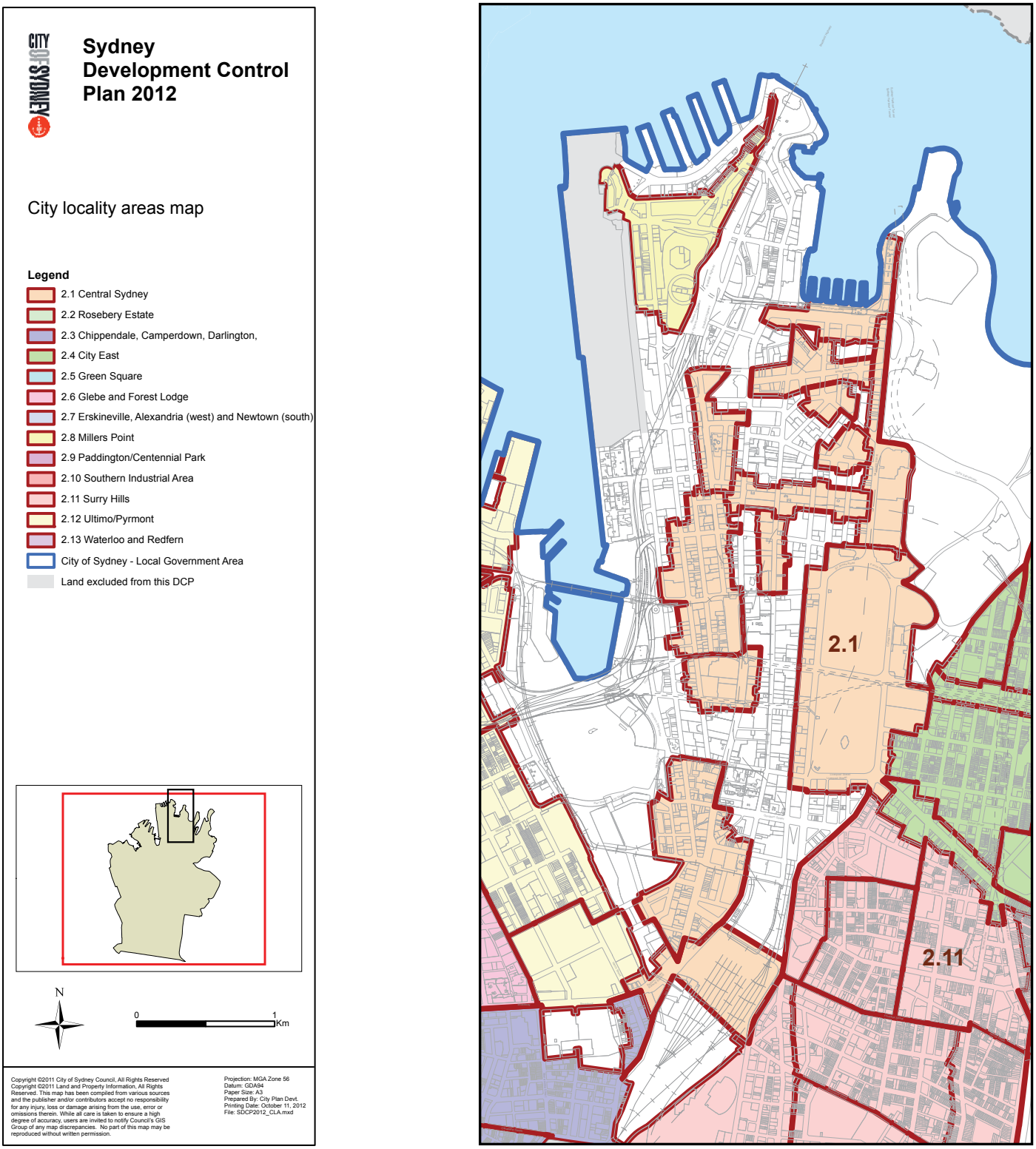
York Street Special Character Area including Clarence Street and Kent Street
The proposed light rail would traverse through the eastern edges of this locality at the intersection of King and George streets (largely characterised by warehouse typologies) and adjacent to the Queen Victoria Building (QVB) on George Street. The grand scale and architectural quality of the QVB creates a distinctive street edge.

Principles: conserve and enhance existing significant vistas terminated by the QVB and the Sydney Town Hall, such as those along Mullins Street and York Street.

Sydney Square / Town Hall / St Andrews Special Character Area
The grand sandstone Town Hall building, together with St Andrews Cathedral and the QVB (in the SCA immediately north) define this intersection of George Street and Park Street which is otherwise part of a variegated townscape of central Sydney. The precinct acts as a gathering place and visual focus of the city centre. It is dominated by high levels of pedestrian and vehicular movements.

Principles: development associated with the Town Hall interchange is consistent with enhancement of the public domain at Sydney Square; maintain and enhance important existing views and vistas to the clock tower of Town Hall from George Street and the spire of the Cathedral from George Street; and achieve a new civic square opposite Town Hall as an active civic outdoor focus.

Figure 6.2 The Sydney Development Control Plan, 2012
City of Sydney



Sydney Development Control Plan (DCP), City of Sydney, 2012

Haymarket / Chinatown Special Character Area
George Street runs through the middle of the Haymarket / Chinatown Special Character Area. The area is largely characterised by commercial land uses and buildings of differing architectural styles of approximately three and four storeys, a fine grain subdivision pattern and narrow plots which contributes to a predominately vertical façade structure, richness in detail and vibrant street life.

Principles: maintain and reinforce permeability of the original street pattern, special corner treatments; and maintain and enhance vistas east along Valentine Street to Christ Church St Lawrence.

Railway Square / Central Station Special Character Area
The proposed light rail route would follow the northern and eastern edges of this SCA which functions as a transport interchange node. Central Railway Station, and its clock tower, is a key civic landmark amongst a built form predominated by multi-storey warehouse typologies.

Principles: maintain and enhance the visual prominence and landmark significance of the clock tower in views and vistas from George Street.

City Edge Special Character Area
The intersection of Eddy Avenue and Elizabeth Street forms the south-western corner of the SCA. The SCA is largely commercial in nature and dominated by a fine grain with pockets of Federation warehousing typologies and terrace housing.

Principles: maintain street corridor views to Central Sydney in the north along Elizabeth Street.

Prince Alfred Park East Special Character Area
The Prince Alfred Park East SCA includes Prince Alfred Park and a mix of residential terraces interspersed with street level retail, commercial uses and warehouse buildings on the western side. Central Station forms a legible edge to the north of the SCA.

Principles: retain the existing street setbacks and alignment in response to the original street grid pattern of the area.

Circular Quay Master plan, NSW Public Works (Government Architect's Office) and HASSELL, 2010
The Circular Quay Master plan aims to deliver a long term vision for Circular Quay as the iconic gateway to Sydney CBD. It covers the area of the foreshore from the Opera House steps to Dawes Point Park under the Harbour Bridge including the Circular Quay Railway Station and First Fleet Park. The key principles and proposals that relate to landscape and design around Fleet Park and Circular Quay harbour are:
- Integrated transport hub.
- Reclaimed public open space and improved connections.
- Activated waterfront and new frontage to Circular Quay.

First Fleet Park, Sydney Harbour Foreshore Authority, 2011
Sydney Harbour Foreshore Authority plans to rejuvenate First Fleet Park as part of the wider project of the West Circular Quay area. The key principles and proposals relating to landscape and design are:
- Creating a simplified and integrated park space to unite disconnected spaces including the redevelopment of Museum of Contemporary Art (MCA) and the City of Sydney's proposed future urban square on Alfred Street.
- Clear and generous links with rationalised level changes and improved access to The Rocks, George Street and Alfred Street.
- Open up key views to and from George Street, to the Harbour and from Alfred Street to Circular Quay. The 'Lookout', a paved platform off George Street, is proposed as a shaded gathering space with a key vantage point over the whole park and harbour.
- Maximise green space through proposed 'The Green' and 'The Lawn' at the corner of George and Alfred Street, and in front of MCA. Landmark trees located to preserve views and provide shade.
- Respond to history of site through the park structure, landscape and interpretive display.

George Street Concept Design, City of Sydney and Gehl Architects, 2012
Gehl Architects and the City of Sydney developed a concept design for George Street which identifies a number of design principles to guide the integration of light rail into the public realm. Key recommendations pertaining to the landscape and setting for George Street include:
- Create a wire-free zone for the light rail in the pedestrian zone (between Liverpool and Bridge Streets) in part to reduce the visual clutter of the system and respect the streetscape of George Street and the buildings that make a positive contribution to this streetscape.
- Consolidation of infrastructure at light rail stops to reduce visual clutter.
- Visually define the light rail corridor through a lighter colour paving stone and reinforce George Street as a unique boulevard.
- Remove existing Plane trees and locate new trees away from building lines and increase the canopy coverage along the street. A new street tree species is recommended for George Street, the Japanese Elm (Zelkova serrata), to add to the legibility and visual appeal of the streetscape.
- Produce a coordinated public domain suite.
- Create a pedestrian- focussed boulevard that has a distinct night-time identity through measures such as in-ground lighting.
- Embed art into the streetscape along the length of George Street.
- Enliven the street edge through activation of ground floor uses and outdoor dining.

Town Hall Precinct +Square Urban Design Study' for CoS by Tony Caro Architects, March 2010
The George Street Urban Design Study looks at the transformation of George Street into a pedestrian boulevard linking 'three great squares': Circular Quay ('Water Square'), Town Hall Square ('Sydney's Living Room') and Railway Square ('Transport Square').

The Town Hall Square sees a creation of a civic square opposite Town Hall with the removal of existing buildings. This new public realm would be well activated and stretch across George Street to create a 'setting' for the Town Hall.

