

An aerial photograph of a city street scene. In the foreground, a tram with a red and white livery is stopped at a station platform. A large number of pedestrians are walking across the street and on the sidewalks. In the background, there is a multi-story building and a bridge with a car on it. The sky is clear and blue.

**CBD AND SOUTH EAST LIGHT RAIL PROJECT
ENVIRONMENTAL IMPACT STATEMENT**

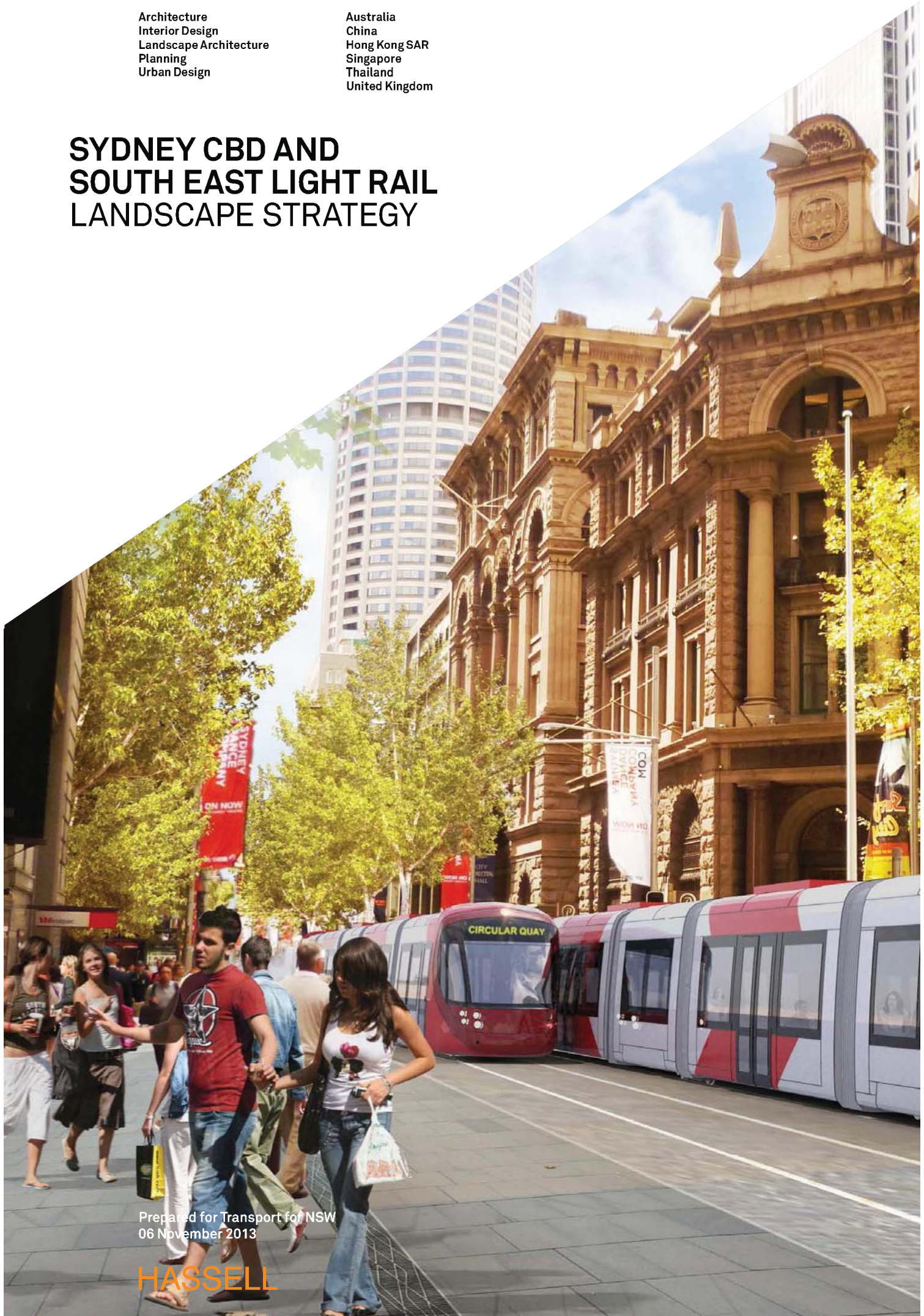
VOLUME 1C

APPENDIX F: LANDSCAPE STRATEGY

Architecture
Interior Design
Landscape Architecture
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SYDNEY CBD AND SOUTH EAST LIGHT RAIL LANDSCAPE STRATEGY



Prepared for Transport for NSW
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HASSELL

Report	Revision	Date
Appendix A_Landscape Strategy	Final	06.11.13

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Front cover image: Artist's impression of George Street,
by HASSELL

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

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Introduction



00 Introduction

Introduction

This report has been prepared by HASSELL to provide a high level Landscape Strategy as part of the mitigation of impacts associated with the CBD and South East Light Rail (CSELR) project for the NSW Government. During the EIS process it has become evident there is a need for a distinct landscape strategy to support the wider objectives of the project as well as the CSELR urban design strategies.

In particular there will be significant impacts to trees along the corridor. To ensure the losses are adequately offset, mitigation of these impacts will be provided by a strategic landscape strategy.

The scope of this report is to provide an overarching landscape strategy, developed in collaboration with the Urban Design Vision, Principles and Objectives, for the landscape of the corridor from Circular Quay to Central, and Central to Kingsford and Randwick.

This report has been developed with the wider Environmental Impact Statement (EIS), Transport for NSW (TfNSW) and CSELR Urban Design team to form part of the overall CSELR project.

Works to date

Works to date which have influenced the landscape strategy have included:

- _ Integration of the City of Sydney's George Street Concept Plan
- _ Collaboration with the City of Sydney on 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 City of Sydney and Randwick City Council consultation – however concepts for landscape treatments have not been discussed in detail
- _ The Moore Park alignment incorporates a tunnel across the playing fields, maintaining the existing recreational uses with minimal long term impact to the playing fields
- _ The Moore Park stop design at grade minimises the impact 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 (between Alison Road and Kingsford) to ensure equity of access from both sides of the street, and where possible consider landscape treatments in the central median
- _ Developing a strong light rail stop strategy to ensure light rail visibility to customers
- _ An integrated urban design strategy to mitigate the impacts of the new infrastructure associated with the light rail - the tracks, wires, poles etc.
- _ A landscape strategy to mitigate the impacts as a result of the loss of existing trees
- _ Identified other significant landscape losses additional to the tree losses i.e. views, habitat, cultural significance, residential values which need to be addressed in the next stage (concept design)

Glossary

AFL - Australian Football League
CSELR - CBD and South East Light Rail
CoS - City of Sydney
EIS - Environmental Impact Statement
TfNSW - Transport for NSW

Background



‘Any place that you can get to by jet is unlikely to be very different from the place you just left.’

George Seddon
1979

George Seddon, the well respected geologist and landscape commentator said this in 1979 – long before the internet and long before the world discovered itself and people travelled en masse, taking their own versions of beauty and aesthetics with them.

He wrote that cities in tropical climates up until the 1950’s were remarkable by their trees – like their architecture, their urban form, and their topography. It mattered, he posed, that we ought to celebrate differences in our places not only in cultures and language, but also the ecological, the aesthetic and the psychological. He wrote that understanding the geology, understanding the landform, respecting the soil, respecting the hydrology, respecting the natural vegetation and appreciating the cultural landscape reveals the character of a place.

Sydney is a place of trees, great streets, parks, harbour front reserves, recreational ovals and people’s backyards.

Therefore the CSELR landscape strategy begins with an understanding of Sydney’s landscape in the city, the inner west, the inner east and inner south. Revealing, analysing and understanding Sydney’s landforms, vegetation, geology, drainage and current landscape will assist avoiding Seddon’s rather depressing tone on the ubiquitousness of the world landscape.

The CSELR corridor has a range of diverse, interesting and local characters – indeed Robert Lee notes in his book ‘Transport’ that Sydney’s diverse landscape created a network of tram corridors (before their removal in 1961) unlike anywhere else on earth – due in large to Sydney’s landscape – through sandstone cuttings, down steep embankments, to ocean side beaches, along ridge lines, on headlands and in harbour side suburbs.

The analysis provides an understanding of any impact a new transport system will have and what opportunities and benefits it might provide.

01 Background

1.1 Understanding Sydney's Landscape Diversity

The Sydney basin has one of the most diverse landscapes in Australia.

D. Benson & J. Howell in their book 'Taken for Granted' describes Sydney's pre-European landscape as a diverse pattern of forests, woodlands, heaths, scrub, sedge lands and swamps. These patterns were a response to the variety of soils and rock types that are found within the Sydney basin.