George Street design principles would apply here to define the pedestrian and light rail corridor. (Source: Draft George Street Urban Design Study, City of Sydney and Gehl Architects, January 2012)

Central Station Strategy – Towards 2060, NSW Department of Transport (Rail Corp) and GHD, 2011
GHD and the NSW Department of Transport (Rail Corp) developed a master plan for Central Station as a guiding framework for the development and evolution of Central Station with a focus on the tangible spatial requirements of the future. The vision is 'Planning a World Class Transport Hub'. The key themes are:

- An emphasis on improving pedestrian connections and quality of pedestrian experience such as legibility, amenity and directness.
- Using Station redevelopment as catalyst for improvement of surrounding areas such as street upgrades, pedestrianisation and traffic calming.
- Retention of historical/heritage features.

Key proposals (master planning elements) of the Central Station Strategy that would impact the design of the light rail but are not part of the CSELR proposal include:

- Expand sheltered concourse at Eddy Square to enhance northern gateway into station, improve pedestrian space and accessibility to station while activating the space with improved retail uses.
- Redevelopment along southern edge of Eddy Avenue to invigorate precinct and improve streetscape and complement iconic northern façade of station.
- Widening and improvement of south side of Eddy Avenue footpath to provide attractive and DDA-compliant path.
- Underpass links at Eddy Avenue to Belmore park, Elizabeth Street to Centennial Plaza and Chalmers Street to Elizabeth Street to accommodate pedestrian crossing and vehicle-pedestrian conflict.
- Improvement of Chalmers Street Transit Interchange to accommodate increased public transport interchanges activities and increase pedestrian safety. This includes bus and proposed light rail and cycling facilities.
- Development over Central Station on the south end of Chalmers Street to include seven storey commercial building, ground level retail and provide both activated edge and opportunities for private investment.
- Rawson Place and Eddy Avenue to be reconfigured for a light rail terminus to allow to adequate and efficient pedestrian interchange facilities and opportunity to activate northwest corner of Central.

6.2 Urban Design Strategy

The Urban Design Strategy has been developed in concert with the key stakeholder, the City of Sydney. The project design team have worked closely with the City Design team to coordinate and discuss the TfNSW requirements for the light rail project (including stops, tracks, wires, wire free, poles, shelters, grading, etc) and the City's George Street Concept Plan. There is now a generally well coordinated and agreed approach to the design of George Street which incorporates the City's plans as well as the light rail requirements.

The project urban design strategy refers to Precinct 1 as a 'Civic' typology, which is a reference to the dense urban context that the light rail crosses through in this part of the city.
This precinct will include the new City of Sydney Public Domain Suite for street furniture which includes street lighting, seats, benches, tree grilles, bubblers, etc. At the time of writing a replacement smart pole was not identified as a new Lighting Strategy, together with the pedestrianisation between Bathurst St and Liverpool St, seems to have removed the need for the old smart poles. However it is understood that as a result of TfNSW and City of Sydney working together, new smart poles suited to attaching overhead wires south of Liverpool Street are under development.

The urban design strategy for CBD stops incorporate side platforms within both pedestrianised and traffic zones, with the interchanges designed according to functional and capacity requirements (at Circular Quay and Rawson Place).

The design strategy for stops within the pedestrianised zone of George Street has been to integrate the stops as much as possible with the surrounding pedestrian areas - maximising permeability, transparency, views, and access. The intent is, where existing topography allows, to ensure an integrated 'step free condition' along the back face of the platform, such that the platform is at the same level of the surrounding pedestrian zone.

The theme for the 'Civic' precinct materials and treatments is described in the following paragraphs.

CIVIC - Material Strategy

The materials to be used in the City Centre precinct have been drawn from the Sydney vernacular. They would strike a balance between the refined and elegant qualities required in the City of Sydney Civic zone, and the Park and Boulevard precincts along the South East route. All materials are chosen to be comfortable for users, cost effective and designed in standard panels for ease of replacement.

The existing materials – largely granite kerbs and paving – are proposed for the new works as a continuation of the 'floor' of George Street. This will include a stone paving that may be differentiated within the track zone via colour and texture.

Pedestrian Zone Materials
Within the pedestrianised zone, a higher quality of finish is proposed on the shelter components. The design concept proposes steel that is finely detailed and finished with a neutral charcoal micaeous paint, crisp infill panels, close off columns with concealed services, and a glazed canopy with a white ceramic soffit that floats above with cantilevered ends. Benches formed with solid timber slats can be fixed between columns, if required.

Traffic Zone Materials
The painted steel frame is as per the Civic - pedestrian zone, and the glazed roof is replaced with a solid roof comprising a tightly battened timber soffit, or a flat metal panel, with a standing seam copper roof. Benches formed with solid timber slats can be fixed between columns, with handrails to match the City of Sydney's new George Street public furniture strategy.

CIVIC - Stop Design

Pedestrianised Zone
The stops located within the pedestrian zones include: Circular Quay, Wynyard, and Town Hall. These stops, would have side platforms, and be designed to be part of the public domain. The platforms would be integrated with the streetscape using materials that are complementary to the overall palette of the pedestrian zone.

These stops are to be highly accessible, with level access to the back of the platforms where possible. The platform canopies will be designed in response to the existing building awnings adjacent to the stops, so that there is a seamless integration within the existing streetscape.

Traffic Zone
The stops within the traffic zone include: Grosvenor Street, World Square, Chinatown, Rawson Place, and the Central Station stop on Chalmers Street. The design intent for these stops is to provide safe access for pedestrians when crossing vehicle lanes, while minimising the visual extent of barriers and bollards.

The vehicle traffic lanes beside these stops will be treated with a material finish that encourages traffic calming and alerts drivers to slow down and be aware of pedestrians.

6.3 Existing Landscape Character and Visual Conditions

This precinct is characterised by the urbanised verticality of the CBD and the varying topography that sees George Street rising from Circular Quay, on the harbour, to a high point near Wynyard before dropping again towards Central Station.

The built form is marked by often iconic and identifiable buildings. Sydney's finest sandstone buildings front onto George Street including the former General Post Office and former Bank buildings at Martin Place, the Queen Victoria Building, Sydney Town Hall, and the Strand Arcade, amongst many others. Juxtaposed against this historic urban fabric are contemporary buildings including Australia Square, the Hilton Hotel and Grosvenor Place, high-rise towers and recently refurbished buildings such as the ultra-modern Apple store on the corner of King Street and George Street.

This built form channels views along the street, where the eye is constantly drawn to another iconic façade or roofline, creating a grand and visually stimulating urban environment. Where historic buildings do not draw the eye, high-rise towers feature. In views oriented north, as George Street bends slightly east at Essex Street and west at King Street, views generally feature the cylindrical Australia Square as a focal point; whereas views south feature the modern HSBC tower and cluster of modern buildings at the corner of Bathurst and George Streets as the focal point of the view.

Sydney's cross streets provide glimpses east and west, on occasion providing views to major parks, such as at Hyde Park from George Street along Market Street, and views towards Darling Harbour, from the Queen Victoria Square at Druitt Street for example.

Footpaths skirt the edges of the buildings, busy with people both day and night. Four lanes of traffic with a dense flow of cars, taxis and buses dominate the street level character. Particularly in the southern areas of the site at George Street, views to visually interesting facades are often limited by awnings and the constrained nature of the public realm.
There are a number of plazas and squares that exist along the route. Of particular note is Martin Place a pedestrianised street surrounded by a number of iconic heritage buildings and including the World War I ANZAC Cenotaph and water fountain.

Similarly, at Circular Quay plazas extend along the northern edge of the buildings on Alfred Street, widening into a forecourt plaza for the historic Treasury building. In this location the precinct is characterised by the bulk of the Cahill Expressway and City Circle railway line looming overhead, overshadowing the plaza spaces along Alfred Street and blocking views to Circular Quay and Sydney Harbour.

Intersecting with George Street, a number of streets are pedestrianised; incorporating trees and plaza spaces for public use. The most notable of these is Regimental Square on Wynyard Street, and the square connecting Sydney's Town Hall with St Andrews Cathedral. Regimental Square contains the Vietnam War Memorial and is an important pedestrian connection to the Wynyard Bus Interchange. Footpaths also widen into a plaza at the Queen Victoria Building where the Queen Victoria Statue grandly sits, visually punctuating the Street.

The Inner West Light Rail (IWRL) also intersects George Street at Hay Street in Chinatown, with the Capitol Square stop located just east of the intersection on Hay Street. It connects Central Station to the Convention Centre, Casino and Lilyfield in the west. Hay Street has been closed to traffic and pedestrianised. The light rail has overhead wires which are not visually prominent in views from George Street. The IWRL sets a visual precedent for light rail in this area of the CBD. The disused Monorail also intersects George Street at Market Street, adjacent to the QVB, and Liverpool Street at World Square, however, the Monorail will be removed prior to construction of the proposal.

Avenues of London Plane Trees (Platanus acerifolia) line George Street along much of its length, excluding an area between Hunter Street and Bathurst Street where the streetscape is constrained by width. In this area trees are found primarily in adjacent plazas and public squares. Between Alfred Street at Circular Quay and Hunter Street, trees are intermittent and of varying maturity and health. Between Bathurst Street and Rawson Place there is a more consistent avenue of street trees, however, again they have been planted at different times and are of varying maturity and health. Generally these street trees are not thriving and are in a highly constrained urban environment. The George Street Master plan (2012) refers to arboricultural advice with regard to the future of these trees. It has been determined that another species should be used to replace these trees over time, and where possible a more central location for trees (with more access to sunlight and rainfall) would be achieved through an extensive program of pedestrianisation.

To the south of this precinct, the McKell Building forecourt plaza, on the corner of Rawson Place and Pitt Street, provides the visual relief of trees and a place for workers to congregate at lunchtime. Due to its proximity to the city and Central Station, Belmore Park is a place for groups to gather for protests, markets, events and performances. The western edge of the park is defined by a roadway ramp leading to the concourse level of the train station at Eddy Avenue. The grand, national heritage listed Central Station, with its classical style façade and iconic 75 metre tall clock tower sit prominently in this part of town. The twin sandstone rail bridges which span Eddy Avenue enclose the forecourt of the station which incorporates an interstate coach terminal.

Chalmers Street forms the eastern edge of Central Station and marks the beginning of Surry Hills. There are two entries to Central Station on Chalmers Street, one at the intersection with Elizabeth and Foveaux Street and the second at Devonshire Street. At Foveaux Street, some mature London Plane trees and a small pocket park known as Elizabeth Street Garden, create a soft green foreground to the sandstone arched rail bridges of the station.

01 Town Hall looking north across Bathurst Street. Photography by HASSELL

02 Circular Quay Plaza. Photography by HASSELL

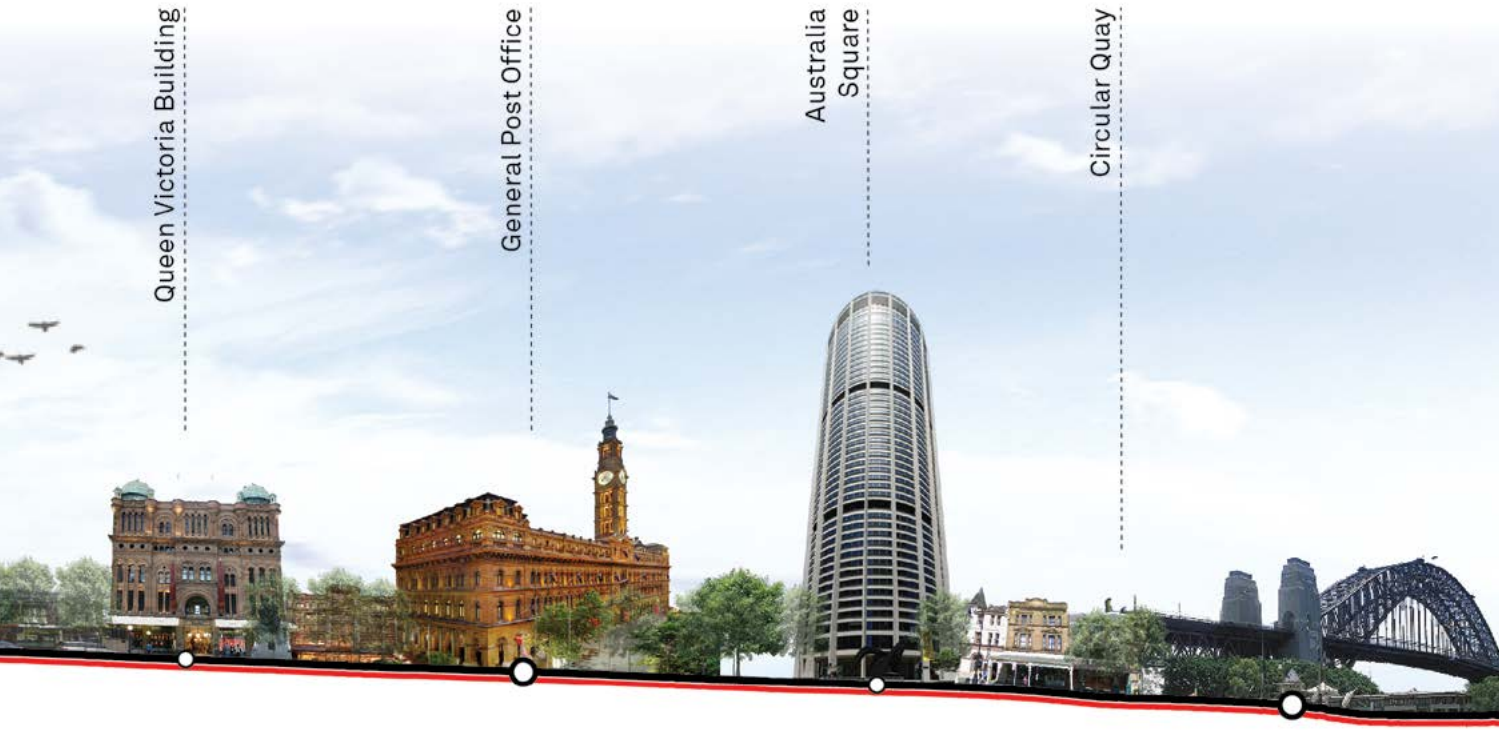
03 George Street at Queen Victoria Building. Photography by HASSELL

04 Central Station entrance along Chalmers Street. Photography by HASSELL

06 City Centre
Existing Character & Visual Conditions

Chalmers and Elizabeth Streets offer views to the CBD skyline including the iconic Sydney Tower. These views and the Central Station Bridge mark the south eastern entry to the City. This intersection is broad and complex, with the merging of five major roads and the funnelling of traffic under the rail bridge arches. Chalmers Street is a four lane one way road with broad footpaths and a plaza at the station. This plaza includes a row of statues dedicated to a number of Ibero-American heroes, opened in 1989.

The following illustrative section shows the key features along the light rail route and gives a sense of both the ground plane and skyline topography of the site.



Queen Victoria Building (George St)

Wynyard (George St)

Grosvenor St (George St)

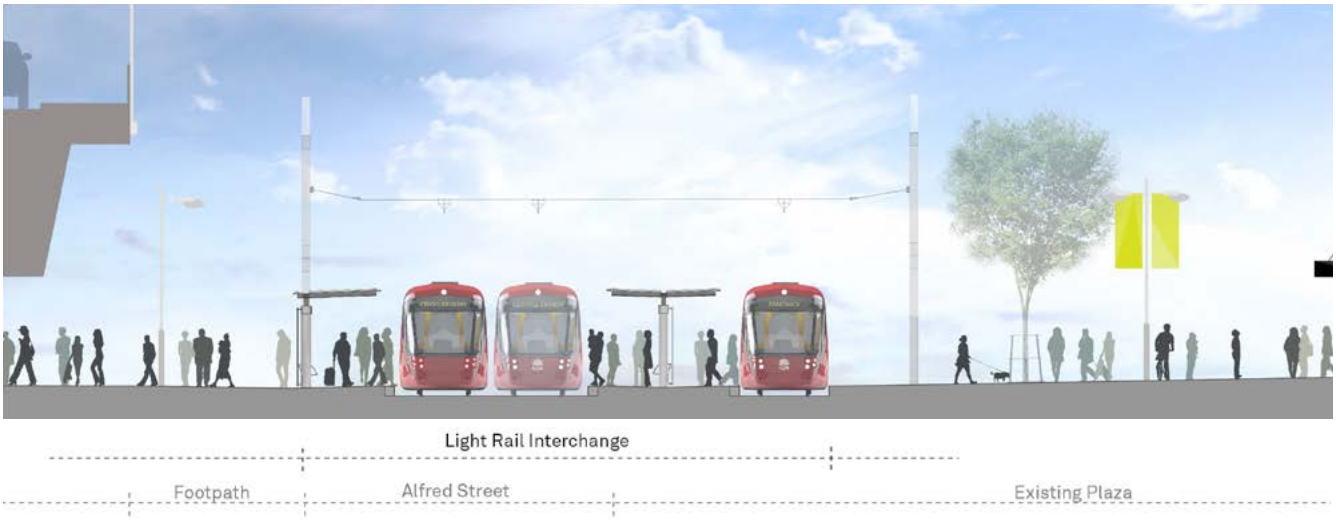
Circular Quay (George St)

6.4 Landscape and Visible Components of the Project

The following assessment is based on the current alignment design as described in the Environmental Impact Assessment. The treatments for each section of the alignment described in the following paragraphs.

Circular Quay
At Circular Quay, an interchange and stop would be located on Alfred Street, which becomes pedestrianised between George and Loftus streets. This concept supports the City of Sydney's broader principals of creating a new harbour square and gateway to the city at Circular Quay. The existing London Plane trees would be removed to make way for three railway spurs and a stop with a large canopy structure covering both platforms. These trees would be replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) and in consultation with the City of Sydney. A wire-free light rail system would be used, negating the need for overhead wires and poles so that the street would be considerably less visually cluttered with built elements. Wires would, however, be required at the stop for the full length of the platforms.

George Street, Alfred to Hunter Street
From Alfred Street, the route turns south onto George Street. On George Street, between Alfred and Hunter Streets, there would be typically one lane of traffic in each direction in addition to the light rail alignment running down the centre of the corridor. A wire-free light rail system would be used, negating the need for overhead wires and catenary structures so that the street would be considerably less visually cluttered with built elements. A light rail stop would be provided at Grosvenor Street. Although this treatment is wire-free along the corridor, the stops would require a catenary structure and overhead wires running the length of the stop. All of the existing London Plane trees along the route would be removed and replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) in consultation with the City of Sydney, in locations nearby as appropriate in a boulevard arrangement in accordance with City of Sydney's George Street Master plan.

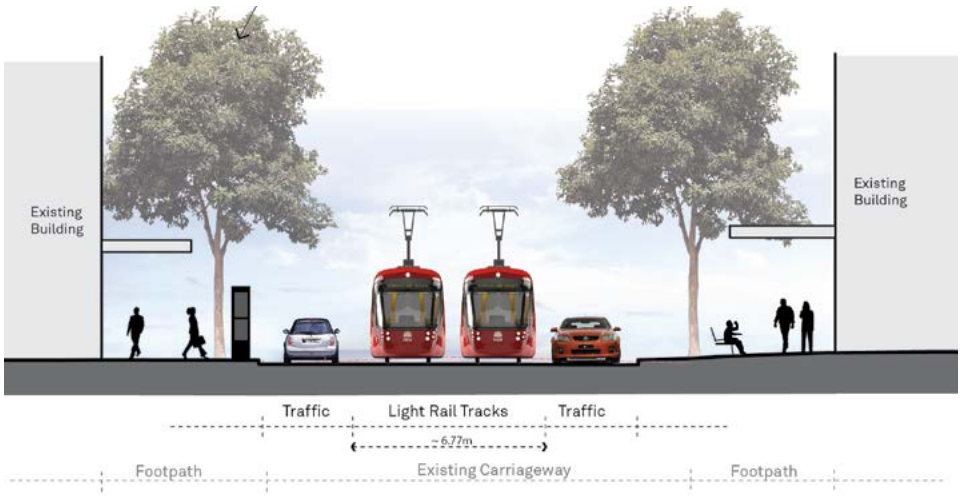


Typical Street Section of Circular Quay, Alfred St

George Street, Hunter to Bathurst Street
From Hunter Street south to Bathurst Street, traffic would be removed from George Street and the street would become a pedestrianised urban plaza. The wire-free light rail system continues in this area as the rail runs centrally along George Street within the plaza. With relocated services and a wire-free system the street would be considerably less visually cluttered with built elements. The design provides for a high level of public domain design quality, reflective of the prominence of this pedestrianised street within the CBD. Light rail stops would be built at Wynyard, Queen Victoria Building and Town Hall. At these stops catenary and wires would be required for the full length of the platform. All of the existing London Plane trees along the route would be removed and replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) in consultation with the City of Sydney, in locations nearby as appropriate in a boulevard arrangement in accordance with City of Sydney's George Street Master plan.