We have mapped the following natural factors and influences as part of understanding Sydney's landscape:

- _ Geology
- _ Pre-European Landscape
- _ Topography
- _ Hydrology and Drainage
- _ Local Government areas
- _ Street Tree and Landscape policies and master plans



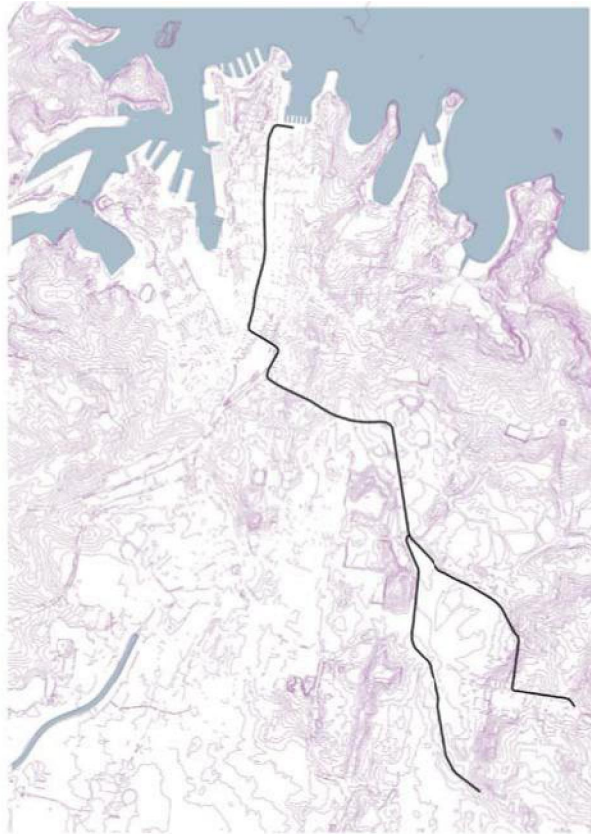
Sydney's Geology

- 1 Hawkesbury Sandstone - shallow sandy soils
- 2 Shale - clay soils
- 3 Quartz Sand - deep sand soils





Sydney's Pre-european Vegetation



Sydney's Topography

- 1 Turpentine-Ironbark Forest
- 2 Woodland on Sandstone
- 3 Heath on Sandstone
- 4 Freshwater Swamp
- 5 Eastern Suburbs Banksia Scrub
- 6 Mangrove swamp



01 Background

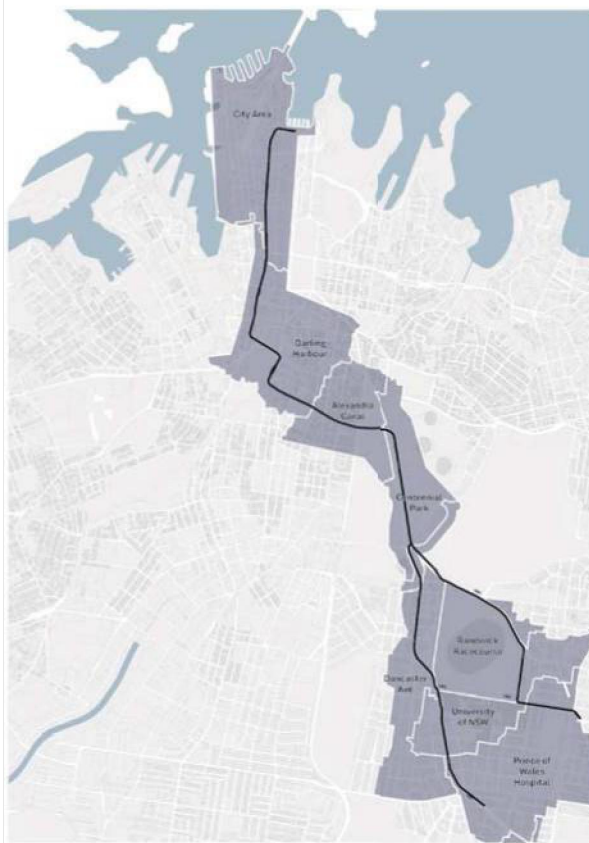
As Seddon states, 'understanding our landscape is one thing, interpreting it is another'.

The natural forces underlying Sydney's former and current landscape character shows that geology, landform, soil and drainage are critical in forming a landscape response and celebrating what makes Sydney's character so prevalent.

This isn't just limited to street trees, although in a tight inner city environment trees often are the prevailing natural factor apart from views and landform.

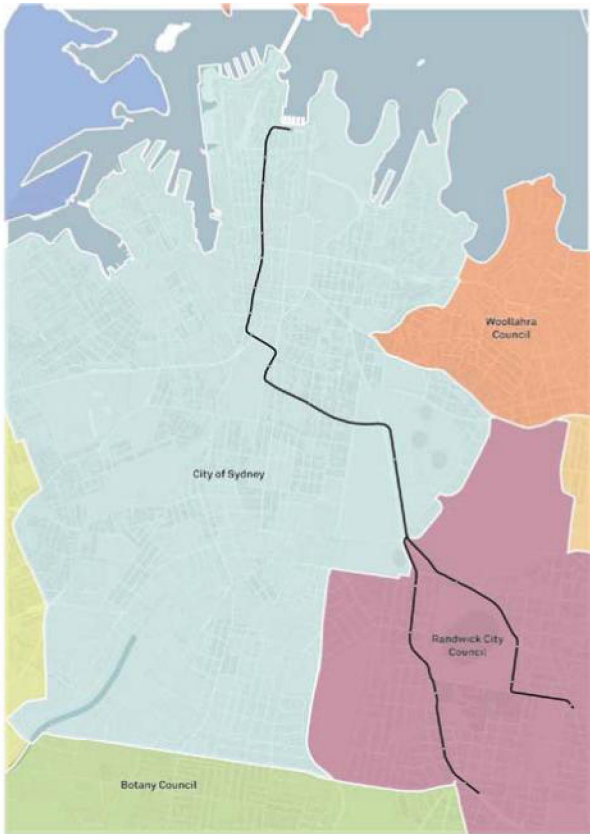
Nevertheless one does inform the other and almost all of the current character is cultural, not remnant or natural.

Our analysis provides the basis from which our Landscape Strategy can be developed to work with the Street Tree and Landscape Master Plans of the City of Sydney, Sydney Harbour Foreshore Authority, Randwick City Council, and the Centennial Park and Moore Park Trusts who manage and look after the large majority of Sydney's green space.

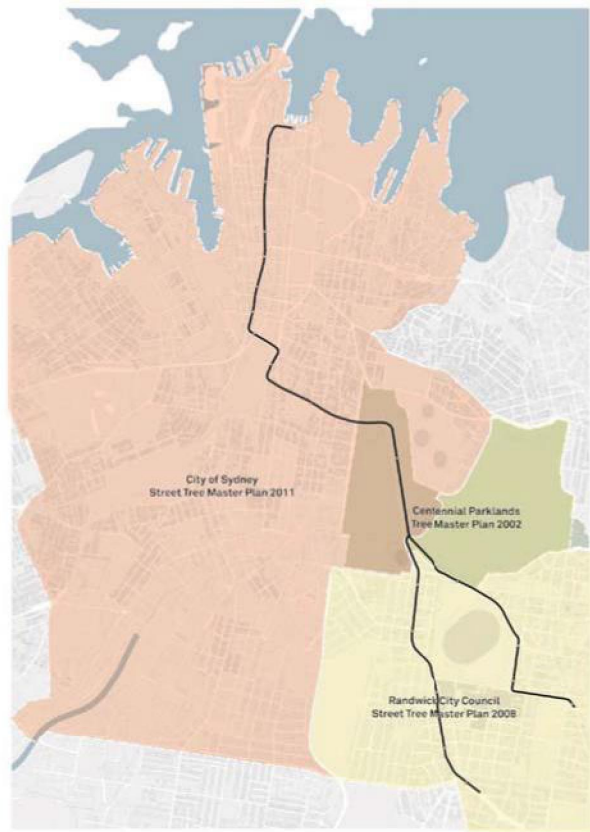


Sydney's current Stormwater Drainage Catchments





Local Government Areas



Related Street Tree Masterplans



02 A Vision for Light Rail in Sydney



Aerial view of Sydney showing the proposed light rail route (light-green) and existing light rail (blue)

02 A Vision for Light Rail in Sydney

The CSELR urban design has been focussed on creating a strong narrative for the designed elements of the project. This has included developing the route alignment, developing stop design concepts and interchange designs, refining the 'base case', working with stakeholders on strategic and relevant urban design issues and challenges, as well as generally refining many other aspects of the project.

The CSELR urban design principles and supporting objectives are based on Transport for NSW's key drivers. The Landscape Strategy forms a key part of the CSELR Urban Design Principles developed for the project,

The CSELR project has developed an overall CSELR Urban Design Vision, which has guided the development of the Urban Design Strategies through the Feasibility Design, Scoping Design and Definition Design stages. The CSELR Urban Design Vision is as follows:

2.1 A Renaissance in Sydney's Transport

The renaissance of light rail in Sydney will 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.

2.2 People are the Focus

The light rail will 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 will make 'people' the priority.