George Street, from Bathurst Street to Rawson Place
A more traditional approach to power supply is proposed between Bathurst Street and the rest of the network using catenary structures and overhead wires. The poles are proposed to be located to the sides of George Street, and street trees in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) in consultation with the City of Sydney, in locations where awnings and width allows, and in accordance with City of Sydney's George Street Master plan. There would be a minimum of one traffic lane in each direction, with some areas where the street widens to include an additional north bound lane. The light rail alignment runs centrally along the road with light rail stops at World Square and Chinatown. The stop at World Square would be an island platform, whereas the stop at Chinatown would include platforms either side of the line.

The existing inner west light rail (IWLR) alignment would intersect the new light rail alignment and would include the installation of two turnouts and signalling at the junction. The Chinatown light rail stop would provide the interchange between the two rail routes.



Typical Street Section of George St between Alfred & Hunter St

Rawson Place, Eddy Avenue to Chalmers Street

The alignment turns east at Rawson Place where there would be a light rail stop adjacent to the McKell Building forecourt plaza, on the corner with Pitt Street. The street trees on Rawson Place would be removed between George and Pitt streets. The station would include an iconic canopy structure, and platforms, LRVs and surrounding public realm elements would be replaced to create a plaza. Street trees would be replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) and in consultation with the City of Sydney, on the northern side of the stop, and a small number along the southern side where suitable.

At Central Station, two light rail lines widens into three at the Eddy Avenue Coach Stop. Three east and westbound traffic lanes would be maintained on Eddy Avenue. The light rail would be located on the southern side with the coach terminal moving to the northern side of Eddy Avenue. From Eddy Avenue the route turns on to Chalmers Street and creates an interchange and stop with an island and side platform to service high frequency events. Only a single general traffic lane would be provided along with a shared light rail/bus lane on Chalmers Street. Existing street trees would be removed from Chalmers Street to accommodate the light rail and road infrastructure. Catenary structures and overhead wires would follow the rail alignment with poles to be located at the sides of the streets. Throughout this area, catenary structures and overhead wires would follow the rail alignment with poles to be located at the sides of the street.

Construction

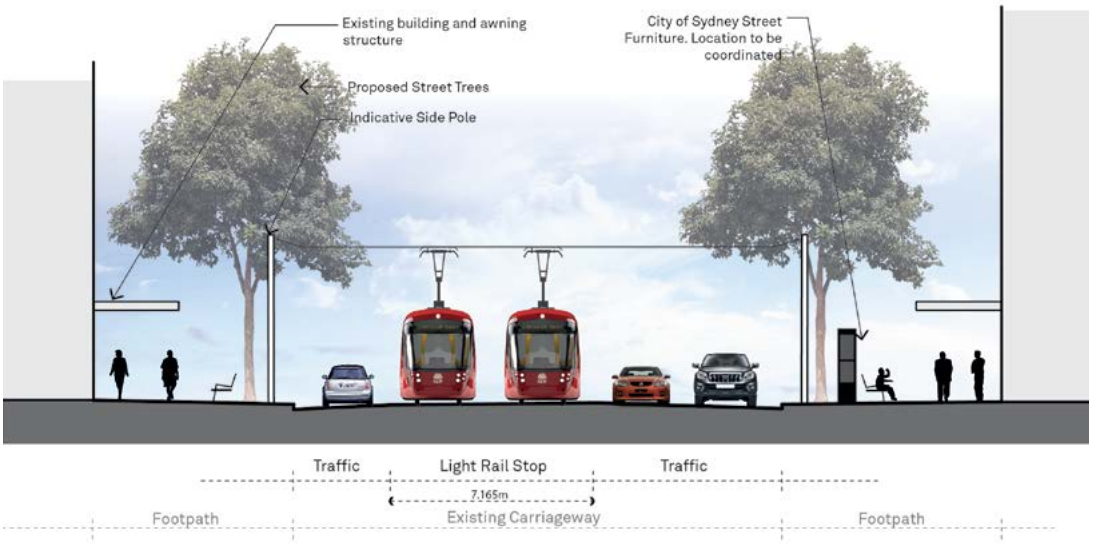
Construction of the proposal in this area would require early works including utility relocations, intersection modifications, preparatory works for the track slab construction and systems works. Alfred Street and its northern footpath would be closed to traffic between Pitt and George Streets. Intersection modifications would occur along the length of George Street and would include the removal of the turning lanes on Bathurst and King streets and closing streets such as Barrack Street, Wynyard Street and Angel Place. George Street, between Hunter Street and Town Hall, Rawson Place and its northern footpath, and Chalmers Street would be closed. Hay Street would be closed to traffic on the east side and the west light rail alignment, located on Hay Street, would be maintained for most of the duration of construction where possible.

Civil and systems works would begin with the preparation and construction of the track slab and rail installation. Track construction would occur in linear sections between intersecting streets, with the intersections being constructed separately during weekends. Each section would be established as a site with traffic lanes diverted, temporary hoardings and barriers.

Track work on the George Street section is expected to use an Apitrax system with work progressing from south to north progressively through the CBD. To the south of the precinct slip track techniques may be used. The track work between Chalmers Street to Eddy Avenue would be predominately handwork. Track work would be followed by construction of the stop platforms, canopies, reinstatement of pavements and erection of catenary structures, wires as required.

Equipment used that may be seen during construction throughout the precinct includes Apitrax and slip track machinery, cherry pickers, mobile cranes and 6-wheel tip trucks. Generally, areas of hand work would require equipment that would be less visually prominent.

Construction of the CSELR proposal is expected to commence in mid-2014 (subject to planning approval) and is anticipated to take approximately five to



Typical Street Section of George St, between Bathurst street and Hunter Street

six years to complete. The proposal is expected to be commissioned (i.e. operational) in 2019–2020. This program is based on the current design and construction staging. Therefore, the program is indicative only and may change once the construction contractor(s) is engaged.

It is proposed that the northern Construction Site Compound Area (CSCA) be located on the grounds of the First Fleet Park and an area under the Cahill Expressway adjacent to Alfred Street. The northern boundary would be located approximately 17m from the MCA, clear of an existing footpath between the Quay and George Street, and continuity of the promenade around the Quay would not be impacted. This site would cover an area of approximately 2400m^2 and contain site offices, equipment storage, laydown area and workshop subject to heritage constraints. The CSCA would be accessed by heavy vehicles via Alfred Street under the Cahill Expressway.

A Substation Site Compound is proposed to be located at the western end of Martin Place. The substation works would be predominately civil works including excavation and foundation preparations to allow for the off site manufactured substation to be placed on site.

The main southern Construction Site Compound Area (CSCA) would be located at Belmore Park, adjacent to Hay Street. This site would be located between existing footpaths and cover an area of approximately 3200m^2. This Compound would contain site offices, equipment storage, a laydown area and workshop, and will not require the removal of trees within the park. The Central Station and George Street construction areas would access the CSCA via the existing pedestrianised IWRL corridor between George and Pitt Street. The IWRL signals would be modified so that the corridor can be shared. This proposed access via Hay Street may require removal of street trees. In addition, a site facility of approximately 250m^2 is proposed near the north east corner of George and Hay Street including a site container.

Typical Street Section though Central Station Stop along Chalmers Street

6.5 Sensitivity Levels

The sensitivity of the precinct is predominantly influenced by a number of historic properties and iconic views. As well as the multitude of historic and modern iconic landmark locations and buildings, the precinct includes areas which are national and international tourist destinations. The following list summarises the assessment of visual sensitivity for the main viewing areas across the study area:

- The harbour-side areas of Circular Quay, including First Fleet Park, have significant historic and cultural importance to the nation. This park is the original landing place of the First Fleet in 1788, and an early contact site with the indigenous Cadigal people. The park is a break out space for The Rocks and forecourt to the Museum of Contemporary Art (MCA). It is well known as a place for appreciating views to the Harbour Bridge, and across the waters of Sydney Cove to the World Heritage Listed Sydney Opera House. The landscape and visual amenity values of this area are considered to be of **state sensitivity** as they are iconic to the state.
- The landscape and visual amenity of Circular Quay, south of the Cahill Expressway, is considered to be of **state sensitivity** as this place is iconic to the state. Although this location is just beyond the visual curtilage of the World Heritage Listed Sydney Opera House, and with limited views from street level to the harbour and bridge itself, this area is used by tourists as a gateway to the Harbour.
- George Street, between Alfred and Hunter streets, acts as a gateway to the Circular Quay precinct and therefore is used by a large number of tourists and city workers alike. There are glimpse views to the harbour and Harbour Bridge at the northern end; however, views within the corridor are largely to modern hotels and office buildings including the iconic high-rise towers of Australia Square and National Australia Bank House. Landscape features and views in this area are considered to be of **regional sensitivity** as they are important to the city of Sydney.
- George Street, between Hunter and Bathurst streets, includes a number of buildings and public domain areas that are icons within the city of Sydney. These include: the General Post Office and Bank buildings at Martin Place, the Queen Victoria Building, Sydney Town Hall, and The Strand Arcade. A number of these buildings are state heritage listed and are important to both the city of Sydney and state as a whole. The landscape features and views in this area are considered to be of **state sensitivity**.
- George Street, from Bathurst Street to Rawson Place, generally has a slightly lower visual sensitivity. Along much of the route there is a mixed quality of architecture, with historic corner buildings, the Capitol Square Hotel and Central Baptist Church, HSBC high-rise tower and World Square Tower for example creating visual interest and characterising localised views. The landscape features and views in this area are considered to be of **regional sensitivity.**
- The landscape and views of Central Station where it fronts Eddy Avenue are considered to be of **state visual sensitivity. The** visually prominent historic building and Clock Tower are heritage listed and located at the busiest railway station in the State and a main arrival points for Sydney. This area also includes Elizabeth Street Garden, a landscaped park on the Corner of Eddy and Elizabeth Street, as this site is considered to form a part of the Central Station grounds, and is identified in the Central Station Conservation Management Plan (1995) as having high significance as a townscape element.
- Chalmers Street is considered to have landscape and visual amenity of **regional sensitivity** as it includes an entry to Central Station, and a plaza containing commemorative statues dedicated to a number of Ibero-American heroes.

These sensitivity levels will be used consistently throughout the following assessment.

6.5 Assessment of Landscape Impacts

The landscapes within this precinct identified as potentially being impacted by the proposal are the:

1. First Fleet Park, Circular Quay
2. Herald Plaza on Alfred Street, Circular Quay
3. Regimental Square at Wynyard Street
4. Martin Place
5. Queen Victoria Statue and Plaza
6. Town Hall and St Andrews Cathedral Square
7. Street trees on George Street
8. McKell Building forecourt plaza, corner of Rawson Place and Pitt Street
9. Belmore Park
10. Elizabeth Street Gardens
11. Ibero-American Statue Plaza

The following sections summarise the impacts identified by the landscape assessment and site visit observations. This includes impacts during construction and operation. Where the a duration of impact is relevant it has been noted.

0 100 200 400m

First Fleet Park, Circular Quay

During construction a small part of First Fleet Park would be used as a construction site; the work site would be enclosed by visually opaque hoarding, and be accessed by heavy trucks and machinery as required. This would displace the users of the park for the duration of construction and impact the functionality of this area of the Quay. The flow of pedestrian movement around Circular Quay would also be impacted somewhat although circulation around the site would be maintained and some visual connectivity with the Sydney Opera House and legibility in this precinct is likely to be reduced.

Construction Assessment
For this reason, it is expected that there would be a considerable reduction in the landscape quality of this landscape feature of state sensitivity, resulting in a **very high adverse landscape impact** during construction.

During operation, the function of this plaza would be improved to suit the needs of the community and surrounding site uses. The Sydney Harbour Foreshore Authority has a master plan to refresh this park, to change its function so that it suits the gathering and event space function that it serves in this important precinct of the City. Relationships with surrounding buildings such as the MCA and footpath continuity would be improved with complex levels simplified. These changes are compatible with the surrounding urban landscape and Circular Quay plaza vision that has been established by the Sydney Harbour Foreshore Authority.

Operations Assessment
For this reason it is expected that the proposal would create a noticeable improvement to the quality of this landscape feature, which is of state sensitivity. This results in a **high beneficial landscape impact** during operation.

Herald Plaza on Alfred Street, Circular Quay (George to Loftus street)
During construction, a large portion of the existing plaza would be required for construction, requiring the removal of the existing London Plane trees, Tank Stream Fountain water feature and plaza furnishings; the work site would be enclosed by visually opaque hoarding. It is likely that the flow of pedestrian movement across Alfred Street would be diverted around the site, so that some visual connectivity and legibility in this precinct may be impacted. Users of this plaza would be displaced and visual softening afforded by the mature vegetation lost.

Construction Assessment
It is expected that there would be a noticeable reduction in landscape quality of this landscape feature of state sensitivity, resulting in a **high adverse landscape impact** during construction.

The function of this plaza would be maintained and improved during operation of the proposal. Building thresholds and entries and footpath continuity would not be adversely affected and although there would be a number of mature trees removed, the overall size of the plaza would be increased. An iconic canopy structure would become a visual marker, identifying the stop. LRVs would be seen approaching, departing and stationary at the stop and would be somewhat similar to character of the road and public transport networks which characterise this area. These changes are compatible with the surrounding urban landscape and Circular Quay plaza vision that has been established by the City of Sydney.

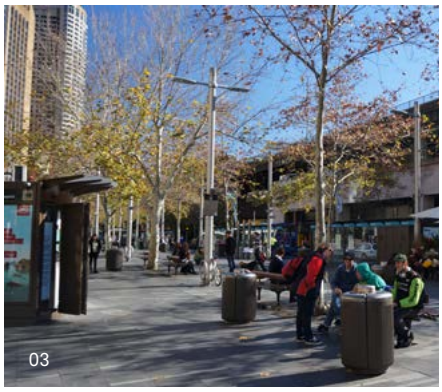
Operations Assessment
It is expected that the proposal would create a noticeable improvement to the to this landscape feature, which is of state sensitivity. This results in a **high beneficial landscape impact** during operation.

01 Image of Customs Square. Photography by HASSELL

02 Image of the Tank Stream Fountain. Photography by HASSELL

03 Image looking across public plaza along Alfred Street. HASSELL

04 Illustrative Concept plan of Circular Quay



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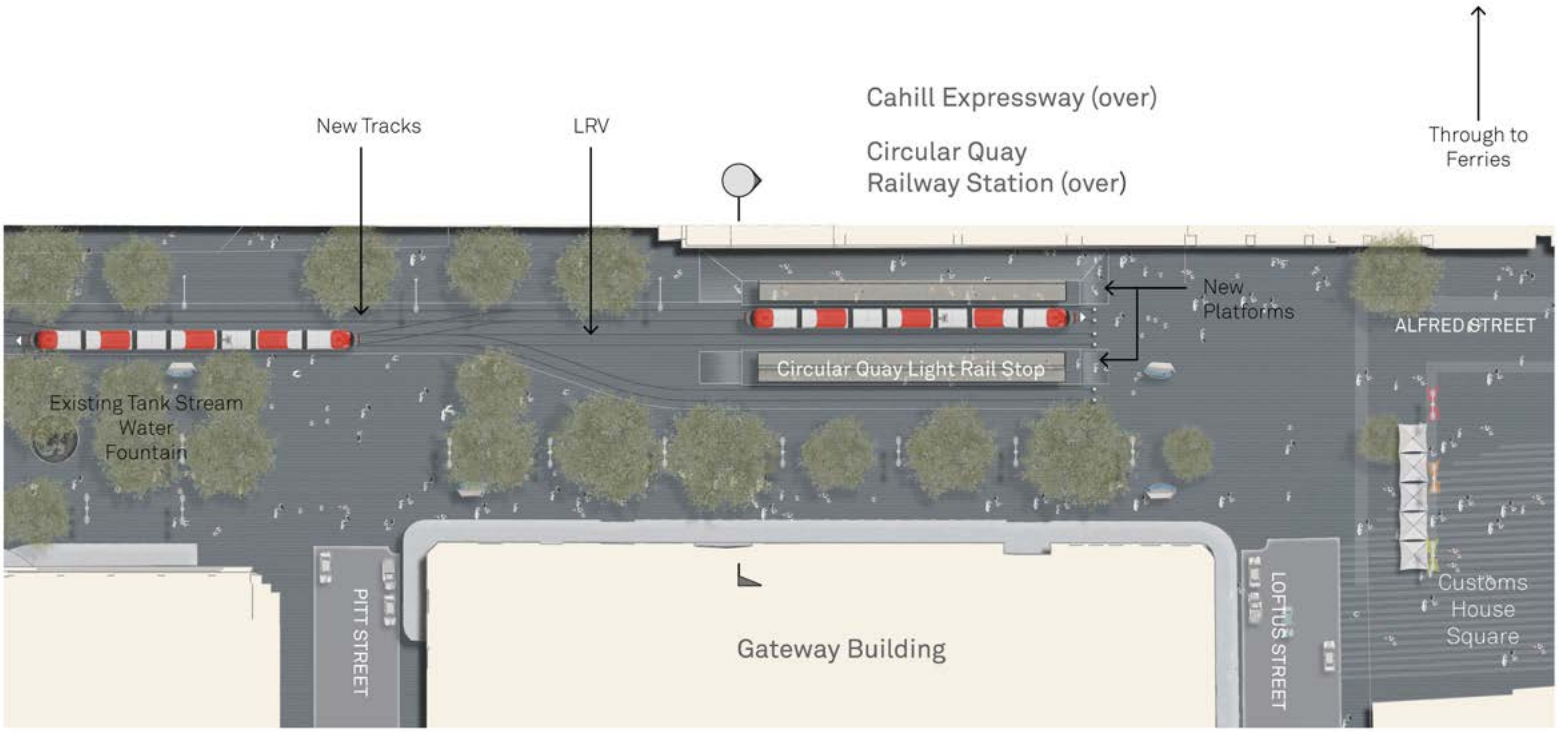


Regimental Square at Wynyard Street

During construction, Regimental Square and the Vietnam War Memorial would not be impacted directly by the proposal. However, when construction works are occurring on George Street, adjacent to the square, much of the street would become a construction site. It is likely that the flow of pedestrian movement accessing the square from the east would be diverted so that some visual connectivity and legibility in this precinct may be impacted.

Construction Assessment
It is expected that there would be a noticeable reduction in the landscape quality of this landscape feature of regional sensitivity. This results in a **moderate adverse landscape impact** during construction.

There would not be any change in the character or function of this square during operation. Building thresholds and entries and footpath continuity would be restored and it is not expected that any trees would be removed.