2.3 Making New Places

Using a place-based and context-based approach, we have analysed the corridor 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.

2.4 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.

The CSELR project provides a once-in-a-generation opportunity to integrate a new light rail system within our city's rich and fine grain, procuring the next chapter in Sydney's development.

Transport for NSW Objectives

The Transport for NSW objectives provide a renewed focus on public transport in New South Wales, based firmly on people: customers. The success of the project will be determined by its ability to develop an effective transport system and create enhanced places for the future.

To ensure that these key drivers are considered at every stage of the project, key urban design principles have been developed based on these nine Transport for NSW drivers for the CSELR:

1. Provide a transport system that is best able to satisfy the long term customer demand in the Study Area
2. Improve access to the University of NSW, Sydney University and associated hospitals
3. Improve transport for major event venues
4. Reduce surface transport congestion in the CBD
5. Improve the urban amenity within the CBD for workers, visitors and residents
6. Grow public transport patronage and mode share in the Study Area
7. Improve the efficiency and cost effectiveness of the public transport system in the Study Area
8. Serve and stimulate the development of areas of high transport activity and access on the corridors under investigation
9. Optimise the potential for implementation of a feasible solution.

Creating Project Design Drivers

The CSELR urban design team interpreted the TfNSW objectives and simplified these important aspirations to suit an informed urban design process. These were used during the design process and are summarised below.

CSELR Design Aspirations

- The customer experience is the number one priority!
- Be clear about the benefits: what are they, and why are we doing the project?
- Creating something beautiful and making the links with other projects
- How can we help deliver better urban design outcomes for our city?

CSELR Urban Design Principles

The following principles formed the urban design basis of the CSELR project from Feasibility Design, through Scoping Design and Definition Design and continue to provide a robust 'check and balance' mechanism during the EIS process

CSELR Urban Design Principles

01 Focusing on customers

The design of the CSELR should enable the customer to identify with, access easily, and enjoy using the system to ensure that it is part of viable new Light Rail network.

The ultimate success of the Sydney Light Rail should **espouse a focus on the users – people**. Every decision and design element should be viewed through the lens of the user - from where routes and stops are located, how a user identifies with the network, through to the design and tactility of the stops - their look, feel and touch.

Creating a system that people can identify with, access easily, and enjoy using will help to ensure a viable new Sydney Light Rail network.

02

Promote the benefits of light rail

The CSELR will have a big influence on a changing Sydney and should present a clear message to the community so that they can appreciate and understand its benefits.

Our intentions must be clear - **we are striving to create a world class, well defined and well executed project.** There are many different aspects to the project - engineering, light rail systems, urban design, transport planning, integrated land use, impacts on the community and opportunities to create a better city.

Providing a clear understanding using easy to understand language will enable all who come into contact with the project - regardless of the stage - to appreciate and understand the benefits, including the project team, TfNSW, elected members, politicians and **ultimately the people of New South Wales.**

03

Integration of light rail with the community

The CSELR should consider the customers and non-users perspective and experience of light rail to ensure that it is functional without domineering, and that it integrates with the surrounding environment.

People are the focus - passengers as well as others who come across the light rail - from adjacent residents to major stakeholders impacting and benefiting from the infrastructure.

We will **design and resolve the details, as well as the overall look and feel** of the light rail systems to make people want to use it, as well as come back and use it more and leave their cars at home.

04

Delivering for New South Wales

The CSELR must be an integrated and well executed light rail system. It is important to deliver a system that is feasible and within budget and provides a legacy to the people of New South Wales.

Integrated procurement delivers better design outcomes.

We will work to design a system that is feasible and deliverable within budget. We will ensure contractors and government appreciate and understand the importance of building Sydney's future. **We want the project to be a legacy to the people of New South Wales.**

CSELR Landscape Principles



Artists impression of Rawson Place Interchange, by HASSELL.

03 CSELR Landscape Principles

The CSELR project provides the opportunity to create a new 'thread' that traverses the city. It goes beyond a mere transportation mode – creating a dynamic social, economic and environmental lifeline that brings together and celebrates the unique characteristics and identity that is Sydney.

3.1 CSELR Landscape Principles

The CSELR Landscape Principles, therefore, are as follows:

- _The CSELR creates a new 'urban thread' that traverses the city.
- _The CSELR is a 'dynamic' lifeline that brings assembles and celebrates the unique characteristics and identity that is Sydney.
- _The CSELR is a connective element that provides a seamless integration with the city, open spaces, and the harbour.
- _The CSELR is an identifiable icon - something that tells a story not only of Sydney's past, but its future.

3.2 CSELR Landscape Objectives

To achieve the Landscape Principles, the following Landscape objectives have been developed:

- _The CSELR exhibits the unique character of the different light rail routes through the landscape.
- _The CSELR provides a seamless integration with the existing urban plane and open spaces of the city through a contextual and considered landscape palette.
- _The CSELR minimises the impact of the installation of the proposed alignment on the established vegetation of the city wherever possible.
- _The CSELR responds to current Landscape and Street Tree Master Plans along the corridor, as well as the existing landscape character of the area.
- _The landscape principles and objectives (together creating the Landscape Strategy) will need to take account of many varying factors including selection of the right tree type, size and position as well as the safety clearances and other infrastructure requirements.

3.3 CSELR Landscape Strategy

The CSELR Landscape Strategy has been informed by the CSELR Urban Design Principles and helps to improve the look, feel and touch of the required infrastructure elements. The Landscape Strategy benefits passengers, adjacent residents and major stakeholders and the integration of the CSELR project with the surrounding environment. The CSELR landscape strategy helps to achieve a well integrated design outcome and thus a well executed light rail system.

Key principles of the landscape strategy in accordance with the CSELR Urban Design Principles are to minimise and mitigate the visual and ecological impact of the CSELR project and to improve its integration into the surrounding landscape by:

- _screening rail alignments and Stops, particularly adjacent residential houses
- _promoting the use of native tree species in accordance with the street tree master plans of the local authorities to maintain and improve ecological connections
- _retaining the visual character and texture of existing streetscapes where possible by using plant types and species sympathetic to the existing streetscape character
- _providing an improved streetscape through the use of street trees and lower plantings (i.e. George Street)
- _minimising and mitigating the loss of existing trees by considering alternative alignments and adequate tree replacement and compensation plantings to retain or increase the overall number of trees along the alignment
- _enhancing the public open space adjacent to the CSELR project and to develop integrated landscape designs
- _minimising the extent of hard and sealed surfaces
- _using landscape elements like trees for wayfinding purposes and to give spaces a recognisable identity (i.e. palm trees at island platforms along Anzac Parade)

Mitigation of Impacts



Artists impression of Circular Quay Interchange, by HASSELL

04 Mitigation of Impacts

4.0 Planning Measures

The CSELR project has mitigated many of the impacts of the light rail in the planning stages, across a range of measures during the feasibility, scoping and definition design phases.

Planning measures to mitigate the impacts of the CSELR included the following:

- _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 consultation with the City of Sydney and Randwick City Council;
- _Incorporating a tunnel across the Moore Park playing fields maintaining their existing recreational uses;
- _Creating an 'at grade' light rail stop at Moore Park, minimises the loss and impacts of the heritage-listed Fig trees, maintains access to the Sporting stadia as well as the existing AFL training oval;
- _Utilising the central median of Anzac Parade between Alison Road to Bunnerong Road 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 avoiding stops in hard to locate places;
- _Preparing a CSELR Landscape Strategy to mitigate loss of existing trees along the route;
- _An integrated urban design strategy to mitigate the impacts of the new infrastructure associated with the light

rail – the shelters, canopies, ramps, access points, lighting, stop infrastructure, crossings, substations, tracks, wires, poles, and other infrastructure;

- _Considering and analysing the alignment of the route during early planning stages to understand the corridor's character and urban form

The CSELR Urban Design team undertook extensive and comprehensive urban design and landscape analysis of the corridor to provide a solid analytical foundation for the EIS process.

4.1 Mitigation of Impacts

The further mitigation of impacts is based on the following high level strategies in this report:

- _Street Street Strategy
- _Indicative Plant Selection Strategy

These measures are for high level guidance only and are strategic in nature.

Actual solutions (including replanting of street trees) requires further analysis, design and testing to ensure sufficient room and other requirements reflect the relevant standards and guidelines of all stakeholders along the corridor.

Recommendations for additional works are proposed at the end of this report.

CSELR Street Tree Strategy



Aerial view over Moore Park.

05 CSELR Street Tree Strategy

The *CSELR Street Tree Strategy* has been created as part of demonstrating mitigation of the impact of the project, and was informed by the following street tree master plans:

- _ *City of Sydney Street Tree Master Plan* (STMP), 2011, informed the tree species selection for the 'Civic' and 'Civic Village' sections of the proposed track (Sydney CBD and Surry Hills)
- _ *City of Sydney George Street Concept Design*, 2012, informed the tree species selection for the George Street section of the proposed track.
- _ *Tree Master Plan for Centennial Parklands*, 2002, informed the tree species selection for the proposed track section through Moore Park
- _ *Randwick Street Tree Master Plan* (STMP), 1995, informed the tree species selection for the proposed 'Boulevard' section along Anzac Parade and for the 'Park' section to Randwick.

For George Street, the street tree strategy of the *City of Sydney George Street Concept Design* from 2012 replaces the *City of Sydney Street Tree Master Plan* from 2011.

While the City of Sydney's *Street Tree Master Plan* allocates a specific tree species to each street, the *Randwick Street Tree Master Plan* divides the local government area into landscape precincts based on landscape types (i.e. northern swamp valley floor, plateau, etc) and provides existing and proposed species lists for each precinct divided by street hierarchy types. The *Tree Master Plan for Centennial Parklands* describes the main landscape character types and outlines strategies and principles but provides no definitive species lists for each landscape character type.

We have prepared the *CSELR Street Tree Strategy* to incorporate the desires of all master plans along the route and grouped them by precinct, as per the EIS precincts developed for the project.

05 CSELR Street Tree Strategy

LEGEND

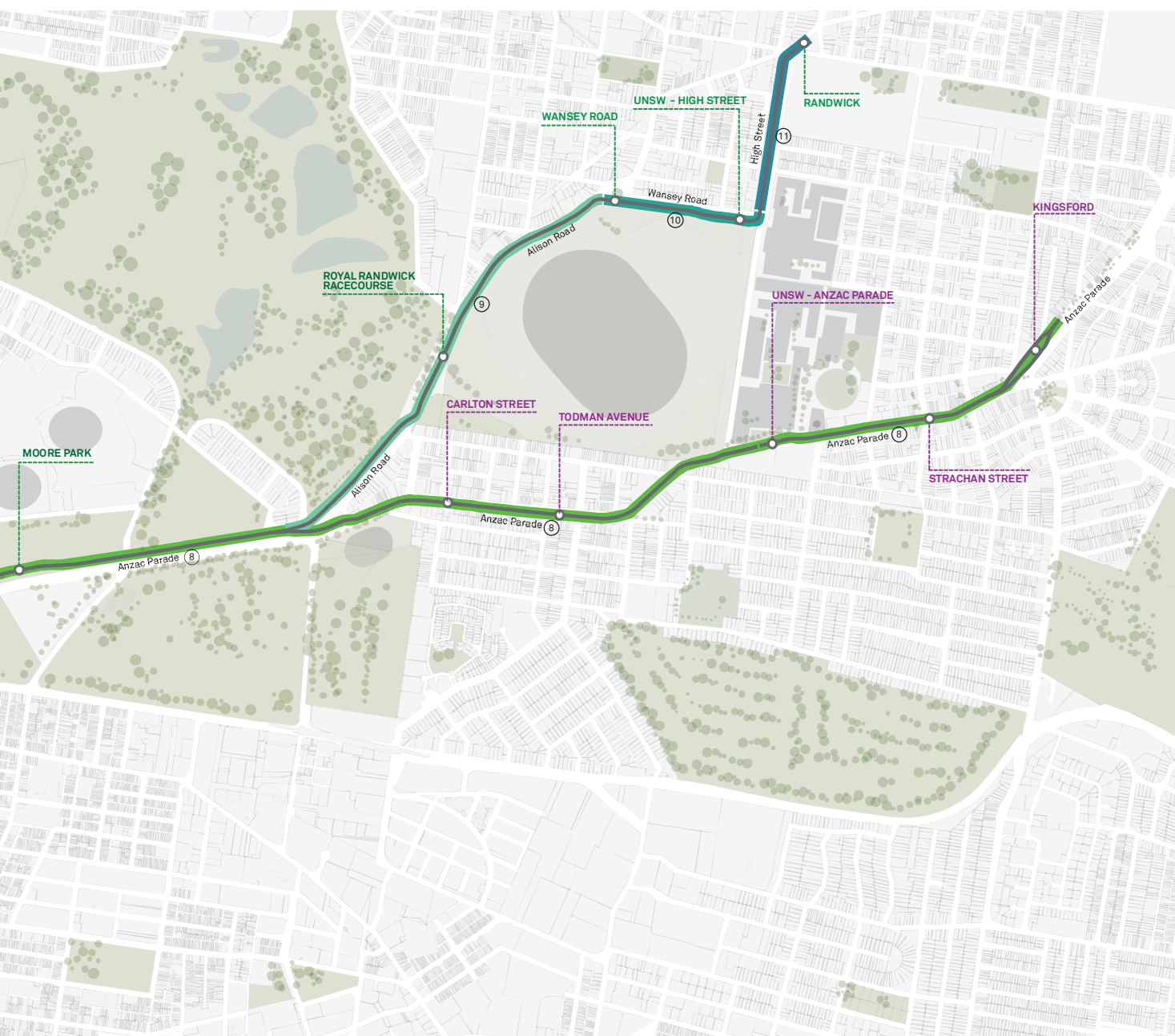
-  Proposed Light Rail Route
- ①a  **Alfred Street** (City of Sydney Street Tree Master Plan, 2011)
_ *Ficus microcarpa* var. *hillii* (Hills Weeping Fig)
- ①b  **George Street** (City of Sydney George Street Concept Design, 2012)
_ *Platanus acerifolia* (London Plane)
_ Alternative species: *Zelkova serrata* (Japanese Zelkova)
- ②  **George Street** (City of Sydney George Street Concept Design, 2012)
_ *Zelkova serrata* (Japanese Zelkova)
- ③  **Rawson Place** (City of Sydney Street Tree Master Plan, 2011)
_ *Lophostemon confertus* (Brush Box)
- ④  **Eddy Avenue** (City of Sydney Street Tree Master Plan, 2011)
_ no trees
- ⑤  **Chalmers Street** (City of Sydney Street Tree Master Plan, 2011)
_ *Platanus acerifolia* (London Plane)

The following plan provides a high level overview of the corridor's CSELR Street Tree Strategy



- ⑥ **Devonshire Street** (City of Sydney Street Tree Master Plan, 2011)
 _*Liriodendron tulipifera* (Tulip Tree)
 _Alternative species: Option 1: *Sapium sebiferum* (Chinese Tallow)
 Option 2: *Celtis australis* (European Nettle Tree)
 Option 3: *Fraxinus oxycarpa* (Claret Ash)
- ⑦ **Moore Park** (Tree Master Plan for Centennial Parklands, 2002)
 “Reinforced parkland character at Moore Park edges with fig species”
 _*Ficus macrophylla* (Moreton Bay Fig)
 _*Ficus microcarpa* var. *hillii* (Hills Fig)
- ⑧ **Anzac Parade** (Randwick Street Tree Master Plan)
 (Northern Swamp - Valley Floor)
 potential species:
 _*Ficus* species
 _*Lophostemon confertus* (Brush Box)
 _Additional Species: *Podocarpus elatus* (Brown Pine)

- ⑨ **Alison Road** (Randwick Street Tree Master Plan)
 Replace existing trees on ATC ground with the same species as the removed tree (*Ficus* sp. and *Platanus* sp.).
 Street Tree Plantings:
 (Northern Swamp - Valley Floor)
 _Option 1: *Corymbia citriodora* (Lemon-scented Gum)
 _Option 2: *Lophostemon confertus* (Brush Box)
 _Alternative species: *Stenocarpus sinuatus* (Flame Tree)
- ⑩ **Wansey Road** (Randwick Street Tree Master Plan)
 Replace existing fig trees on ATC ground with the same species as the removed tree (*Ficus* sp.).
 (Northern Leeward Slopes)
 _Option 1: *Angophora costata* (Smooth-barked Apple)
Eucalyptus haemastoma (Scribbly Gum)
 _Option 2: *Lophostemon confertus* (Brush Box)
 _Alternative species: *Agathis robusta* (Kauri Pine)
- ⑪ **High Street** (Randwick Street Tree Master Plan)
 (Plateau)
 _Option 1: *Corymbia citriodora* (Lemon-scented Gum)
 _Option 2: *Lophostemon confertus* (Brush Box)
 _Alternative species: *Fraxinus oxycarpa* (Claret Ash)
Elaeocarpus eumundi (Native Quandong)



05 CSELR Street Tree Strategy

5.1.1 Alfred Street

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney proposes *Ficus microcarpa* (Hills Weeping Fig) for Alfred Street between Pitt Street and George Street (west end), and between Young Street and Phillip Street (east end) and *Platanus acerifolia* (London Plane) between Pitt Street and Young Street.

Recommendation

- _ 1. Retain *Ficus microcarpa* (Hills Weeping Fig) as per STMP and avoid damage to existing trees during construction
- _ 2. Consider replacing *Platanus acerifolia* (London Plane) with *Zelkova serrata* (Japanese Zelkova) for Alfred Street between Pitt Street and Young Street as this species has been proposed for the entire length of George Street. This will create a visual connection between George Street and Circular Quay, so that the entire section from Central Station to Circular Quay will be read as one line as well as being a more suitable size for Alfred Street.