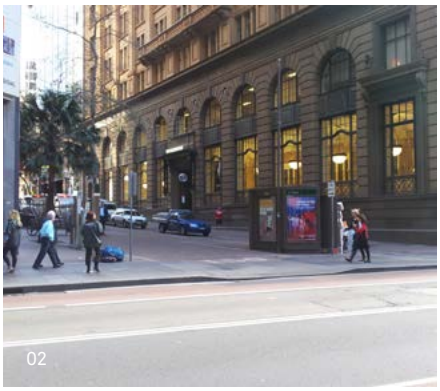
Operations Assessment
For this reason the proposal creates no perceived change to this landscape feature, which is of regional sensitivity. This results in a **negligible landscape impact** during operation.

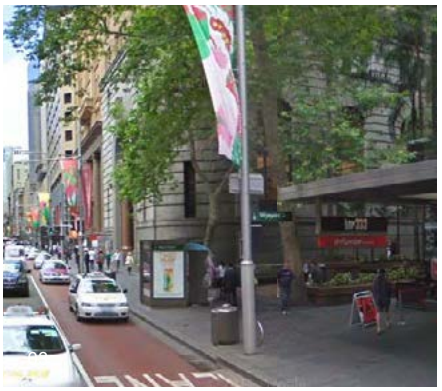
01 Hunter Street Connection adjacent on George Street. Photography by HASSELL

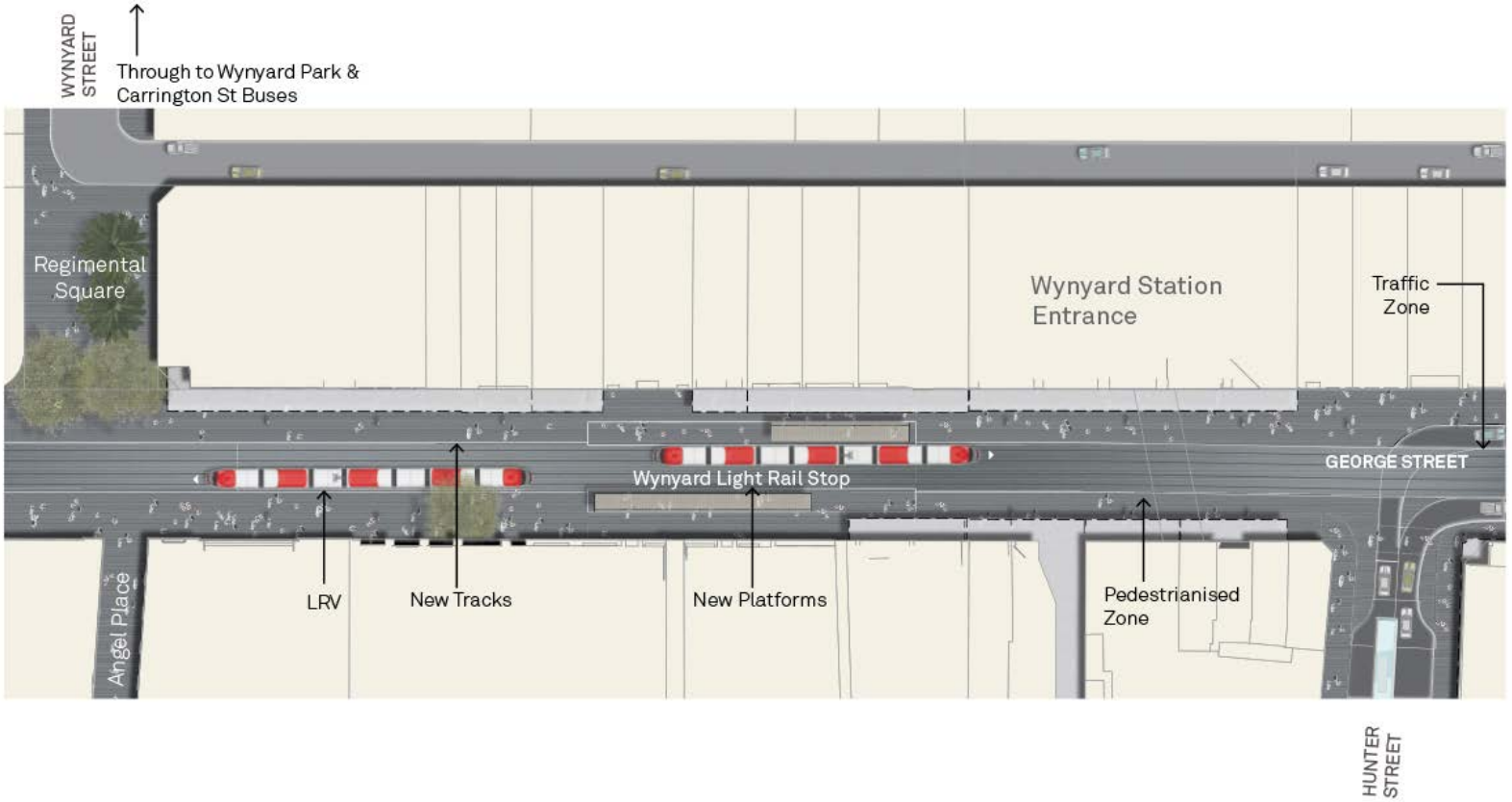
02 Image along George Street. Photography by HASSELL

03 Pedestrianised Plaza at Wynyard Street. Photography by Google Street View

04 Illustrative concept plan of Wynyard







04

0 5 10 20m

Martin Place

During construction a substation would be located underground at the western end of the plaza. This would displace users and may alter building access, circulation and the type of activities that can occur at the end of the plaza during construction. Furthermore, when construction works are occurring on George Street, adjacent to Martin Place, much of George Street would become a construction site and would be enclosed by hoarding. It is likely that the flow of pedestrian movement accessing Martin Place from the west would be diverted around the site, so that some visual connectivity and legibility in this precinct may be impacted.

Construction Assessment
For these reasons, it is expected that there would be a considerable reduction in the quality of a landscape feature of state sensitivity, resulting in a **very high adverse landscape impact** during construction.

The function of this plaza would be maintained during operation of the proposal. Any impacts on building entries and footpath continuity, occurring during construction, would be restored and it is not expected that any trees would be removed. As George Street is pedestrianised this would somewhat expand the plaza and improve pedestrian connectivity at its western end.

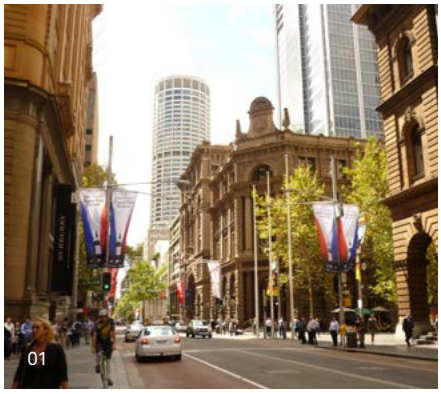
Operations Assessment
For this reason there is expected that there would be a noticeable improvement to this landscape feature, which is of state sensitivity, resulting in a **high beneficial impact** during operation.

01 George Street looking north at Martin Place. Photography by HASSELL

02 Martin Place. Photography by HASSELL

03 George Street looking south at Martin Place. Photography by Google Street View

04 Illustrative concept plan of Martin Place



04

Queen Victoria Statue and Plaza

During construction the statue and plaza are not expected to be impacted directly. However, when construction works are occurring on George Street, adjacent to this plaza, much of the street would become a construction site and would be enclosed by hoarding. It is likely that the flow of pedestrian movement around the QVB and this plaza space would be altered to divert around the construction site. In this case some visual connectivity and legibility of this plaza space may be impacted.

Construction Assessment
It is expected that there would be a noticeable reduction in the quality of this landscape feature of state sensitivity, and consequently there is expected to be a **high adverse landscape impact** during construction.

The function of this plaza would be maintained during the operation of the proposal. Any impacts on building entries and footpath continuity, occurring during construction, would be restored. As George Street is pedestrianised in this area, this would essentially expand the plaza, reduce visual clutter around this intersection and improve the statues prominence at the forecourt to the QVB. In the future it is expected that trees would be introduced along this stretch of George Street, in accordance with the City of Sydney's vision. The project would provide improvements to the quality of the public realm overall as new pavements and street furnishings are installed. These changes are compatible with the surrounding urban landscape, City of Sydney's vision for George Street, and future plans for an expanded square for Sydney's Town Hall.

Operations Assessment
It is therefore expected that the proposal would create a noticeable improvement to this landscape feature, which is of state sensitivity. This results in a **high beneficial landscape impact** during operation.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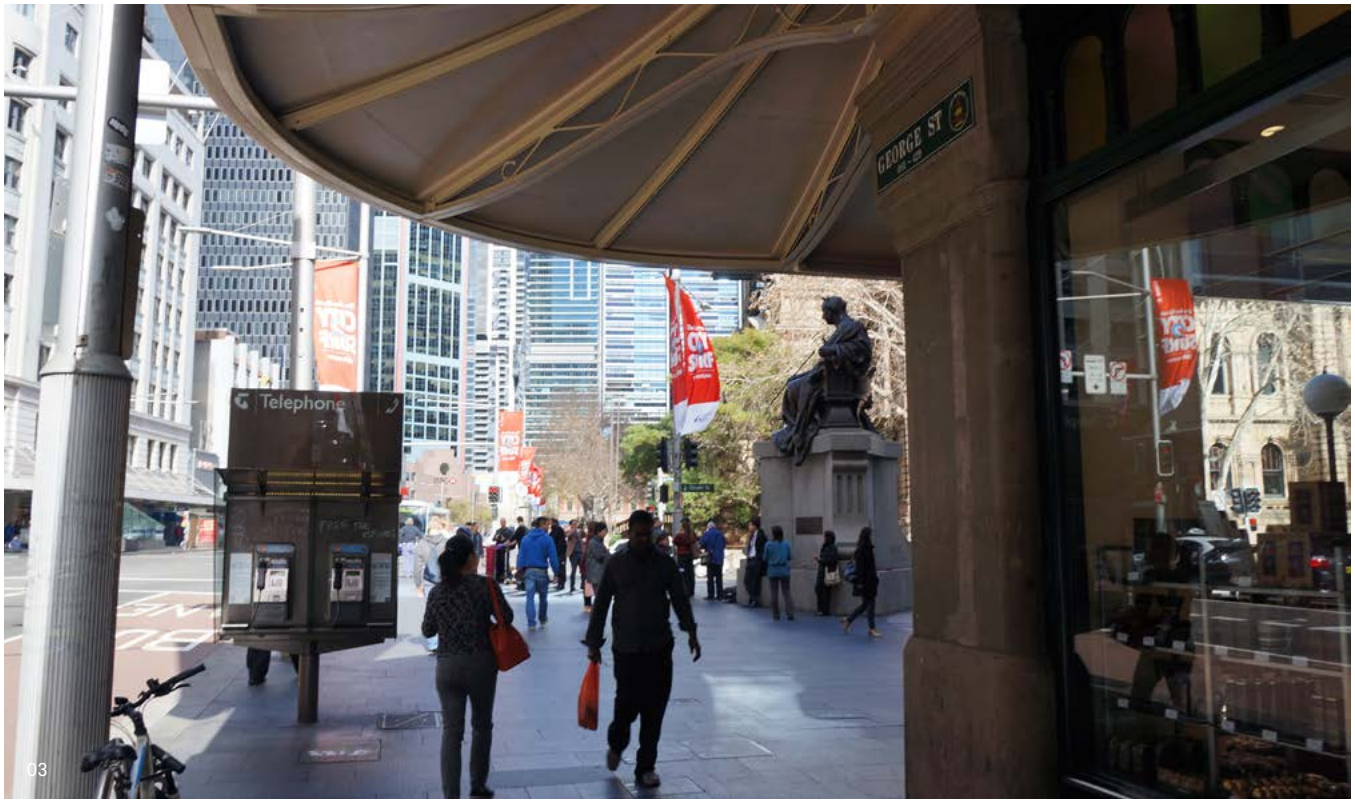