5.1.2 George Street

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney's *George Street Concept Design* recommends *Zelkova serrata* (Japanese Zelkova) for the entire length of George Street. The City's tree selection was based on independent arboricultural advice.

Recommendation

- _ 1. Retain *Zelkova serrata* (Japanese Zelkova) for George Street
- _ 2. The shape of the species' canopy lends itself to the constraints of a narrow street, confined by infrastructure and built form. It is a deciduous tree with red autumn foliage, providing winter sun and summer shade. It is currently not used in the city and will contribute to the principle of a unique and iconic streetscape.

5.1.3 Rawson Place

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney's STMP proposes *Lophostemon confertus* (Brush Box) for Rawson Place.

Recommendation

- _ 1. Consider alternative species due to constraints of new light rail stop and overhead canopies
- _ 2. Alternative species could include *Zelkova serrata* (Japanese Zelkova) due to their more appropriate size and link to George Street.

5.1.4 Eddy Avenue

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney STMP does not make any recommendations for Eddy Avenue.

Recommendation

- _ 1. Given the very constrained space, no tree plantings are proposed to be accommodated along Eddy Avenue within or immediately adjacent to the light rail alignment
- _ 2. City of Sydney to consider tree species along Belmore Park frontage to Eddy Avenue.

5.1.5 Chalmers Street

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney recommends *Platanus acerifolia* (London Plane) along the eastern side of Chalmers Street only. However, currently Plane trees are planted on both sides of the street.

Recommendation

- _ 1. Retain STMP preference for *Platanus acerifolia* (London Plane) as well as considering alternatives should space constraints require smaller species.

5.1.6 Devonshire Street

Relevant Strategy

City of Sydney *Street Tree Management Plan* (STMP)

The City of Sydney's STMP proposes *Liriodendron tulipifera* (Tulip Tree) for Devonshire Street.

Recommendation

- _ 1. Consider replacement species due to potential large root size and susceptibility to disease, which could damage light rail infrastructure due to close proximity
- 2. Alternative species could include:
 - _ *Sapium sebiferum* (Chinese Tallow) (10-12m high, attractive autumn foliage, shallow non-invasive root system)
 - _ *Celtis australis* (European Nettle Tree) (10-15m high, long-living and resistant to air pollution)
 - _ *Fraxinus oxycarpa* 'Raywood' (Claret Ash) (10-15m high, red autumn foliage)

5.1.7 Moore Park

Relevant Strategy

Centennial Park Trust Tree Management Plan (CPTMP)

The *Tree Management Plan* for recommends reinforcing the parkland character along the edges of Moore Park and South Dowling Street as open grassland and woodland.

This is achieved by using mixed species of Figs to define the corners of Moore Park with landmark plantings consisting of feature trees.

It has been recommended that the edges of Moore Park be characterised by *Ficus macrophylla* (Moreton Bay Fig) and *Ficus microcarpa* var. *hillii* (Hills Fig).

Recommendation

- _ 1. Retain species and approach as identified in TMP

5.1.8 Anzac Parade

Relevant Strategy

Randwick City Council *Street Tree Master Plan* (STMP)

The *Tree Street Master Plan* identifies Anzac Parade as being located in the 'Northern Swamp – Valley Floor' precinct.

It states that Fig trees (species unspecified) and *Lophostemon confertus* (Brush Box) are the existing species currently used in avenue plantings of this precinct.

Recommendation

- _ 1. Retain species and approach as identified in STMP
- 2. Consider alternative species for additional interest and character as *Podocarpus elatus* (Brown Pine) and *Stenocarpus sinuatus* (Flame Tree) as an accent tree species

5.1.9 Alison Road

Relevant Strategy

Randwick City Council *Street Tree Master Plan* (STMP)

The *Tree Street Master Plan* identifies Alison Road as being located in the 'Northern Swamp – Valley Floor' precinct.

Recommendation

- _ 1. Recommend *Corymbia citriodora* (Lemon-scented gum), which the Randwick STMP lists as proposed precinct palette species for main roads.
- _ 2. This would reinforce Alison Road's distinctive character.
- _ 3. Alternative option could be the use of *Lophostemon confertus* (Brush Box).
- _ 4. To further reinforce Alison Road's distinctive character *Stenocarpus sinuatus* (Flame Tree) could be used

The private land of the ATC contains remnant and planted species, predominantly Fig trees of various species and Plane trees. These are not included or referenced as part of the STMP. If some of these existing trees need to be removed, trees of the same species should be planted as replacement close to their original locations to retain the landscape character of the street.

5.1.10 Wansey Road

Relevant Strategy

Randwick City Council *Street Tree Master Plan* (STMP)

The STMP locates Wansey Road in the 'Northern Leeward Slopes' precinct.

Angophora costata (Smooth-barked Apple) and *Eucalyptus haemastoma* (Scribbly gum) are listed as proposed precinct palette species and could be used to continue the native tree character of the 'Park' line to Randwick established with the Lemon-scented Gums along Alison Road. *Lophostemon confertus* (Brush Box) is also a currently used tree species in this precinct and could be the other species option. As an alternative species *Agathis robusta* (Kauri Pine) could be used to give the street a distinctive character.

The private land of the ATC contains remnant and planted species, predominantly Fig trees of various species. These are not included or referenced as part of the STMP. If some of these existing fig trees need to be removed, trees of the same species should be planted as replacement close to their original locations to retain the landscape character of the street.

Recommendation

- _ 1. *Angophora costata* (Smooth-barked Apple) and/or *Eucalyptus haemastoma* (Scribbly gum) along Wansey Street.
- _ 2. Consider ATC Fig trees as part of solution, including mitigating their potential partial removal with replacement Figs where applicable.
- _ 3. Protection of existing Figs on ATC land.

5.1.11 High Street

Relevant Strategy

Randwick City Council *Street Tree Master Plan* (STMP)

The STMP locates Wansey Road in the 'Plateau' precinct.

Corymbia citriodora (Lemon-scented gum) and *Lophostemon confertus* (Brush Box) are listed as proposed precinct palette species and could be used to continue the native tree character of the 'Park' line to Randwick. Alternative species particularly suited for narrow streets such as *Fraxinus oxycarpa* 'Raywood' (Claret Ash) and *Elaeocarpus eumundi* (Native Quandong) should also be considered due to the limited space for street trees in High Street.

Recommendation

- _ 1. *Corymbia citriodora* (Lemon-scented gum) and/or *Lophostemon confertus* (Brush Box) along Wansey Road
- _ 2. *Fraxinus oxycarpa* 'Raywood' (Claret Ash) and/or *Elaeocarpus eumundi* (Native Quandong) should be considered if the available space for street trees is limited.

06 Plant Selection for CSELR Stops, Parks and Landscape Areas along CSELR Corridor

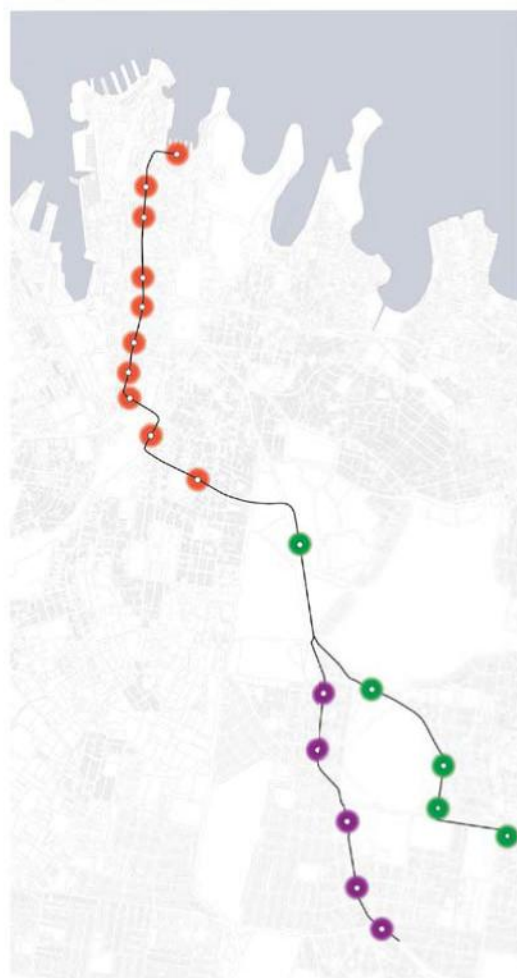
6.0 Plant Selection for CSELR Stops, Parks and Landscape Areas along CSELR Corridor

6.1 Civic Stops

All Civic stops reflecting Sydney's CBD civic character and are integrated into their urban surroundings. Apart from the regular street trees no further plantings are associated with these stops (with the exception of the Chinatown stop which will have some grass plantings included). Refer the CSELR Street Tree Strategy for the tree species of these stops.

Some of the Civic Village Stops will have some low grass and sedge plantings associated with them, either as a narrow strip alongside the stop or as a planted island adjacent to one end of the platform.