03


04

01 Queen Victoria Statue.
Photography by HASSELL

02 Queen Victoria Plaza in context with Town Hall and QVB.
Photography by HASSELL

03 Approach to Queen Victoria Statue and Plaza from the QVB.
Photography by HASSELL

04 Character Image of Queen Victoria Building.
Photography by HASSELL

Town Hall and St Andrews Cathedral Square

During construction this plaza is not expected to be impacted directly. However, when construction works are occurring on George Street, adjacent to this plaza, much of the street would become a construction site and would be enclosed by hoarding. It is likely that access to the plaza, Town Hall and Town Hall Station may be impacted as the flow of pedestrian movement is diverted around the construction site. In this case some visual connectivity and legibility of this plaza space may be impacted.

Construction Assessment
It is expected that there would be a noticeable reduction in the quality of this landscape feature of state sensitivity, and consequently a **high adverse landscape impact** during construction.

The function of this plaza would be maintained and improved during operation of the proposal. Currently this space sits adjacent to the Town Hall, and the visual prominence of this important building is understated due to the visual and physical clutter of the busy traffic on George Street. Any impacts on building entries and footpath continuity, occurring during construction, would be restored and George Street would become pedestrianised creating an expanded plaza and more functional gathering space and forecourt to Town Hall. In the future it is expected that trees would be introduced along this stretch of George Street, in accordance with the City of Sydney's vision. The project would provide improvements to the quality of the public realm overall as new pavements and street furnishings are installed. These changes are compatible with the surrounding urban landscape and City of Sydney's vision for George Street, and future plans for an expanded square for Sydney's Town Hall.

Operations Assessment
The proposal would create a considerable improvement to this landscape feature, which is of state sensitivity. This results in a **very high beneficial landscape impact** during operation.

Street trees on George Street

On George Street, street trees are located between Alfred Street and Hunter Street; and then between Bathurst Street and Rawson Place. At some stage during construction each part of George Street would become a construction site. At this time all trees along George Street would be removed. This constitutes a total of approximately 130 London Plane trees (Platanus acerifolia) of mixed maturity and health.

Construction Assessment
It is expected that there would be a noticeable reduction in the quality of a landscape feature of regional and state sensitivity, resulting in a **moderate to high adverse landscape impact** during construction.

During operation trees would be replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013), in consultation with the City of Sydney, and located in accordance with the City of Sydney's vision for George Street. Although the existing mature trees would be replaced with smaller, younger trees, this planting would contribute considerably to the proposed new boulevard of Japanese Elm trees (Zelkova serrata) planned to extend along the full length of George Street. These changes are compatible with the surrounding urban landscape and City of Sydney's vision for George Street.

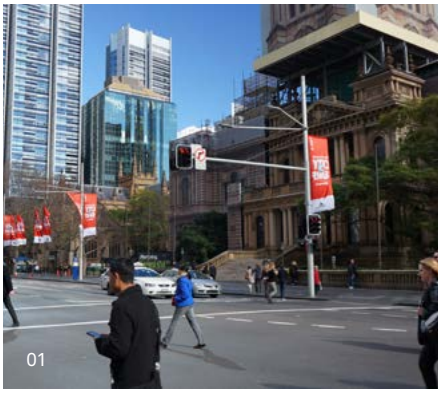
Operations Assessment
It is therefore expected that the proposal would create a noticeable improvement to this landscape feature of regional and state sensitivity. This results in a **moderate to high beneficial landscape impact** during operation.

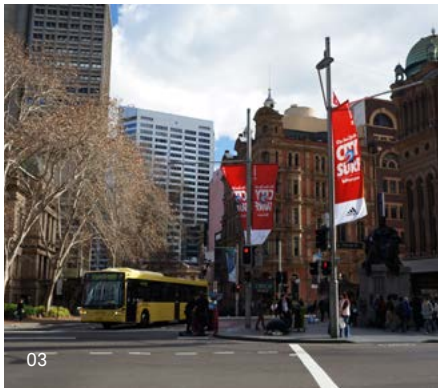
01 Town Hall Building. Photography by HASSELL

02 St Andrews Cathedral. Photography by HASSELL

03 View west along Druitt Street towards the QVB and Town Hall. Photography by Google HASSELL

04 Illustrative concept plan of Town Hall





04

0 5 10 20m

McKell Building forecourt plaza, Corner of Rawson Place and Pitt Street

The McKell building forecourt plaza would not be directly impacted by the proposal during construction. However, much of Rawson Place would become a construction site as an interchange and stop is developed in this location. This would require the removal of the existing semi-mature street trees located on Rawson Place. The site would be enclosed by visually opaque hoarding and it is likely that the flow of pedestrians along and through Rawson Place would be diverted around the work site and access to the plaza may be altered. The visual connectivity and legibility of this part of the precinct would be impacted. Views from this elevated plaza and the general amenity for users would be impacted as its southern boundary becomes a construction site.

Construction Assessment
During construction it is expected that there would be a noticeable reduction in the landscape quality of this regional sensitivity landscape feature. Overall, there is expected to be a **moderate adverse landscape impact** during construction.

The function of this plaza would be maintained during operation of the proposal. Any impacts on building entries and footpath continuity, occurring during construction, would be restored. There is a gradual rise along Rawson Place from George Street to Eddy Avenue and the development of the stop would require the installation of a number of ramps and handrails to maintain pedestrian accessibility. As a result, there may be some adverse effect on building thresholds and entries as well as some additional clutter. The removed street trees would be replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) in consultation with the City of Sydney. An iconic canopy structure would be a visual marker, identifying the stop, set below the plaza level. These elements would intervene in views to Central Station and the sandstone bridges which characterise the eastern end of Rawson Place. Generally, these changes are compatible with the surrounding urban landscape.

Operations Assessment
It is expected that the proposal would not create a noticeable improvement or reduction in the quality of this landscape feature, which is of regional sensitivity. This results in a **negligible landscape impact** during operation.

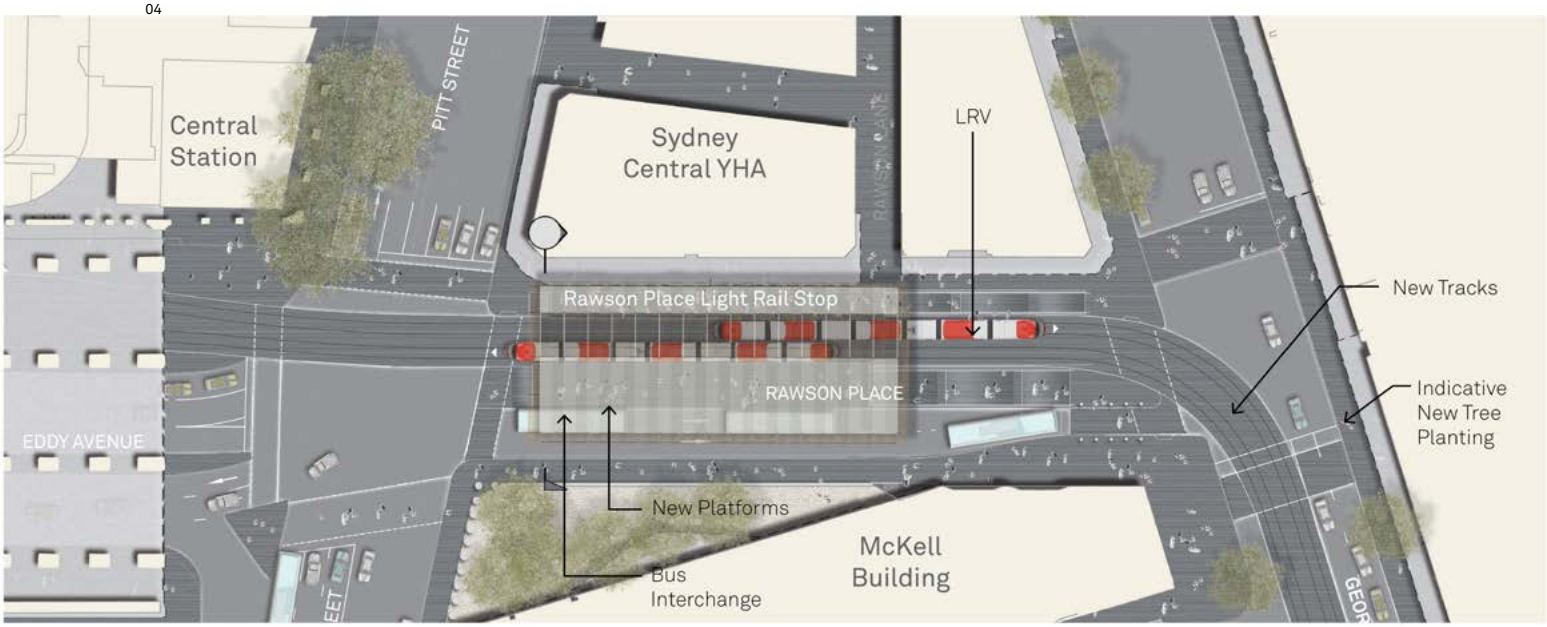
01 View towards Rawson Place and the McKell Building from George Street. Photography by HASSELL