The UNSW Anzac Parade stop requires additional consultation with UNSW as the Randwick City Council plans for Anzac Parade are generic for the entire length. as the existing trees are within the UNSW campus and not on public land, further design and consultation is required to ensure replacement planting is aligned with the UNSW Master Plans as well as analysing room for replacement trees.



CSELR Stop Typologies



6.2 Park Stops

The Park stops reflect the character and landscape of Sydney's leisure precinct of Moore Park, Centennial Park, Randwick Racecourse and the Entertainment Quarter. Most of the park stops will have some grass and sedge plantings associated with them. Stormwater from the light rail Park stop's roofs and platforms will drain into these landscape strips.

Indicative Plant Schedule:

GRASSES / TUFTED PLANTS

Dianella caerulea (Blue Flax Lily)
Dianella revoluta (Mauve Flax Lily)
Dichelachne crinita (Long Hair Plum Grass)
Imperata cylindrical (Blady Grass)
Lomandra longifolia (Spiny Mat Rush)
Lomandra multiflora (Many-flowered Mat Rush)
Microlaena stipoides (Weeping Meadow Grass)

SEDGES

Carex appressa (Tall Sedge)
Gahnia clarkei (Sword Sedge)
Juncus usitatus (Common Rush)
Baumea articulata (Jointed Twig Rush)
Baumea rubiginosa (Soft Twig Rush)
Isolepis nodosus (Knobby Club-rush)

GROUNDCOVERS

Trachelospermum jasimonides (Native Jasmin)

LEGEND

- CIVIC Stop - Route A
- CIVIC Village Stop - Route I2
- PARK Stop - Route I2 & O2
- BOULEVARD Stop - Route M

6.3 Boulevard Stops

The Boulevard stops reflect the urban character of Anzac Parade through Kensington and Kingsford. All Boulevard stops are currently proposed as so-called island stops in the centre of the road. Native Cabbage Tree Palms will be planted at one end of the island platform, in the centre of Anzac Parade, serving as highly visual wayfinding markers for most Boulevard Stops.

The UNSW Anzac Parade stop requires additional consultation with UNSW as the Randwick City Council STMP for Anzac Parade covers the entire length. As the existing trees are within the UNSW campus and not on public land, further design and consultation is required to ensure replacement planting is aligned with the UNSW Master Plans as well as analysing room for replacement trees.

Grass and sedge plantings to both ends of the island platforms are proposed for all Boulevard stops. Stormwater from the light rail Boulevard stops roofs and platforms will drain into these landscaped areas.

Indicative Plant Schedule:

TREES

Livistona australis (Cabbage Tree Palm)

GRASSES / TUFTED PLANTS

Dianella caerulea (Blue Flax Lily)

Dianella revoluta (Mauve Flax Lily)

Dichelachne crinita (Long Hair Plume Grass)

Imperata cylindrical (Blady Grass)

Lomandra longifolia (Spiny Mat Rush)

Lomandra multiflora (Many-flowered Mat Rush)

Microlaena stipoides (Weeping Meadow Grass)

SEDGES

Carex appressa (Tall Sedge)

Gahnia clarkei (Sword Sedge)

Juncus usitatus (Common Rush)

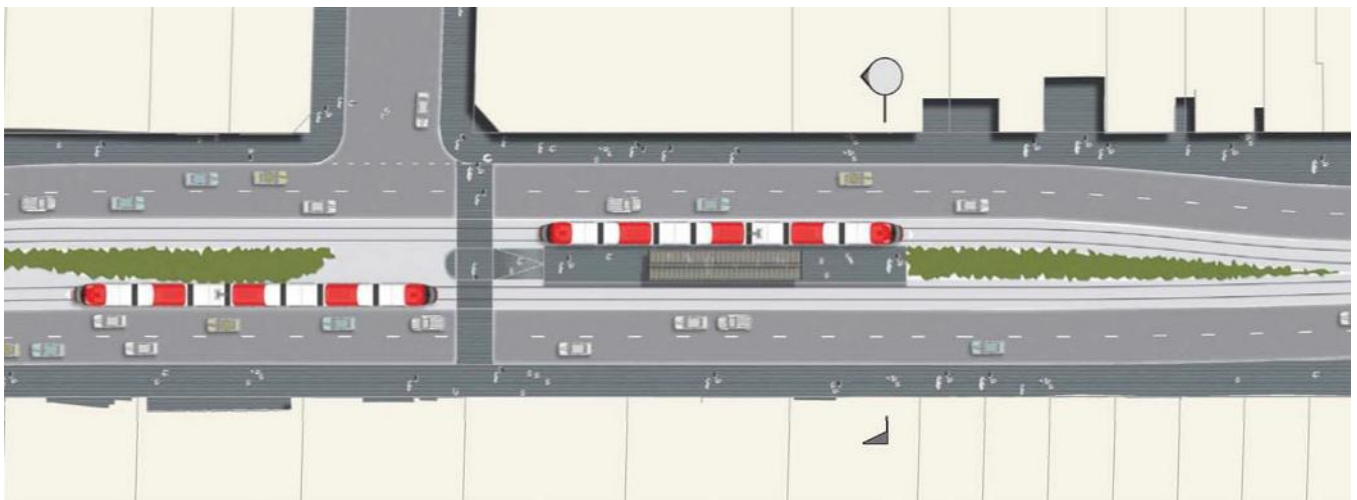
Baumea articulata (Jointed Twig Rush)

Baumea rubiginosa (Soft Twig Rush)

Isolepis nodosus (Knobby Club-rush)

GROUNDCOVERS

Trachelospermum jasimonides (Native Jasmin)



Typical Boulevard Stop with tree planting

06 Plant Selection for CSELR stops, parks and landscape areas along CSELR corridor

6.4 Park on Chalmers Street

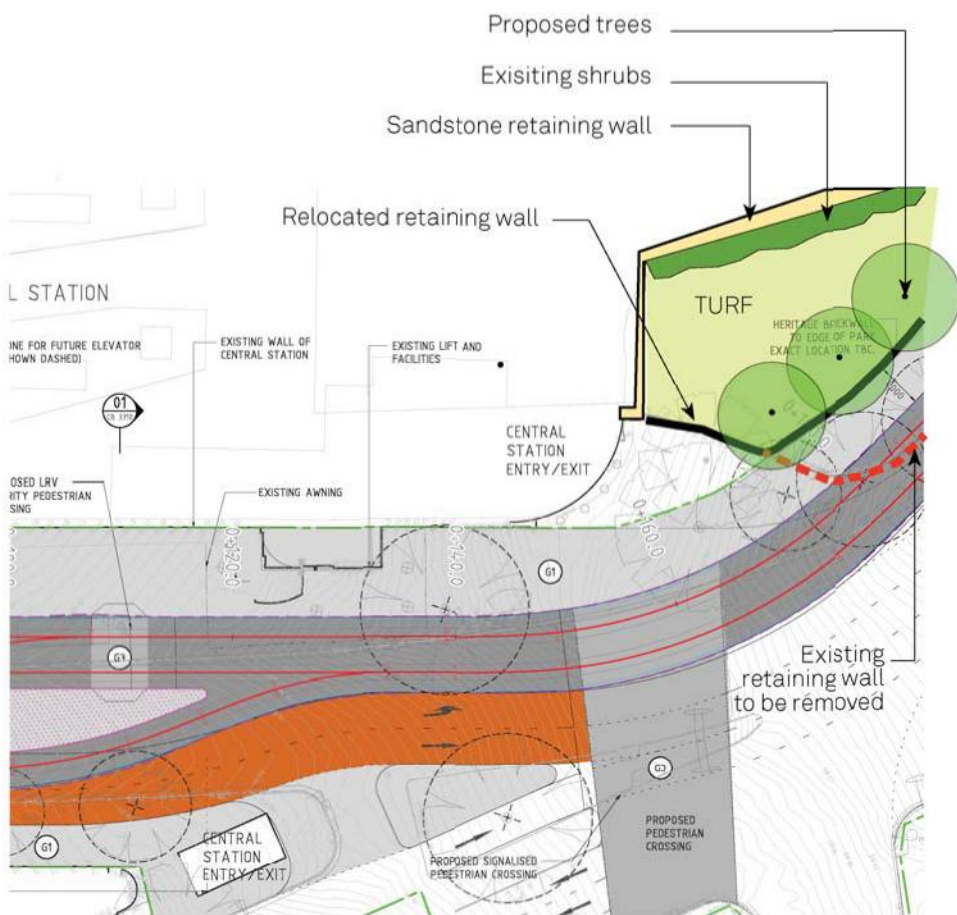
A small historic park is located at the corner of Eddy Avenue and Chalmers Street. The park is confined by an approximately 400mm high heritage listed brick retaining wall. The park can be characterised as a elevated turf area with plane tree plantings in front of the retaining wall on the lower footpath level providing shade, while low to medium high evergreen shrubs screen the historic sandstone retaining wall which supports the heavy rail tracks of Central Station.