02 View alongside the McKell Building. Photography by HASSELL

03 McKell Building Forecourt along Pitt Street . Photography by Google Street View

04 Illustrative concept plan of Rawson Place

04



Belmore Park

Belmore Park would be directly impacted by the proposal during construction. A large area of the park, adjacent to Hay Street, would become a construction site supporting the southern CBD precinct works. It is likely that to accommodate this work site some significant mature trees would be removed, park users would be displaced and activities suitable for this area of the park would be changed. The site would be enclosed by fencing, and heavy vehicles and machinery would be accessing the site from Hay Street. It is likely that pedestrian movement would be diverted around the site so that the connectivity and legibility of this precinct would be impacted.

Construction Assessment
As a result, it is expected that there would be a considerable reduction in landscape quality of this state sensitivity landscape feature. Overall, there is expected to be a **very high adverse landscape impact** during construction.

The function of this park would be restored for the operation of the proposal. As a result, there may be some improvements to the park as new planting and lawns would be implemented in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) and in consultation with the City of Sydney.

Operations Assessment
It is expected that the proposal would create no noticeable reduction or improvement in the quality of this landscape feature, which is of state sensitivity. This results in a **negligible landscape impact** during operation.

01 View along Eddy Avenue of Belmore Park.
Photography by HASSELL

02 View along Elizabeth Street of Belmore Park.
Photography by HASSELL

03 View along Eddy Avenue of Belmore Park.
Photography by HASSELL

04 View along Eddy Avenue of Belmore Park.
Photography by HASSELL

Elizabeth Street Gardens

During construction part of this pocket park would be incorporated into a work site for construction of the proposal. Users of this park would be displaced and the flow of pedestrian movements along Chalmers Street would be diverted around the site, so that visual connectivity and legibility of footpaths to Eddy and Elizabeth streets would be impacted.

Construction Assessment
For this reason, it is expected there would be a noticeable reduction in quality of a landscape feature of state level sensitivity, resulting in a **high adverse landscape impact** during construction.

The function of the park would be changed as the size of the garden would be reduced somewhat, and there would be a loss of four mature trees. This park is within the curtilage of the Central Station, and provides a green setting for the sandstone bridge. The overall public realm upgrade would restore the remaining parkland and pedestrian connections.

Operations Assessment
Due to the loss of trees and reduced size of this park it is expected that the proposal would create a noticeable reduction in the quality of this landscape feature of state sensitivity. This results in a **high adverse impact landscape impact** during operation.

Ibero-American Statue Plaza

During construction part of the plaza and forecourt entrance to Central Station would be used to accommodate a site compound for a substation. Following this, a portion of the plaza would be incorporated into a work site for construction of the proposal, surrounded by hoarding. This work is likely to both directly and indirectly affect the quality of this landscape with the flow of pedestrian movements along Chalmers Street in this location diverted away from the site, so that visual connectivity and the ability to view and appreciate the statues in their setting would be impacted.

Construction Assessment
For this reason, it is expected there would be a noticeable reduction in quality of a landscape feature of regional level sensitivity, resulting in a **moderate adverse landscape impact** during construction.

The function of the Ibero-American statue plaza would be improved with a range of public realm works during the operation of the proposal. Two of the statues would require relocation, the size of the plaza would be reduced somewhat, and there would be a loss of approximately 30 existing trees. However, the overall public realm upgrade would restore the setting of the statues with higher quality design and materials and introduction of a small number of new street trees, located where space permits.

Operations Assessment
These changes are generally compatible with the surrounding urban landscape. For this reason it is expected that the proposal would not create a noticeable change to this landscape feature, which is of regional sensitivity. This results in a **negligible landscape impact during** operation.

01 View of Ibero-American Statues and plaza outside Central Station. Photography by HASSELL

02 View of Ibero-American Statues and plaza outside Central Station. Photography by HASSELL

03 View of park cnr Eddy Ave and Elizabeth Street. Photography by HASSELL

04 View from park to Central Station Entry. Photography by HASSELL

6.7 Assessment of Daytime Visual Impacts

Selection of Representative Viewpoints
Site visits were undertaken during June and July of 2013. The following viewpoints were selected as representative of the range of views to the site and the proposed development:

Circular Quay
_View 1-1: Alfred Street, Circular Quay

George Street, Alfred to Hunter Street
_View 1-2: George Street, view north near the corner with Jamison Street

George Street, Hunter to Bathurst Street
_View 1-3: George Street, view south at the corner with King Street
_View 1-4: George Street, view south at the corner with Market Street
_View 1-5: George Street, view north at Town Hall

Rawson Place, Eddy Avenue to Chalmers Street
_View 1-6: George Street, view north at World Square
_View 1-7: George Street, view north east to Hay Street

Rawson Place to Central Station
_View 1-8: Rawson Place, view toward Central Station
_View 1-9: Eddy Avenue, view west at Central Station
_View 1-10: Chalmers Street, view north along Chalmers Street

Assessment of Representative Viewpoints
The following section summarise the daytime visual impacts identified in the representative viewpoint assessment and site visit observations.

0 100 200 400m

Circular Quay

View 1-1: Alfred Street, Circular Quay
In this location the study area is characterised by the bulk of the Cahill Expressway overshadowing the plaza spaces along Alfred Street, and City Circle railway line, blocking views to Circular Quay and Sydney Harbour. Despite the proximity, there are no notable views to the Opera House or Sydney Harbour Bridge from this location due to these physical and visual barriers. Viewpoint 1-1 is representative of views from the plaza on Alfred Street towards the proposed light rail transit station.

During construction, this view would change as service relocations begin, and the existing mature London plane trees are removed. This impact would be more substantial as the view becomes focused on a construction work site which would extend across the view. The site would be enclosed in visually opaque hoarding restricting visibility around the site. Overall, the view would be less green and a more constrained public realm. The scale and mass of the work site are not visually consistent with the character of this area and surrounding urban landscape of Circular Quay.

Construction Assessment
It is expected that the proposal would create a considerable reduction in visual amenity, resulting in a **very high adverse visual impact**, during the construction period. The construction period for the CSELR project is anticipated to take approximately five to six years.

During operation, traffic would be removed from this view and the site would be pedestrianised. The interchange stop would be visible in the centre of the view, with LRVs, platforms and an iconic canopy structure that would extend over the stop. New plaza trees would be would be replaced, although these would be of smaller size and maturity to the existing trees seen currently in this view. LRVs would be seen moving through this view, approaching and departing as well as stationary at the stop. The LRVs would have a visual envelope extending for up to 45m, and would be visually prominent due their length and scale. This proposal is visually compatible with the surrounding urban landscape and Circular Quay plaza vision that has been established by the City of Sydney.

Operations Assessment
For this reason it is expected that the proposal would create a noticeable improvement to the visual amenity of the view, which is of state visual sensitivity. This results in a **high beneficial visual impact** during operation.

View 1-1: Alfred Street, Circular Quay

George Street, Alfred to Hunter Street

View 1-2: George Street, view north near the corner with Jamison Street
In this location the study area is characterised by high-rise developments including Australia Square, the Hilton Hotel and Grosvenor Place. This built form channels views along the street, where the eye is drawn upwards to the towers overhead. The street level is visually active with four lanes of traffic, light poles with banners, street furniture and public plaza spaces. Despite the proximity to Circular Quay, there are limited views to the Sydney Harbour Bridge from this location due to this density of urban development intervening at the terminus of this view. Viewpoint 1-2 is representative of views from along George Street between Alfred and Hunter streets.

During construction this view would change as service relocations begin, and then more substantially as the view becomes focused on a construction work site. The work site would comprise much of the ground plane of the view and block views to the lower levels of buildings on George Street, channelling views along the footpath. These changes to the view are not visually consistent with the character of this area and surrounding urban landscape of George Street.

Construction Assessment
It is expected that the proposal would create a considerable reduction in the visual amenity of a view of regional visual sensitivity, resulting in a **high adverse visual impact.** The construction period for the CSELR project is anticipated to take approximately five to six years.

In this view the traffic would be removed and a wire-free light rail corridor would be located centrally in George Street. The Grosvenor Street stop would be central to the view and include catenary structures and wires over the full length of the stop platform area, returning some overhead visual clutter at street level. LRVs would be seen moving through this view, approaching and departing as well as stationary at the stop. The LRVs would have a visual envelope extending for up to 45m, and would be visually prominent due their length and scale. As a part of the proposal, the existing street trees would be removed and replaced in accordance with the Transport for NSW 'Vegetation Offset Guide' (TfNSW 2013) in consultation with the City of Sydney and located in accordance with the City of Sydney's George Street Master plan. These trees would be visible in the background of the view, beyond the stop infrastructure, and not provide any noticeable filtering of this view. Beyond the station, the light rail would be wire-free and add minimal elements to the view.

Operations Assessment
As traffic would be replaced with rail, it is expected that the proposal would be of similar visual character to that which currently exists and that there would be no noticeable change to the amenity of these views overall.
From views in this area, which are of regional sensitivity, it is expected that the visual impact of the proposal during operation would be **negligible.**

View 1-2: George Street, view north near the corner with Jamison Street