The proposed light rail track alignment from Chalmers Street into Eddy Avenue encroaches into the existing park and requires the relocation of the low brick retaining wall which confines the park and the removal of the plane trees along the front of the park.

We suggest retaining the character of the park as a predominant turf area with new plane tree plantings along the edge of the park to provide shade but now within the park and not on the footpath as in the current situation.

Indicative Plant Schedule

- TREES
- Platanus acerifolia* (London Plane)
- Turf (to make good disturbed park areas)



Park on Chalmer Street

6.5 Ward Park, Surry Hills

Approximately 1100m² of Ward Park (including the existing footpaths on Devonshire Street) are required to build the Surry Hills stop.

This includes the loss of a section of the southern footpath in Ward Park of 4.0m wide footpath for the stop (approx 450m²), relocating the footpath into Ward Park to replace the footpath (approx 650m², to create threshold between park and stop) and the loss of approximately 25-35 trees/large shrubs. The strategy would be to replace all lost trees and shrubs with mature specimens and to remake the edge of Ward Park to the new stop. We are looking at public space gains elsewhere on Devonshire Street including within the proposed alignment through Olivia Gardens to offset the loss of public space.

The design strategy incorporates a new frontage to Devonshire Street for Ward Park to replace the existing landscaped seating area and new tree planting. More detailed concepts will be developed in the next stage in conjunction with the City of Sydney.

The aim is to have no net loss of public space and to achieve a net positive gain, stretched out along the street if required.

The indicative plant schedule reflects the current character of the park and uses the similar tree species for the park.

Indicative Plant Schedule:

TREES

Liriodendron tulipifera (Tulip Tree) - Devonshire Street tree
Jacaranda mimosifolia (Jacaranda) - Park tree
Gleditsia triacanthos 'Sunburst' (Honey Locust) - Park tree

SHRUBS

Syzygium smithii (Lilly Pilly)
Hibbertia aspera (Rough Guinea Flower)
Callistemon citrinus (Crimson Bottlebrush)
Ceratopetalum gummiferum (NSW Christmas Bush)

GROUNDCOVERS / GRASSES

Dianella caerulea (Blue Flax Lily)
Dianella revoluta (Mauve Flax Lily)
Imperata cylindrical (Blady Grass)
Lomandra longifolia (Spiny Mat Rush)
Lomandra multiflora (Many-flowered Mat Rush)
Hypericum japonicum (Matted St John's Wort)

ACCENT PLANTS

Doryanthes excelsa (Gynea Lily)
Crinum pedunculatum (Crinum Lily)
Agapanthus africanus (African Lily)
Strelitzia reginae (Bird of Paradise Plant)
Raphis excelsa (Boadleaf Lady Palm)

Turf (to make good disturbed park areas)



Ward Park, Surry Hills

06 Plant Selection for CSELR stops, parks and landscape areas along CSELR corridor

6.6 Olivia Gardens and Wimbo Park

Wimbo Park and Olivia Gardens has been re-designed as a public park, providing a pedestrian and cycle connection between Devonshire Street and Moore Park, via the new shared cycle/pedestrian bridge over the Eastern Distributor.

The design strategy for Wimbo Park is to provide an urban square facing Bourke Street, with planting around the perimeter to provide open and clear sight lines to the light rail alignment. A wide path connects Wimbo Park, through a new green grassed area, to the new pedestrian and cycle bridge through to Moore Park.

The indicative plant selection, (particularly for the shrubs and accents plants) is inspired by the current lush character of the planter beds of Wimbo Park.

Indicative Plant Schedule:

TREES

Liriodendron tulipifera (Tulip Tree) - Devonshire Street tree

Elaeocarpus reticulatus (Blueberry Ash) - Park tree

Tristania laurina (Water Gum) - Park tree

Allocasuarina littoralis (Black Sheoak) - Park tree

SHRUBS / ACCENT PLANTS

Agapanthus africanus (African Lily)

Clivia miniata (Kaffir lily)

Phormium tennax

Doryanthes excelsa (Gymea Lily)

Crinum pedunculatum (Crinum Lily)

Hibbertia aspera (Rough Guinea Flower)

Syzygium smithii (Lilly Pilly)

Asplenium australasicum (Bird's Nest Fern) - used on site

Raphis excelsa (Boadleaf Lady Palm) - currently used on site

Strelitzia reginae (Bird of Paradise Plant)

Fatsia japonica (Japanes Aralia) - currently used on site

Clivia miniata (Kaffir lily)

GRASSES

Dianella caerulea (Blue Flax Lily)

Dianella revoluta (Mauve Flax Lily)

Lomandra longifolia (Spiny Mat Rush)

Lomandra multiflora (Many-flowered Mat Rush)

Lomandra glauca (Pale Mat Rush)

Microlaena stipoides (Weeping Meadow Grass)

SEDGES

Carex appressa (Tall Sedge)

Juncus usitatus (Common Rush)

Baumea articulata (Jointed Twig Rush)

Baumea rubiginosa (Soft Twig Rush)

Isolepis nodosus (Knobby Club-rush)



Indicative concept for Wimbo Park and Olivia Gardens

6.7 Moore Park West

The existing pedestrian crossing on South Dowling Street will be moved to the light rail crossing point and incorporates a pedestrian crossing.

Some localised regrading will be necessary along South Dowling Street, both along the northbound traffic lanes and southbound traffic lanes, to tie in finished levels of the Eastern Distributor bridge, due to constraints around maintaining existing clearances over the Eastern Distributor, and the required structural depth of the bridge.

The dive structure and portal extends approximately 25m into Moore Park, though the intent in the next design stage will be to minimise this impact on the park by folding up the portal roof structure and mounding the landscape over.

There is a 3m high screen around the portal to prevent unauthorised access into the tunnel.

A connecting path through Moore Park ties into Eastern Distributor shared cycle and pedestrian bridge, and a potential future bridge over Anzac Parade.

The landscape concept for the west section of Moore Park around the proposed dive structure and proposed light rail connection across South Dowling Street retains the existing landscape character by selecting similar plant species to the ones used in Moore Park to screen the tunnel portal and create new pedestrian connections to Surry Hills.

Indicative Plant Schedule:

TREES

Ficus macrophylla (Moreton Bay Fig) - trees along track
Ficus microcarpa var. *hillii* (Hills Fig) - trees along track
Washingtonia robusta (Mexican Fan Palm) - Park tree
Livistona australis (Cabbage Tree Palm) - Park tree
Lophostemon confertus (Brush Box) - Park tree

SHRUBS / ACCENT PLANTS

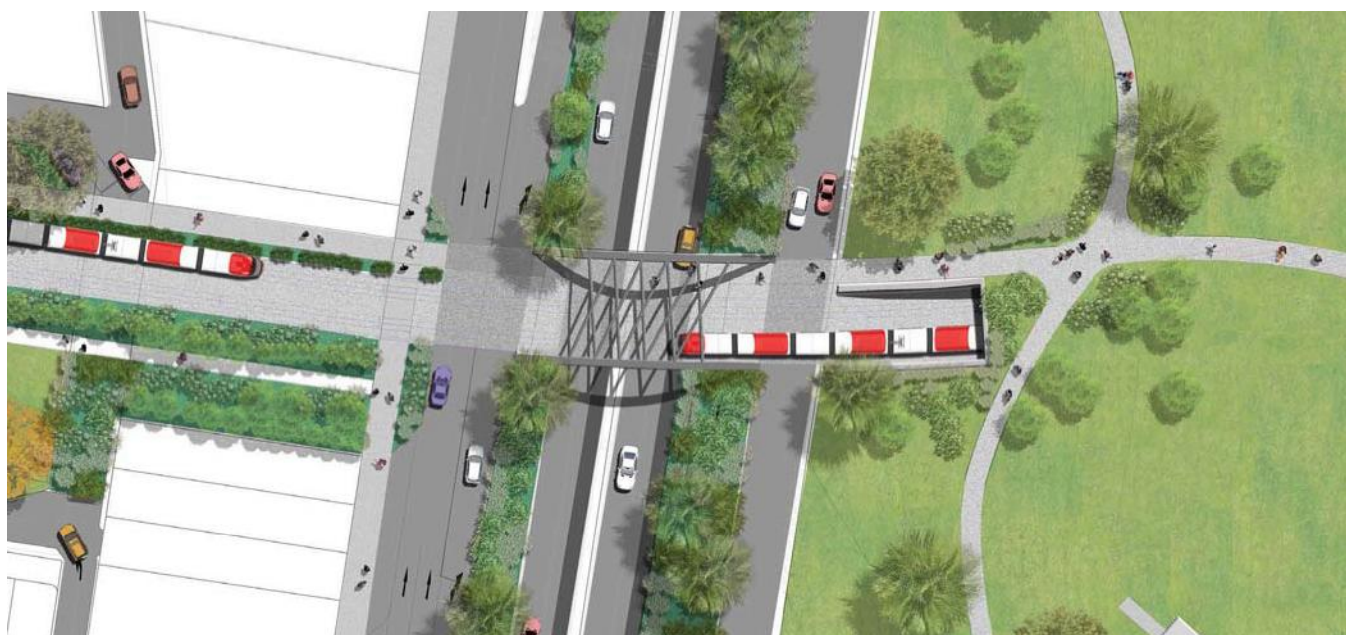
Agapanthus africanus (African Lily)
Clivia miniata (Kaffir Lily)
Phormium tennax
Doryanthes excelsa (Gynea Lily)
Crinum pedunculatum (Crinum Lily)
Hibbertia aspera (Rough Guinea Flower)
Syzygium smithii (Lilly Pilly)

GRASSES

Dianella caerulea (Blue Flax Lily)
Dianella revoluta (Mauve Flax Lily)
Lomandra longifolia (Spiny Mat Rush)
Lomandra multiflora (Many-flowered Mat Rush)
Lomandra glauca (Pale Mat Rush)
Microlaena stipoides (Weeping Meadow Grass)

SEDGES

Carex appressa (Tall Sedge)
Juncus usitatus (Common Rush)
Baumea articulata (Jointed Twig Rush)
Baumea rubiginosa (Soft Twig Rush)
Isolepis nodosus (Knobby Club-rush)



Moore Park West and crossing of Eastern Distributor

06 Plant Selection for CSELR stops, parks and landscape areas along CSELR corridor

6.8 Moore Park East

The Moore Park light rail stop is located adjacent to Anzac Parade within the Moore Park precinct, providing the main interchange for the Moore Park sports and recreational facilities including the Sydney Cricket Ground, the Sydney Football Stadium and the Entertainment Quarter which includes entertainment venues such as the Horden Pavilion.

The key features of the Moore Park stop are:

- _a feature canopy provides shelter over the stop with canopies proposed over pedestrian links
- _stairs and ramps are evenly distributed along the length of the platform for even loading of passengers
- _a new public plaza is located at the north end of the stop to connect walkways, potential bridges and proposed bus services
- _visual connectivity is maintained across the Anzac Road corridor and AFL Training Field

There are mature fig street trees planted along both the eastern and western kerblines to Anzac Parade. A number of figs will be impacted by the construction of cut-and-cover section crossing Anzac Parade.

The landscape strategy proposes to transplant as many of the affected fig trees as possible and feasible. Not all fig trees may be saved by transplanting, particularly the most mature trees are impractical to transplant. We propose to relocate the fig trees in a row along the eastern side of proposed rail tracks which will retain the linear avenue character of the current fig plantings.

Indicative Plant Schedule:

TREES

Ficus macrophylla (Moreton Bay Fig) - trees along track
Ficus microcarpa var. *hillii* (Hills Fig) - trees along track
Washingtonia robusta (Mexican Fan Palm) - Park tree
Livistona australis (Cabbage Tree Palm) - Park tree
Lophostemon confertus (Brush Box) - Park trees

Turf (to make good disturbed park areas)



Moore Park East

6.9 George Dan Reserve at the corner of Wansey Road and Alison Road

The Wansey Road stop is located near the junction of Alison Road and Wansey Road.

There are number of large mature Fig trees on both sides of Wansey Road with over-arching branches that span over the roadway. The proximity of the proposed platforms and overhead wires will need to be tested against some large Fig tree branches to determine the impacts on these trees. If these fig trees can't be retained we recommend to replace the fig trees with native *Angophora costata* (Smooth-barked Apple), *Eucalyptus haemastoma* (Scribbly Gum) or *Lophostemon confertus* (Brush Box) in accordance with our CSELR street tree strategy and Randwick Council's Street Tree Master Plan which states that fig trees should be planted on roads without wires. There might be an opportunity to widen the footpath on the eastern side of Alison Road, pending arborist's advice, which would minimise impact the eastern edge of George Dan Reserve. Our landscape strategy proposes groundcover and grass planting between the widened footpath and Alison Road and making good of the existing turf adjacent to widened footpath.

Indicative Plant Schedule:

TREES

Angophora costata (Smooth-barked Apple)

Eucalyptus haemastoma (Scribbly Gum)
Lophostemon confertus (Brush Box)

GRASSES

Dianella caerulea (Blue Flax Lily)
Dianella revoluta (Mauve Flax Lily)
Lomandra longifolia (Spiny Mat Rush)
Lomandra multiflora (Many-flowered Mat Rush)
Lomandra glauca (Pale Mat Rush)
Microlaena stipoides (Weeping Meadow Grass)
Patersonia sericea (Silky Purple Flag)

SEDGES

Carex appressa (Tall Sedge)
Juncus usitatus (Common Rush)
Baumea articulata (Jointed Twig Rush)
Baumea rubiginosa (Soft Twig Rush)
Isolepis nodosus (Knobby Club-rush)

Turf (to make good disturbed park areas)



George Dan Reserve

06 Plant Selection for CSELR stops, parks and landscape areas along CSELR corridor

6.10 High Cross Park

The Randwick terminus is located within the existing High Cross Park at Randwick and provides a bus interchange with eastern suburbs buses as well as servicing the retail precinct on Belmore Road, the Prince of Wales Hospital and the broader residential area of Randwick and the coastal inner south eastern suburbs.

The side platforms enable improved passenger access to the platforms as well as opportunities to integrate with the existing park – partially offsetting the impact of the proposed interchange (approx 15-20 trees will require removal) with mitigations such as new tree planting, a public plaza and new landscaping. This is an opportunity to create a revitalised High Cross Park that is integrated with Randwick's civic / retail / health precinct. It also provides the opportunity to readdress and provide a civic presence for the existing war memorial, which is a meeting place for annual memorial services on Anzac Day.

The landscape strategy for the park proposes generous paving areas to improve the connectivity to and from the light rail stop and to provide an outdoor dining / cafe area in front of the proposed cafe, integrated into the proposed substation building. The corner of Avoca Street and Cuthill Street will remain a turf area, but raised towards the memorial to accommodate seating steps around the memorial to provide seating opportunities during memorial services and as casual resting spots. Two raised planter beds complete the new park design. New trees, located in the planter beds and turf area,

will provide shade and will compensate for the existing trees which have to be removed for the installation of the light rail stop and connectivity improvements. A further detailed study will be necessary to determine if some of the important existing trees may be retained.

Indicative Plant Schedule:

TREES

Corymbia citriodora (Lemon-scented Gum) - Street tree
Lophostemon confertus (Brush Box) - Street or park tree
Ficus macrophylla (Morton Bay Fig) - Park tree
Ficus rubiginosa (Port Jackson Fig) - Park tree
Tristaniopsis laurina (Water Gum) - Park tree
Agonis flexuosa (Willow-leafed Peppermint Myrtle) - Park tree
Podocarpus elatus (Illawarra Pine) - Park tree
Araucaria heterophylla (Norfolk Island Pine) - Park Tree

SHRUBS

Syzygium smithii (Lilly Pilly)
Banksia spinulosa (Hairpin Banksia)
Banksia marginata (Silver Banksia)
Callistemon citrinus (Crimson Bottlebrush)
Ceratopetalum gummiferum (NSW Christmas Bush)
Correa alba (Coast Correa)
Eriostemon australasius (Pink Wax Flower)
Hibbertia aspera (Rough Guinea Flower)
Kunzea ambigua (Tick Bush)
Leptospermum polygalifolium (Lemon Scented Tea Tree)
Westringia fruticosa (Coast Rosemary)



High Cross Park, Randwick

ACCENT PLANTS

Agapanthus africanus (African Lily) - currently used on site

Raphis excelsa (Boadleaf Lady Palm)

Strelitzia reginae (Bird of Paradise Plant)

Doryanthes excelsa (Gynea Lily)

GRASSES

Dianella caerulea (Blue Flax Lily)

Dianella revoluta (Mauve Flax Lily)

Lomandra longifolia (Spiny Mat Rush)

Lomandra multiflora (Many-flowered Mat Rush)

Lomandra glauca (Pale Mat Rush)

Microlaena stipoides (Weeping Meadow Grass)

Patersonia sericea (Silky Purple Flag)

Recommendations



Proposed Randwick light rail and bus interchange. Image: HASSELL

07 Recommendations

It is recommended that detailed landscape concept plans be developed for the Precincts as part of the CSELR project to further refine and agree the species and landscape approach to the corridor.

This task would need to be completed in collaboration with all the relevant stakeholders.

The proposed scope of works should include the development of a detailed *CSELR Landscape Concept Plan*, with the following components within the CSELR defined project boundary:

- _ street trees - location, species, size, number and planting details;
- _ parks – new planting areas, design, and landscape concepts;
- _ public domain spaces impacted by the CSELR;
- _ developed and 'typical' species list
 - trees, shrubs, groundcovers, sedges and grasses;
- _ surface treatments; and
- _ detailed species lists to be developed for each street, park, public space and/or precinct.

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